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# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

WINTER 1981/2

## Program Report

### Financial Markets and Monetary Economics

Benjamin M. Friedman

The economic events of the past two years have in many respects highlighted the key role played by financial markets in affecting the U.S. economy in important ways. Interest rates on both short- and long-term debt instruments have twice set new record highs during this period and have also displayed unprecedented volatility—so much so that many investors' perceptions of the risk relationships among long-term debt and equity securities appear to be changing. Nor has this unprecedented variation been limited to nominal rates only, as the latest market movements have also severed long-standing relationships between interest rates and price inflation. Conditions in the financial markets, including these market-determined patterns as well as the effects of the Federal Reserve System's application of credit controls in the spring of 1980, no doubt helped to bring about the 1980 recession. The renewed economic downturn that began in 1981, after less than a year of recovery, has again in large part reflected financial market influences. The nation's capital markets have seesawed rapidly between periods of record corporate financing and periods of talk about the "death of the bond market." And just within the past year, the nation's thrift industry has entered a period of massive consolidation, with potentially far-reaching consequences.

At the same time, specific public policy actions have been rapidly changing the institutional structure that shapes the actions of all participants in the financial markets. The radically different pattern of interest rate and asset price behavior during the past two years has clearly stemmed at least in part from the Federal Reserve's new operating procedures adopted in late 1979. The Depository Institutions Deregulation and Monetary Control Act, passed by the Congress in 1980, authorized NOW

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This issue of the *Reporter* highlights the Bureau's Program in Financial Markets and Monetary Economics. Next, Michael Darby and James Lothian discuss their work on the international transmission of inflation, Claudia Goldin describes her historical study of women in the American economy, and Paul Krugman summarizes his research on international trade. After the quarterly Economic Outlook Survey are a section of biographical sketches and news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

accounts on a nationwide basis beginning January 1, 1981, and also altered a number of other aspects of how banks and other financial institutions do business. Subsequent legislative actions, like the authorization of the new tax-exempt "all savers" certificates late last year, have led to rapid changes in patterns of saving flows and asset holding as well. Even the international financial setting has undergone sometimes conflicting changes, as the United States has embarked on a policy of nonintervention in the foreign exchange markets just as some of the nation's major trading partners have instituted the European Monetary System.

These events have stimulated substantial interest and activity on the part of researchers in the Bureau's Pro-

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gram in Financial Markets and Monetary Economics. Participants in the program have investigated these developments as items of interest in themselves and have also used them as opportunities to gain a fresh perspective on long-standing questions about financial behavior and how it affects the nonfinancial economy. Not surprisingly, the past two years have been extremely active ones for research within the program.

#### Debt and Equity Financing of Capital Formation

The largest single project under way within the program continues to be the study of The Changing Roles of Debt and Equity in Financing U.S. Capital Formation, sponsored by the American Council of Life Insurance. With the approach of the 1980s, the Bureau had identified the issue of capital formation as a primary target for empirical economic research. Within that overall research effort, questions about capital formation also seemed to represent a natural direction for the financial markets and monetary economics program. In an advanced economy like that of the United States, with highly developed financial markets, capital formation represents not just the allocation of physical resources but also the allocation of financial resources. Every physical investment decision has its financial counterpart. Moreover, a large body of evidence indicates that these financial allocations do not simply mirror corresponding physical allocations that would take place in any case. The financial and the physical aspects of businesses' and individuals' decisions in this area are fully interdependent, so that the surrounding financial environment importantly affects both the amount and the composition of the capital formation that the economy as a whole undertakes.

Indeed, financial influences on capital formation in the U.S. economy are so many and so pervasive that some more specific focus was necessary for even a major research project. In this context the respective roles of debt and equity in financing capital formation stood out as an aspect of the overall subject that is of particular interest, at least in part because these roles not only appear to have been undergoing some change but also seem likely to evolve further in the future.

The starting point for this research effort was a pair of broad questions about the markets in which the debt and equity securities of business corporations undertaking physical capital formation are issued, traded, and priced: First, how have the markets priced corporate debt and equity securities in the past, and what aspects of the markets' functioning have accounted for these results? Second, how have corporations' financing patterns responded in this environment, and what specific aspects of the interaction between the market mechanism and corporate financing decisions have accounted for these responses?

On April 2-3, 1981, NBER held a conference at Williamsburg, Virginia, at which six of the participants in the first stage of this research presented papers summarizing their findings to an audience of financial market practitioners representing investment management firms, insurance companies, commercial banks, and investment banking firms, and financial officers of corpora-

tions in nonfinancial lines of business. Three of these papers—by Patric Hendershott, Burton Malkiel, and Zvi Bodie—addressed the question of the markets' pricing of securities, while the other three—by John Ciccolo, Martin Feldstein, and Benjamin Friedman—addressed the question of corporations' responses. These six papers, with an introduction summarizing all of the research done within the first stage of the project, are forthcoming in 1982 as an NBER volume entitled *The Changing Roles of Debt and Equity in Financing U.S. Capital Formation*, edited by Benjamin Friedman.<sup>1</sup>

The second stage of the project, involving research more sharply focused on corporate financial capital structures in the United States, is now in progress. Bureau researchers are preparing eleven papers for presentation at a year-end conference, and a subsequent conference volume will make this work also available to a broad audience.

### Interest Rates and Equity Prices

In addition to the specific focus of the project on debt and equity financing of capital formation, within the last two years quite a few participants in the financial markets and monetary economics program have completed research on the determination of interest rates and equity prices more generally, as well as on the effects of interest rates and equity prices on economic activity. Robert Shiller has undertaken a series of studies investigating the volatility of bond yields and equity prices, and exploring the implications of the observed degree of volatility for such questions as how market participants form expectations and whether markets price securities efficiently; James Pesando has also worked on this subject.<sup>2</sup> Although Shiller's work, based on U.S. data, warrants rejecting the joint assumption that markets are efficient and that investors form expectations "rationally," Pesando's results from Canadian data are consistent with the absence of unexploited profit opportunities.

Edward Kane, Patric Hendershott, John Cragg, and Burton Malkiel have studied aspects of the effect of risk

on either interest rates or equity prices.<sup>3</sup> Kane examined cross-section data on interest rate forecasts by market participants and found evidence not only showing the existence of a term premium in the structure of interest rates but also relating the size of that premium to the overall level of interest rates. Hendershott's work concludes that the recent rise of mortgage rates relative to bond rates was due to the effect of increasing interest rate uncertainty on the value of the borrower's ability to prepay a mortgage, in contrast to the call protection features of bonds. In a paper and in their forthcoming NBER monograph, Cragg and Malkiel use survey data on financial analysts' expectations of individual company prospects to provide evidence linking equity prices not just to the systematic risk of a security (as is implied by the standard theory) but to the nonsystematic risk as well.

Phillip Cagan and David Jones have investigated the effects of inflation on equity prices, Cagan by using microdata for individual corporations' earnings and stock prices, and Jones by using a semiaggregated model of investors' demands for equity securities.<sup>4</sup> Cagan finds that stock prices reflect inflationary effects on earnings via inventory valuations and declining real value of liabilities but not via understated depreciation or capital gains. Jones's results show an overall negative effect of inflation on equity values, lowering the general level of equity prices by 7.8 percent for every 1 percent of inflation.

Vance Roley and Benjamin Friedman have used similar approaches to Jones's to investigate the effects of federal debt management and, in Friedman's case, to analyze the consequences of shifts in individuals' saving flows into pension funds and away from life insurance and thrift deposits.<sup>5</sup> Roley finds that debt management has sizable effects on interest rates as well as equity prices. In addition, Friedman finds that debt management affects both the size of nonfinancial spending and the amount of that spending devoted to capital formation, and also that shifting saving patterns have analogous effects.

David Hartman, in two papers, examines international effects on U.S. interest rates.<sup>6</sup> Hartman's results docu-

<sup>1</sup>The six papers are: P. Hendershott, "Inflation, Resource Utilization, and Debt and Equity Returns," NBER Working Paper No. 699, June 1981; Z. Bodie, "Investment Strategy in an Inflationary Environment," NBER Working Paper No. 700, June 1981; B. Malkiel, "Risk and Return: A New Look," NBER Working Paper No. 701, June 1981; J. Ciccolo, "Changing Balance Sheet Relationships in the U.S. Manufacturing Sector, 1926-77," NBER Working Paper No. 702, June 1981; M. Feldstein, "Private Pensions as Corporate Debt," NBER Working Paper No. 703, June 1981; and B. Friedman, "Debt and Economic Activity in the United States," NBER Working Paper No. 704, June 1981.

<sup>2</sup>R. Shiller, "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" NBER Working Paper No. 456, March 1980, "Alternative Tests of Rational Expectations Models: The Case of the Term Structure," NBER Working Paper No. 563, October 1980, and "The Use of Volatility Measures in Assessing Market Efficiency," NBER Working Paper No. 565, October 1980; with S. Grossman, "The Determinants of the Variability of Stock Market Prices," NBER Working Paper No. 564, October 1980; and J. Pesando, "On Expectations, Term Premiums, and the Volatility of Long-Term Interest Rates," NBER Working Paper No. 595, December 1980.

<sup>3</sup>E. Kane, "Nested Tests of Alternative Term-Structure Theories," NBER Working Paper No. 639, March 1981; P. Hendershott and K. Villani, "The Terminations Premium in Mortgage Coupon Rates: Evidence on the Integration of Mortgage and Bond Markets," NBER Working Paper No. 738, August 1981; and B. Malkiel and J. Cragg, "Expectations and the Value of Shares," NBER Working Paper No. 471, April 1980.

<sup>4</sup>P. Cagan, "The Relation of Stock Prices to Corporate Earnings Adjusted for Inflation," NBER Working Paper No. 525, August 1980; and D. Jones, "Expected Inflation and Equity Prices: A Structural Econometric Approach," NBER Working Paper No. 542, September 1980.

<sup>5</sup>V. Roley, "The Effect of Federal Debt Management on Corporate Bond and Equity Yields," NBER Working Paper No. 586, December 1980; and B. Friedman, "Debt Management Policy, Interest Rates, and Economic Activity," NBER Working Paper No. 839, December 1981, and "The Effects of Shifting Saving Patterns on Interest Rates and Economic Activity," NBER Working Paper No. 587, December 1980.

<sup>6</sup>D. Hartman, "International Effects on U.S. Capital Markets," NBER Working Paper No. 581, November 1980, and "The International Financial Market and U.S. Interest Rates," NBER Working Paper No. 598, December 1980.

ment significant influences on U.S. interest rates due to international capital flows as well as Eurodollar interest rates (and, similarly, significant effects of U.S. rates on Eurodollar rates).

### Corporate Balance Sheets, Earnings, and Asset Values

Questions about corporate financial structure, especially under conditions of rapid and volatile inflation, have also attracted the attention of three of the program's participants. Robert Taggart, in a series of papers, investigates several issues in corporate finance.<sup>7</sup> In two papers Taggart explores the implications of the divergence between the interest rates at which corporations are able to borrow and lend, first showing that this divergence, in conjunction with the tax treatment of debt, induces lower-cost firms to engage in more debt financing, and then showing that there are incentives for firms to pursue specific debt-equity financing strategies even in the absence of taxes. Taggart's other work along these lines analyzes patterns of post-World War II corporate financing, showing that current debt levels are at a postwar peak but nonetheless are not unprecedented within the entire twentieth century. Taggart also analyzes commercial banks' decisions about their capital structure, showing why banks choose to be so highly levered (relative to nonfinancial firms) and why bank leverage has been increasing over time.

Martin Feldstein and Benjamin Friedman have also done research on issues in corporate financing.<sup>8</sup> Feldstein's work shows that allowing for the effect of state and local taxes makes important changes in earlier estimates of the return to capital in the U.S. corporate sector as well as estimates of the rate of taxation on that return, so that effective tax rates turn out to have risen especially rapidly during the 1974-79 period. In another paper Feldstein shows that, because the market price of a firm's equity securities fully reflects the funding status of its pension plan, "underfunding" of corporate pensions does not lower total national saving. Friedman's work examines the problems associated with increasing the U.S. economy's low (and falling) rate of net capital formation and identifies the large (and rising) federal budget deficit as a major focus of concern.

<sup>7</sup>R. Taggart, "Taxes and Corporate Capital Structure in an Incomplete Market," NBER Working Paper No. 594, December 1980, and "Secular Patterns in Corporate Finance," NBER Working Paper No. 810, December 1981; with Y. Orgler, "Implications of Corporate Capital Structure Theory for Banking Institutions," NBER Working Paper No. 737, August 1981; and with L. Senbet, "Capital Structure Equilibrium under Incomplete Market Conditions," NBER Working Paper No. 747, September 1981.

<sup>8</sup>M. Feldstein, J. Poterba, and L. Dicks-Mireaux, "The Effective Tax Rate and the Pretax Rate of Return," NBER Working Paper No. 740, August 1981; Feldstein and S. Seligman, "Pension Funding, Share Prices, and National Saving," NBER Working Paper No. 509, July 1980; and B. Friedman, "Financing Capital Formation in the 1980s: Issues for Public Policy," NBER Working Paper No. 745, September 1981.

### The Role of Monetary Aggregates In Monetary Policy

Monetary policy has traditionally been a central focus of research in this area, and recent developments have attracted widespread interest in the role played by monetary aggregates in the design and implementation of monetary policy. Several of the program's participants have recently done research on this set of issues. John Makin and Benjamin Friedman have investigated the relationship between movements of monetary aggregates (and, in Friedman's work, debt aggregates) and nonfinancial economic activity.<sup>9</sup> Makin's empirical results show that, in contrast to recent theoretical arguments that only the unanticipated component of money growth should affect real economic activity, in the United States anticipated money growth consistently affects real growth and employment, while unanticipated money growth has no such effects. Friedman's results show that the relationship between the total outstanding indebtedness of all nonfinancial borrowers in the United States bears just as stable a relationship to U.S. nonfinancial economic activity as does the money stock (however measured) or the monetary base. In another paper, Friedman shows that these results are not due to any simple causal chain whereby money "causes" income while income in turn "causes" debt.

Charles Freedman, in two papers, examines the problems associated with implementing a monetary aggregates policy.<sup>10</sup> His work highlights the importance of different criteria for selecting a monetary aggregate as a policy target and also shows that, in a system with either institutional lags (lagged reserve accounting, for example) or structural economic lags, the central bank's use of the monetary base as the instrument with which it seeks to control its policy target may entail sharp—and possibly explosive—oscillations of short-term interest rates.

Milton Friedman and Anna Schwartz, in their forthcoming NBER monograph, investigate the interrelationships among monetary aggregates and several other measures of financial and nonfinancial economic activity.<sup>11</sup> Their analysis spans more than a century and encompasses the United States and the United Kingdom.

<sup>9</sup>J. Makin, "Anticipated Money, Inflation Uncertainty, and Real Economic Activity," NBER Working Paper No. 760, September 1981; and B. Friedman, "The Relative Stability of Money and Credit 'Velocities' in the United States: Evidence and Some Speculations," NBER Working Paper No. 645, March 1981, and "The Roles of Money and Credit in Macroeconomic Analysis," NBER Working Paper No. 831, December 1981.

<sup>10</sup>C. Freedman, "Some Theoretical Aspects of Base Control," NBER Working Paper No. 650, March 1981, and "Monetary Aggregates as Targets: Some Theoretical Aspects," NBER Working Paper No. 775, September 1981.

<sup>11</sup>M. Friedman and A. Schwartz, *Monetary Trends in the United States and United Kingdom: Their Relation to Income, Prices, and Interest Rates, 1867-1975* (forthcoming from the University of Chicago Press).

## Financial Market Regulation and the Financing of Homebuilding

The regulation of financial institutions, and the closely related question of financing residential investment, are also traditional areas of financial markets and monetary economics research. Two of the program's participants have worked extensively on these topics during the past two years. Edward Kane, in a series of papers, examines both the historical pattern of U.S. banking regulation and the specific implications of recently legislated changes.<sup>12</sup> Kane concludes that the reserve-requirement and pricing-of-services provisions of the 1980 Depository Institutions Deregulation and Monetary Control Act will cause banks to restructure their correspondent banking arrangements and will probably cause the Federal Reserve System to alter its own structure. Kane also concludes that the provisions of the legislation broadening the investment alternatives available to savings and loan associations will eliminate at least part of the cause of the much-publicized bouts of disintermediation that the industry has suffered.

Patric Hendershott, in a further series of papers, focuses on questions relating to housing finance.<sup>13</sup> One of Hendershott's papers leads to conclusions consistent with Kane's, indicating that savings and loans will find corporate debt attractive even when the demand for mortgage funds is strong. In another study Hendershott finds that the standard nonassumable fixed-rate mortgage had been largely responsible for both the sluggishness of housing demand during 1967-74 and the surge in 1976-79, and that housing activity would have been more stable under a financing system relying on variable-rate mortgages.

## Portfolio Behavior

Another traditional line of research in this area is the theory of portfolio behavior, and during the past two years several of the program's participants have worked on this subject. In a series of separate papers and in one joint effort, David Jones and Vance Roley examine the characteristics of the demands for financial assets by

both individual and institutional investors.<sup>14</sup> Jones concludes in one study that movements in two different assets' respective yields would have symmetrical effects on investors' demands for the two assets only if investors were averse to bearing risks in a certain way. Roley then finds that evidence for U.S. investors warranted rejecting the hypothesis of symmetric yield effects, and hence warranted rejecting the associated description of behavior with respect to risk. In further work Jones analyzes the portfolio investment problem from the perspective of institutional investors with decentralized decision-making processes and concludes that managers of components of large institutional portfolios should invest as if they were less averse to risk than the degree of risk aversion that truly characterized their respective institutions.

Carl Walsh, in two papers, studies individuals' portfolio behavior and its implications for interest rate determination. In one paper he shows that the familiar proposition that government deficits unambiguously raise yields on government debt securities holds only if (among other conditions) individuals disregard the inflation risk associated with holding money balances. In the other paper he derives empirical estimates of the patterns according to which U.S. households allocate their saving.<sup>15</sup> In a paper on the same subject but using cross-section rather than time-series data, Edward Kane examines how U.S. households have reallocated their savings in response to the combination of accelerating inflation and regulated deposit interest ceilings.<sup>16</sup> His analysis shows how, both to hedge inflation risk on their nondiscretionary contractual savings and to eke out a positive net aftertax real return on their discretionary savings, all but the wealthiest U.S. households found it advantageous to substitute investments in housing and other real estate, as well as consumer durables and collectibles, in place of traditional saving vehicles such as deposit accounts and savings bonds. By contrast, as a result of differential taxes and transaction costs, the nation's wealthiest households moved on balance out of both traditional deposit accounts and home equity into certificates of deposit, marketable bonds, and equity in investment real estate.

<sup>12</sup>E. Kane, "Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation," NBER Working Paper No. 638, March 1981, "Regulation, Savings and Loan Diversification, and the Flow of Housing Finance," NBER Working Paper No. 640, March 1981, and "Changes in the Provision of Correspondent Banking Services and the Role of Federal Reserve Banks under the DIDMC Act," NBER Working Paper No. 731, August 1981.

<sup>13</sup>P. Hendershott and K. Villani, "Savings and Loan Usage of the Authority to Invest in Corporate Debt," NBER Working Paper No. 725, July 1981, and "Housing Finance in the United States in the Year 2001," NBER Working Paper No. 739, August 1981; and Hendershott and S. Hu, "Accelerating Inflation, Nonassumable Fixed-Rate Mortgages, and Consumer Choice and Welfare," NBER Working Paper No. 755, September 1981.

<sup>14</sup>D. Jones, "Consistent Simple Sum Aggregation over Assets," NBER Working Paper No. 573, October 1980, "Symmetric Substitution Matrices in Asset Demand Systems," NBER Working Paper No. 574, October 1980, and "The Efficiency of Decentralized Investment Management Systems," NBER Working Paper No. 719, July 1981; V. Roley, "Symmetry Restrictions in a System of Financial Asset Demands: A Theoretical and Empirical Analysis," NBER Working Paper No. 593, December 1980; and Jones and Roley, "Bliss Points in Mean-Variance Portfolio Models," NBER Technical Working Paper No. 19, December 1981.

<sup>15</sup>C. Walsh, "Asset Prices, Substitution Effects, and the Impact of Changes in Asset Stocks," NBER Working Paper No. 566, October 1980, and "Measurement Error and the Flow of Funds Accounts: Estimates of Household Asset Demand Equations," NBER Working Paper No. 732, August 1981.

<sup>16</sup>E. Kane, "Accelerating Inflation and the Distribution of Household Saving Incentives," NBER Working Paper No. 470, April 1980.

Robert Shiller also studies households' portfolio behavior, considering it in the specific context of households' consumption plans.<sup>17</sup> Shiller finds that familiar propositions relating an asset's market-determined yield to only the systematic component of its risk would still be valid even if, for example, investors disagreed about the range of possible outcomes, or investors held assets that were not readily tradable.

### Research on Other Subjects

Finally, in addition to those broad areas that attracted related efforts from several researchers, some participants in the program conducted individual research on still other subjects related to financial markets and monetary economics. John Makin worked on the behavior of international exchange rates and capital flows, concluding that much of the variation of exchange rates reflects the receipt of unsystematic information by asset markets and that capital flows into and out of the United States respond with persistent although damped oscillations to changes in U.S. money growth relative to nonfinancial economic growth.<sup>18</sup> Wilbur Lewellen and Gary Schlarbaum continue their research on investment recommendations provided by retail brokerage firms and find evidence indicating that such recommendations do provide opportunities for investors to realize superior returns.<sup>19</sup> Stanley Fischer examines the effects of indexation of wage rates, bond coupons, and taxes on the relative inflationary impact of the 1974 oil price increase in forty countries and concludes that indexation in general did not increase the inflationary impact, although the impact was significantly stronger in those countries that had adopted bond indexation.<sup>20</sup> And, as a part of the Bureau's Project on The American Economy in Transition, Benjamin Friedman undertook a historical review of the overall development of the U.S. financial markets since World War II.<sup>21</sup>

<sup>17</sup>R. Shiller and S. Grossman, "Consumption Correlation and Risk Measurement in Economies with Nontraded Assets and Heterogeneous Information," NBER Working Paper No. 690, June 1981.

<sup>18</sup>J. Makin, "Exchange Rate Behavior under Full Monetary Equilibrium: An Empirical Analysis," NBER Working Paper No. 647, March 1981, and "International Capital Flows under Full Monetary Equilibrium: An Empirical Analysis," NBER Working Paper No. 648, March 1981.

<sup>19</sup>W. Lewellen, G. Schlarbaum, and K. Stanley, "Further Evidence on the Value of Professional Investment Research," NBER Working Paper No. 536, August 1980.

<sup>20</sup>S. Fischer, "Indexing and Inflation," NBER Working Paper No. 670, May 1981.

<sup>21</sup>B. Friedman, "Postwar Changes in the American Financial Markets," NBER Working Paper No. 458, March 1980.

## Research Summaries

### The International Transmission of Inflation

Michael R. Darby and James R. Lothian

Two very different views of what caused the inflation of the second half of the 1960s and the 1970s have been widely propounded. On the one hand, there are those who stress the role of special factors: the monopoly power of the business sector and of trade unions; the substantial rise in commodity prices in 1973; and, most important, the OPEC-induced increases in the price of petroleum in 1973-74. On the other hand, some observers regard inflation in general as a monetary phenomenon and this particular episode as just another member of the species. According to most proponents of this view, the United States played a key role in the process: its excessive monetary growth was exported abroad via the fixed-exchange-rate system formally in existence until 1973.

With Arthur E. Gandolfi, Anna J. Schwartz, and Alan C. Stockman, we have completed a study of this question and the related question of how inflation was transmitted among countries during the Bretton Woods era.<sup>1</sup> It is impossible in this short space to provide a full summary of all this research. Instead we hope to whet readers' appetites by a statement of what we have learned.

A major effort directed by Lothian resulted in the creation of a consistent quarterly data base for 1955-76 for the United States, United Kingdom, Canada, France, Germany, Italy, Japan, and the Netherlands. These dates and countries delimit, with few exceptions, the range of the study.

The evidence of the study lends very little support to the special-factor explanation of inflation. We found that at most it can account for only a minor fraction of the inflation during 1957-76. Monetary factors explain the bulk.

Cassese and Lothian conducted a series of tests based on the timing relationship between money and prices. Under the trade-union and monopoly power hypotheses, money is purely passive: increases in inflation either precede and give rise to increases in monetary growth or are unrelated to monetary growth. Cassese and Lothian found the opposite: that monetary growth leads inflation and has a statistically significant effect on it. In contrast, the oil-shock hypothesis receives some, albeit limited,

<sup>1</sup>The draft volume, *The International Transmission of Inflation*, by Michael R. Darby, James R. Lothian, Arthur E. Gandolfi, Anna J. Schwartz, and Alan C. Stockman contains seventeen individually or jointly authored chapters and a Data Appendix. In addition to the main authors, individual chapters were contributed in whole or part by Daniel Laskar, Dan Lee, Michael Melvin, and Anthony Cassese. We plan to make the data base and Mark III Models publicly available.

support: increased oil prices can affect the general price level either by decreasing the real quantity of money demanded or by increasing the nominal quantity of money supplied. Some substantial effects of oil prices on real output (and hence money demanded) are estimated by Darby, but they may be due instead to coincidental removal of general price controls. Allowing for money-supply effects in the simultaneous model developed by Darby and Stockman yields a total price level effect of the 1973-74 oil shock ranging from 0 to 5 percent. Thus the oil shock accounts at most for 1 percentage point of the 3.5 percentage point increase in the average 1971-75 inflation rate over 1966-70. Gandolfi and Lothian investigated reduced-form price equations and obtained qualitatively similar results: generally significant but small oil-price effects and generally negligible and insignificant basic-commodity-price effects.

If accelerating money growth was the major cause of accelerating inflation, the next question is whether the United States was the cause or simply another victim of this international phenomenon. Here the evidence strongly supports the view that the United States, as the reserve-currency country, was the prime cause of the world inflation and not itself a victim.

First, the evidence supports the view that international factors played little if any role in determining U.S. money growth over substantial periods of time. Darby was unable to find any significant effect of the balance of payments in the Federal Reserve's money-supply reaction function regardless of the definition of the balance or the subperiod examined. Cassese and Lothian found that variations in U.S. money growth were a cause of U.S. balance-of-payments flows. Gandolfi and Lothian's expected money-growth equations indicate that the balance of payments (or U.S. money growth) affected domestic money growth in the other seven countries, but not in the United States.

Second, U.S. growth in real money demanded—although responsive to money and other shocks in the short run—is very stable over longer periods. Indeed for four-year averages, variations in nominal money growth explain some 97 percent of the variation in postwar U.S. inflation. Thus the acceleration in the trend rate of U.S. inflation can be viewed as essentially homegrown and not international in origin.

We also amassed a substantial body of evidence on the channels through which inflation was transmitted from the United States to other countries. Not only are these findings of interest in and of themselves but they have a direct bearing on questions of causation, the roles played both by the United States and the various foreign countries. In our statistical analyses, we considered four main channels of transmission: goods substitution, bonds substitution, currency substitution, and absorption effects. We found all of these channels operative to some degree but not so strongly as argued by respective proponents.

Here we briefly describe the first two channels and the relevant statistical findings. The currency-substitution and Keynesian-absorption channels were generally (but

not universally) statistically insignificant in the Mark III Model and will not be considered further here.

In the simplest case in which goods are perfectly substitutable internationally, their prices, when converted to the same currency unit, would be identical. With fixed exchange rates, pressures on U.S. prices engendered by excessive U.S. monetary expansion would be almost instantaneously transmitted to other countries. The result would be an excess demand for money in each foreign country, a balance-of-payments surplus, and hence an expansion in the domestic nominal money supply that occurred after the fact of the price increase. Foreign countries in this situation would play purely passive roles.

We and our colleagues accumulated a variety of evidence that runs counter to this hypothesis: goods are substitutable internationally, but far from perfectly so. The export- and import-price equations in Darby and Stockman's Mark III International Transmission Model indicated an initially small but increasing relative-price effect on the balance of trade. Cassese and Lothian found that growth in domestic money caused price changes rather than the reverse, as indicated by continuous goods arbitrage with money adjusting with a lag. Gandolfi and Lothian were generally unsuccessful in finding an effect of foreign inflation in the reduced-form equations they estimated to explain variations in the domestic inflation rates in the eight countries.

If bonds were perfectly substitutable internationally, monetarily induced variations in U.S. interest rates would have an immediate mirror image in interest rates abroad in a fixed-exchange-rate world. Higher levels of U.S. interest rates that accompanied higher rates of U.S. monetary expansion and inflation would lead to higher levels of interest rates abroad, excess demands for money, greater balance-of-payments inflows, faster monetary growth, and ultimately faster inflation. Again, each foreign country would be a purely passive participant in the inflation process.

We found, however, that assets, like goods, were not perfect substitutes internationally, thus supporting the portfolio-balance approach to international transmission to which Lee and Melvin contributed in this volume. Indirect evidence for this conclusion in the form of actual exercise of monetary control by nonreserve central banks is discussed at length below. More direct evidence is reported by Cassese and Lothian who found that U.S. interest rates affected foreign interest rates over a number of quarters and not simply contemporaneously. Darby and Stockman's capital flow equations indicated a weak effect of expected-depreciation-adjusted interest rate differentials on capital flows.

Monetary control by nonreserve central banks under pegged exchange rates implies an ability to move domestic interest rates and prices relative to their international parity values. So, evidence of monetary control reinforces the direct evidence of imperfectly substitutable assets and goods. The exercise of monetary control is complete or partial according to whether induced reserve flows are completely or partially sterilized.

We and our colleagues have accumulated evidence on three aspects of this larger issue: the prevalence and magnitude of sterilization among our sample of nonreserve countries; the degree of short-run monetary control exercised by these countries under pegged exchange rates; and the implications for dynamic stability of this exercise of short-run monetary control.

Our study reports the results of three separate investigations of sterilization. Although the approaches are diverse, the conclusions are identical: partial or complete sterilization appears to have been a universal practice at least for this set of developed nonreserve countries. Cassese and Lothian reported that past balance-of-payments flows were a cause of current domestic credit growth in all nonreserve countries except Canada. Their finding is consistent with the existence of contemporaneous sterilization and a pattern of lagged adjustment.

Darby and Stockman estimated a uniformly specified nominal-money reaction function for all nonreserve countries in the simultaneous-equation environment of the quarterly Mark III International Transmission Model. Their reaction function for Italy had little explanatory value; for the other six countries, the hypothesis of complete contemporaneous sterilization could be rejected only for Germany and perhaps Japan. Although the contemporaneous effect of the balance of payments on money growth was universally small or nil, lagged responses to the balance of payments ultimately induced a positive relationship in all six countries.

Laskar investigated a number of variants of the Mark III reaction functions using estimation techniques different from those of Darby and Stockman and including the lagged scaled reserve stock as an additional argument. This variable enters positively and eliminates most of the explanatory power of the lagged balance-of-payments terms, but the results are qualitatively the same as Darby and Stockman's while indicating some asymmetric responses to surpluses and deficits and to speculative capital flows.

The most striking conclusion of the monetary approach to the balance of payments was that nonreserve central banks are impotent with respect to their domestic money supplies and interest rates but can attain any desired balance of payments via their actions. Either or both of two assumptions have traditionally been offered to justify this conclusion: goods are perfect substitutes internationally and assets are perfect substitutes internationally. In our volume Darby adds as a third condition expectations of depreciation that are also responsive to variations in the balance of payments.

Since any one of these three conditions—as well as others—preclude monetary control, it is difficult to conclusively reject the impotence of nonreserve central banks with respect to their money supplies. Nonetheless, two types of tests led us to the conclusion that nonreserve central banks did indeed exercise monetary control under pegged exchange rates. First, the direct evidence on the two major conditions for monetary control indicated that neither goods nor assets were perfect substitutes internationally. Second, the evidence was incontrovertible that the actual growth in the money supply was indeed

determined, at least in part, by domestic policy goals.

Four nonreserve countries (United Kingdom, Canada, Germany, and the Netherlands) were examined in some detail in the simulation experiments based on the Mark III Model. Although only Germany displayed strong immediate response to U.S. monetary shocks, all nonreserve money supplies were very responsive to shifts in the domestic money-supply reaction function. Thus the model estimates do indeed imply substantial short-run monetary control.

Laskar dealt with a set of smaller single-country models and found that the offset coefficient (the fraction of an increase in domestic credit offset by contemporaneous capital flows) is significantly less than one. Laskar measured the independence of monetary policy by a scalar that takes account of the extent to which induced capital flows are themselves sterilized. This scalar indicates the fraction of a shift in the money-supply reaction function that will actually be reflected in money growth given the central bank's reaction to the induced balance of payments. Laskar's estimates of the scalar were all significantly different from zero and none was significantly different from one, implying a high degree of monetary independence for all seven nonreserve countries.

Since the results of the Mark III International Transmission Model and Laskar's smaller models could conceivably be due to some omitted channels, a set of relatively model-free tests were also performed. These confirmed the results obtained from the structural models. They rely on the fact that, without short-run monetary control, movements in money-supply-reaction-function variables other than the current balance of payments will be uncorrelated with actual movements in the money supply. Darby, who performed these tests, found the opposite: the growth of the money supply is indeed dependent on these domestic policy variables in all the countries, except perhaps the Netherlands.

The adjustment process under the Bretton Woods System, therefore, had the following salient features: (1) The evolution of American monetary and inflationary trends was determined by domestic factors with international forces playing only a transient role. (2) The proximate determinant of inflation in the nonreserve countries was to be found in their own past money-supply growth. (3) Changes in American money growth did not cause overwhelming capital flows abroad; trade-flow effects built up only as the resulting inflation shifted relative price levels. (4) These balance-of-payments flows had little or no contemporaneous effects on nonreserve money growth, although the cumulative lagged effect could be substantial.

The implied long cumulative lag from an increase in American money growth to an increase in inflation in nonreserve countries can explain the failure of the system. The increase in American inflation at the onset of the 1966-70 period occasioned very little concurrent rise in inflation in the nonreserve countries. As U.S. inflation continued, relative price levels shifted by some 8 percent. And even though nonreserve country money growth rates finally began to rise in response to growing balance-of-payments surpluses, their inflation rates re-

sponded only with an additional lag. The large surpluses of the late 1960s and early 1970s ultimately produced sufficient money growth to surpass American inflation in 1971-75 and offset about half of the 8 percent change in relative price levels that had occurred in 1966-70. However, the surpluses ultimately became sufficiently large to induce speculative capital flows that destroyed the system. Furthermore, a full adjustment would have required an even sharper increase in the average nonreserve inflation rate during the catch-up period.

If the inflation targets of the Federal Reserve System and the nonreserve central banks were in harmony, the lagged adjustment process just described might be equal to the relatively small stress implied by random, once-and-for-all shifts in purchasing-power parities. But as the strong upward trend captured in the American money-supply reaction function brought the United States closer to those countries (Britain and, later, Italy) that preferred faster money growth, it simultaneously moved the United States away from countries such as Germany that preferred a lower rate of inflation. Thus, the incompatible money-supply rules pursued by the reserve and nonreserve central banks put the lagged balance-of-payments adjustment system to a test beyond its power.

To us, the results reported in this study establish beyond doubt the essential monetary nature of the inflation experienced both in the United States and in the seven foreign countries that we and our colleagues investigated. Special factors—oil prices in particular—may have had some impact on the price levels in these countries, but that impact was neither continual nor substantial. Controlling inflation, therefore, reduces to the problem of controlling the nominal stock of money in each of these countries.

While we have shown such control to have been technically possible, central banks were not directed to single-mindedly pursue that goal by any firm constitutional provision establishing a prespecified money-growth path or fixing the exchange rate between money and either a commodity or the currency of a country bound by such a provision. Whether such a provision would be preferable to discretionary authority, although an old debate, is ultimately a political question.

## An Economic History of Women

Claudia Goldin

The contemporary increase in market work for married women and the possible role of the market in generating occupational and wage rate differentials by sex have motivated me to search for historical antecedents. What precipitated the substantial increase in the participation of married women in the labor force? What have been the long-term trends in the labor force participation of both unmarried and married women? Have occupations become more or less segregated by sex, and in what ways have wages differed by sex in the past? My NBER

project explores the impact of economic development on the role of women and will culminate in a monograph, *Economic Change and American Women: An Economic History*.<sup>1</sup> This report summarizes the major issues to be addressed in that book; some of this research has been circulated in the NBER Working Paper series, while much of it is still in progress.

Data on the labor force participation and occupations of women were first collected by U.S. census marshals in 1860 but were not meaningfully tabulated then. The 1890 Federal Population Census is the earliest to have published data on these variables. To explore long-term trends in the economic role of women, data on labor-force participation and occupations, as well as wage rates and educational attainment, must be estimated from surviving documents of various types.

Since much of this project involves the construction of long-term data series from 1790 to the present, a brief description of the historical documents unique to this project seems in order. For the period from 1790 to 1850, *City and Business Directories* and the manuscripts of various censuses of manufactures (1820, the 1832 McLane Report, and 1850) have been used. The late nineteenth-century data are perhaps the most abundant: they include the many surveys of Carroll Wright, the first Commissioner of Labor, covering the period 1888 to 1901; the various state bureau of labor reports beginning with the 1870s; and a Senate report on *Woman and Child Workers* (1910). Original schedules for several federal surveys have been located in the National Archives and are being sampled for the interwar period, beginning with time-budget surveys for the 1920s, the 1934/36 *Consumer Purchase Survey*, and a Woman's Bureau survey of clerical workers in 1939.

Evidence to date indicates that economic development during most of American history has led to increases in the rate of female participation in the market economy, although the participation of married women has changed markedly only in the twentieth century. Wage rates for women relative to those for men and the occupational structure of the female labor force have both been subject to abrupt change. Several distinct stimuli to these changes have been isolated, in particular the appearance of manufacturing activity in the early nineteenth century, and the rapid expansions of high school education in the early twentieth century and college education in the past two decades. Social and cultural change have generally followed economic change, rather than precipitating it.

Long-term change in the economic role of women can be interpreted within a human capital framework. In the pre-1910 period, earnings functions for manufacturing jobs indicate that labor market work for males and females alike required a substantial component of strength and that on-the-job, rather than formal, training was of major importance. Individuals tended to reach maximum productivity earlier in their lives than is currently the

<sup>1</sup>This research is part of NBER's Program in the Development of the American Economy; it has been supported by N.S.F. Grants #SOC 78-15037 and #SES 80-23643. The collection of the 1934/36 Consumer Purchase Survey has also been funded by NBER.

case. The predominant labor market work available in the nineteenth century would have been less attractive to married women than were the office and sales positions that increased rapidly in the early twentieth century. Such work substituted off-job for on-the-job training and required less physical strength. The evolution of labor market work for married women required an activity that could be entered without much penalty at any point in one's life and that had skills that did not depreciate substantially with time away from the job or with age itself. These were distinctly not the characteristics of manufacturing work in the nineteenth century.

Complicating this analysis is the fact that the birth rate, although declining in the United States during the nineteenth century, was substantial throughout. Thus, most married women had few years within which to work for pay. It may have been coincidental that the birth rate rapidly fell precisely when the nature of female work changed, around the 1920s, but both changes could also have been related to a third factor, the dramatic increase in high school education that preceded both. Thus, as the economy developed and the service sector expanded, jobs were progressively created that had attributes favored by married women. At the same time, universal education for America's young provided an abundant supply of qualified workers for such positions. Nineteenth-century work for women led to an increase in the labor-market role of young women; twentieth-century developments both in the general economy and in education eventually led to an increase in the labor-market role of married women.

Urbanization and industrialization increasingly separated the work place from the home over the eighteenth and nineteenth centuries. *City and Business Directories* indicate that in 1790 female heads of urban households who were in the labor force were largely employed within their homes: as cottage industry workers, proprietors, and boarding housekeepers. These early documents also reveal the extent to which widows assumed the businesses of their deceased husbands, thus raising questions as to the definition of labor-market activity for married women. Industrialization transferred employment from the home to the factory and shifted work from older to younger family members, as their wages rose relative to those of adults.

For most of the period from 1790 to 1910, women worked in the labor market only when young (before marriage), when older (after a husband's death), or if never married. By 1890 a high percentage of single, but few married, women worked outside the home, and thus within the nineteenth century work had become polarized over an individual woman's life cycle and between adult men and women. In 1890 an urban family's daughter, 15 to 24 years old, had a 54 percent probability of working in the labor market within any one year. This probability was reduced to less than 5 percent when she married, but it rose again to 22 percent if she became widowed between ages 45 and 54. Various factors led to changes in these data, so that sometime after 1910 the sharp demarcations in the spheres of home and market work slowly diminished, both for a cohort of women and between the sexes.

Change in the economic role of women can be divided into two periods: the first, from 1790 to 1910, primarily involved the expansion of industrial activity and the employment of unmarried women; the second, from 1910 to the present, concerns the rise of labor-market activity of married women and the emergence of clerical and other white-collar positions. Much of the analysis for the early period, from 1790 to 1850, extends the work of Goldin and Sokoloff, whose primary conclusion is that young, single women were a critical factor in the early industrialization of the Northeast.<sup>2</sup> Prior to the emergence of factory production, the wages of females relative to adult males in northeastern agriculture were quite low, probably around 30 to 35 percent. But these relative wages rose substantially with the spread of industry, achieving a level of 52 percent by 1850 and 58 percent by 1885, where they have remained for almost a century. The percentage of the manufacturing labor force composed of women and children reached a historical peak of over 40 percent just after 1840 and declined over the next half century.

Industrial development from 1820 to 1850 fundamentally altered the economic role of young women, while at the same time the relative productivity of women and children within the agricultural setting influenced various features of early industrial growth, particularly the appearance of large-scale factories. A substantial fraction of young women (30 percent) was recruited for factory work in many New England counties even as early as 1832. Data for teachers and servants allow the construction of a general labor force participation rate for this early period. As in the British case, the initially low relative wage of females within agriculture may have been caused by low productivity of northeastern agriculture; women and children may have been progressively excluded from certain tasks such as dairying, in which they were employed in the more prosperous midwestern states. The use of women and children in manufacturing was associated with large-scale industries, and their employment may have been facilitated by the nature of work organization, with its intricate division of labor and low supervisory costs.

The involvement of single women in the labor market widened still further from 1860 to 1910, with increased urbanization, industrialization, and immigration; single women comprised 76 percent of the total (white) female labor force in 1890. Because most of these daughters lived with their parents, their labor-force behavior is best analyzed within a framework of family decisionmaking. Studies of the labor-market work of children in late nineteenth-century cities demonstrate that children across the ethnic and racial spectrum were important secondary

<sup>2</sup>C. Goldin and K. Sokoloff, "Women, Children, and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses," NBER Working Paper No. 795, November 1981; and "The Relative Productivity Hypothesis of Industrialization: The American Case, 1820 to 1850," NBER Working Paper No. 722, July 1981.

workers.<sup>3</sup> They provided substantial percentages of total family income, as indicated by data on intrafamily transfers.<sup>4</sup> Assimilation for immigrant families involved withdrawing daughters from the labor force to work at home, while daughters in black families, excluded from manufacturing employment, worked with, rather than in place of, their mothers.

Occupations have been largely segregated by sex throughout American history, and the historical record points to some causal factors. Within the category of industrial jobs, earnings-experience profiles estimated for 1888 and 1907 indicate substantial and early on-the-job training for young women, but job advancement was eventually quite limited.<sup>5</sup> Similar data for young men show progressive movement to more complicated tasks, and earnings-experience profiles that peak far later in life. Where jobs were paid for by the piece, men and women were frequently occupied in the same position; where payment was by time, they rarely were. Job titles and tasks changed when real differences in productivity could not be monitored adequately; and job segregation, it appears, was used to circumvent differences in hourly pay for individuals within a particular job classification. The role of piece-rate work for women is thus a critical factor to be explained, and since almost one-half of all women workers in manufacturing were on incentive pay in 1890, it is one of statistical importance as well. Differences in expected labor-force attachment must surely have influenced the decisions of both laborers and their parents regarding formal and on-the-job training. Thus, turnover rates, estimated from experience distributions using stable population theory, are critical parameters. The role of late nineteenth-century labor legislation that restricted hours and wages for women, and the later influence of unions in this regard, must also be assessed.

Occupations for women, differing in substantial ways from those in manufacturing, emerged sometime in the early twentieth century. While it would be somewhat extreme to term these jobs "careers," they had certain characteristics that would lead to such a designation. One stimulus to this change was the rapid transformation in education that affected individuals in rural and urban areas alike. Gains in education for cohorts of white females born from 1900 to 1910 and finishing school from 1915 to 1928 were impressive; median years of schooling rose over three years on average or by one-third of the median for those born in 1900. The reasons for this dramatic increase are not yet fully understood and involve both economic and political factors. Skill premiums across all workers fell during this period, and returns to education, at the onset of this process, appear to have been the highest in American history.

<sup>3</sup>C. Goldin, "Household and Market Production of Families in a Late Nineteenth-Century City," *Explorations in Economic History* 16 (April 1979); and "Family Strategies and the Late Nineteenth-Century Family Economy: The Role of Secondary Workers," in T. Hershberg, editor, *Toward a New Urban History* (Oxford University Press, 1981).

<sup>4</sup>C. Goldin and D. Parsons, "Economic Well-Being and Child Labor: The Interaction of Family and Industry," *NBER Working Paper No. 707*, July 1981; and "The Adolescent, Intrafamily Relations, and the Industrial Revolution," mimeo, September 1980.

<sup>5</sup>C. Goldin, "The Work and Wages of Single Women: 1870-1920," *Journal of Economic History* 40 (March 1980).

One impact of increased high school education was the altered employment of young women in particular areas, most notably in the clerical sector. Of all the changes in the history of women's market work, few have been more impressive than the rapid emergence and feminization of the clerical sector and the related decline in manufacturing employment for women. A century ago few women were clerical workers; as early as 1920, 22 percent of all employed nonfarm women were, and about 50 percent of all clerical workers were women. Employment for women in the clerical sector expanded at five times the annual rate in manufacturing from 1890 to 1930, and during the same period wages for female clerical workers fell relative to those in manufacturing.

Earnings profiles for work in the manufacturing and in the clerical sectors were very different: for manufacturing the profiles rose steeply with experience, peaking early, while they were flatter for clerical work; returns to off-job training were high, and depreciation with age and with time away from work were low.<sup>6</sup> Work in the clerical sector can be viewed as the first major "career" to which women could return during some other part of their life cycle. Clerical work, teaching, and other professions were crucial links between work for single and for married women. Young, single women who were clerical workers in the 1920s, swelled the ranks of employed married women in the 1940s and 1950s.

Changes in market work for women generally reflect or are reflected in changes in various aspects of marriage, fertility, home life, and nonmarket production. Because the first of the two periods, 1790 to 1910, deals primarily with unmarried women, changes in fertility are of secondary importance to changes in age at first marriage and at remarriage. But in the second period, the factors that precipitated large changes in fertility—the decline in the 1920s and late 1960s, and the rise in the late 1940s and 1950s—are of critical importance. To study this, I am currently collecting the *Consumer Purchase Survey, 1934/36*, and I will use it to examine the poorly understood decline in fertility in the 1920s.

Changes in household production throughout American history have altered the economic role of women, although for much of this history single women, and not their mothers, have been most affected. The percentage of daughters who assisted full time at home declined in large cities from about 50 percent in 1880, to 30 percent in 1900, and to below 5 percent by 1930. Systematic data on economic activity by females within the agricultural and home sectors are virtually nonexistent for most of the pre-twentieth century, although time-budget studies for women on farms in the 1920s can be used. The economic impact of household modernization, as well as measures of home production, can be explored with the 1934/36 data, which include information on labor supply, capital goods, expenditures on all classes of goods, and time allocation for all household members.

A primary motivation for this study is the recent increase in market work for married women. Long-term

<sup>6</sup>C. Goldin, "The Historical Evolution of Female Earnings Functions and Occupations," *NBER Working Paper No. 529*, August 1980.

trends in the labor-force participation of married women point to incorporating specific cohort effects in addition to contemporaneous changes in wage rates, unemployment, and husband's income. Data for cohorts of married, white women in the United States born from 1866 to 1955 show a most often gradual, although occasionally dramatic, increase in labor-force participation rates.<sup>7</sup> Participation rates have increased in all age groups except for the very oldest in every census year since 1890. Large increases, however, begin in the decades of the 1940s and 1950s for women over 35 years old, and in the 1960s and 1970s for women under 35.

Perhaps the most remarkable feature of such cohort data is that the pattern of bimodal labor-force participation by age, so characteristic of post-1950 cross-section data, is not a characteristic of cohort data for married women, which universally show increasing labor-force rates to about age 55. The general increase in labor-force participation over time was sufficiently powerful that it more than compensated for decreases in the participation by women during their child-rearing years. No generation of young women in the United States born since about 1850 could have predicted from the experiences of their elders what their own work histories were likely to be. Each of these cohorts has been influenced in its decisionmaking both by the economic and social conditions at a particular date and by the education and work experiences it has carried with it through time. Previous studies have stressed point-in-time factors, summarized by the notions of income and substitution effects.<sup>8</sup> Yet a closer examination shows that cohorts have been endowed with vastly different degrees of both human capital and early socialization. A pooled, cross-section-time-series regression of aggregate data indicates that the human capital amassed by a particular cohort did influence its labor-force activity and did distinguish its labor-force growth from that of other cohorts at the same time.<sup>9</sup>

Among the many questions raised in this summary of the evolution of women's economic role, perhaps the most important from our current perspective is why change in the economic role of married women has taken so long. Since any alteration in the economic role of women must also involve social, cultural, and ideological factors, this issue is a complex one. This historical record points to the following tentative answer, which seems all the more convincing because it is not unique to the U.S. case: Despite high birth rates in the eighteenth and early nineteenth centuries, the proximity of home and work facilitated a market role for married women that was

more extensive than it was after industrial development. The rise of large-scale manufacturing increased the wages of the young relative to the old, of females relative to males, and of work in the factory relative to that in the home. Thus the nineteenth century witnessed a steady increase in the labor-market role of young, single, but not older, married women. Increases in schooling attainment at the beginning of this century and again in the last two decades, with the emergence of jobs in the clerical and related sectors, initiated the changes that eventually affected work for married women.

## International Trade

Paul Krugman

What explains international trade? For a number of years empirical economists have expressed growing dissatisfaction with the conventional view that trade can be explained solely by differences in the factor endowments of countries and in the factor intensities with which goods are produced. Recently this dissatisfaction has crystallized in a "new view" of international trade: one that preserves an important role for the traditional sources of comparative advantage but also assigns crucial roles to economies of scale and imperfect competition. As part of NBER's Program in International Studies, I have been attempting to clarify the analytical underpinnings of this new view of trade.<sup>1</sup> Even though this work is still in its first stages, if correct it has important implications for our understanding of trends in the world economy.

### The New View of Trade

The empirical critique of traditional trade theory can be summarized by pointing to two puzzles about international trade:

(1) *Much of the world's trade is among similar countries.* Traditional theories suggest that trade results from differences among countries, especially differences in the relative supplies of factors of production. Yet most of the exports of the industrial countries go to other industrial countries, which are fairly similar in capital-labor ratios and in the ratio of skilled to unskilled workers. Further, until the rise of OPEC the relative importance of

<sup>7</sup>C. Goldin, "A Quantitative Approach to Long-Term Trends in the Economic Role of Women." Paper prepared for presentation at the U.S.-U.S.S.R. Colloquium on Quantitative Methods in History, held in Tallinn, Estonia, June 1981.

<sup>8</sup>See, for example, J. Mincer, "Labor Force Participation of Married Women: A Study of Labor Supply," in H. G. Lewis, *Aspects of Labor Economics* (Princeton University Press, 1962).

<sup>9</sup>C. Goldin, "A Quantitative Approach . . ."

<sup>1</sup>See P. Krugman, "Increasing Returns, Monopolistic Competition, and International Trade," *Journal of International Economics*, November 1979; "Scale Economies, Product Differentiation, and the Pattern of Trade," *AER*, December 1980; "Intraindustry Specialization and the Gains from Trade," *JPE*, October 1981 and NBER Reprint No. 221, November 1981; "Trade in Differentiated Products and the Political Economy of Trade Liberalization," presented at the NBER Conference on Adjustment to Import Competition, May 1980, and forthcoming in an NBER conference volume; and "A 'Reciprocal Dumping' Model of International Trade" (with James Brander), mimeo, June 1981.

trade among the industrial countries was increasing, even though these countries were becoming more similar by most measures. It is true that the industrial countries account for most of world income, so that in some sense it is not surprising that they are each others' best customers, but conventional theory does not explain the basis for their trade.

(2) *There is extensive two-way trade in similar products.* A striking feature of trade in manufactured goods is that we often find countries exchanging products that are produced with similar factor intensities and in which neither country seems to have any particular cost advantage. A good example of this "intraindustry" trade is U.S.-Canadian trade in automotive products. Following the auto pact of 1965, Canada became simultaneously a large importer of automotive products from and a large exporter of automotive products to the United States. Less dramatic but similar experiences were typical of the growth in intra-EEC trade in the late 1950s and early 1960s. Like trade among the industrial countries, intraindustry trade seems to have been increasing in relative importance until the oil shock. The two trends are closely related: intraindustry trade is most important among countries at similar levels of development, so that we are not too far wrong if we use the general term "intratrade" to refer both to trade within an industry and trade among the industrial countries.

How does the new view explain these observations? It argues that there are two quite different kinds of international specialization: *interindustry* specialization, which reflects conventional comparative advantage, and *intraindustry* specialization, which instead reflects economies of scale. Factor endowments determine whether a country will be a *net* exporter or importer within broad commodity classes, but the advantages of long production runs lead each country to produce only a limited range of products within each class. The result is that countries with similar capital-labor ratios and skill levels will still have an incentive to specialize in producing different goods, and to trade. Their trade will be intraindustry in character—that is, it will involve little net trade in embodied factor services relative to the gross value of trade.

### Implications of the New View

If this new view of trade, with its emphasis on economies of scale as an important cause of trade, is accepted, it has important implications for the way we view world trade. It means that international markets must be viewed as imperfectly competitive; it calls into question the usual account of the gains from trade; and it suggests a rethinking of the effects of trade on the internal distribution of income.

The argument that economies of scale are an important source of trade means that international markets must be viewed as oligopolistic, or at best monopolistically competitive. As an empirical point this is not a problem; most manufactured goods in international trade are produced by firms that are clearly not perfect competitors. But imperfectly competitive markets are much harder to model than pure competition, so that many of the

clear answers of traditional trade theory become less certain.

This is particularly the case when the gains from trade are considered. In a world of imperfect competitors it is not necessarily true that trade is beneficial. For example, James Brander and I have recently argued that in oligopolistic markets there will frequently be too much trade.<sup>2</sup> Oligopolistic firms have an incentive to price discriminate, "dumping" into foreign markets, leading to excessive spending on transportation. In the most extreme case, there can be literal "cross-hauling": socially pointless two-way trade in the same product.

For the most part, however, the new view of trade suggests that the gains from trade are probably *larger* than traditional models would predict—partly because trade permits "rationalization" of industries to take advantage of economies of scale, and partly because of the effect of trade in increasing competition.

Perhaps the most important implication of the new view is the light it sheds on the effects of trade on the distribution of income within a country. The standard models are pessimistic about this: an expansion of trade invariably reduces the real income of some factor of production. The new models are less bleak: if the trade expansion takes the form of intraindustry rather than interindustry trade, everyone may benefit. Suppose, for example, that two countries with very similar relative factor supplies were to liberalize bilateral trade in manufactures. We would expect little net trade in factor services and thus little effect on the distribution of income in either country. But the countries would engage in intraindustry trade, allowing each to specialize on a narrower range of products while simultaneously maintaining or increasing the available variety. These effects will produce gains that may well outweigh the income-distribution effects. I have shown in a simple model that whether import-competing sectors gain or lose from trade depends on an index of the importance of scale economies, on one hand, and on an index of how different relative factor supplies are, on the other.<sup>3</sup>

### The Decline and Rise of Comparative Advantage

The distinction between interindustry trade and intraindustry trade suggests an interpretation of the evolution of trade among industrial countries in recent decades. The 1950s and 1960s were characterized by growing trade based on scale economies rather than comparative advantage, but the 1970s have seen a swing back to more conventional kinds of trade.

During the 1950s and 1960s, trade among the industrial countries grew faster than world trade as a whole; trade in manufactured goods increased its relative importance and became increasingly intraindustry in character. The reasons are not hard to find. First, the industrial countries

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<sup>2</sup>"A 'Reciprocal Dumping' Model . . ."

<sup>3</sup>"Intraindustry Specialization . . ."

were becoming more similar as Europe and Japan closed the gap between themselves and the United States. Second, the major trade liberalizations—the Common Market, the Kennedy Round, the auto pact—were concentrated on trade among the industrial countries, in manufactured goods, in industries where there were good prospects for intraindustry specialization. The important point here is that intratrade, because it has little effect on the income distribution, is relatively easy to liberalize. Thus the great postwar expansion of trade proceeded relatively painlessly.

The 1970s marked a sharp break, since the rise in commodity prices caused the United States to move from near balance into being a large net importer of raw materials and a large net exporter of agricultural products. The other change was the rise in exports of manufactures from newly industrializing countries (NICs). The trade of these countries with the already industrialized countries is primarily interindustry, not intraindustry—which may partly explain why their exports have created political problems out of all proportion to their share of gross trade. Despite the rise of the NICs, however, there has not been any clear movement toward interindustry specialization in manufactures trade—perhaps because the effect of the NICs is offset by the continuing convergence among industrial countries.

At this point, the new view of trade is still a matter of theoretical models supported by only rough empirical work. The serious statistical spadework remains to be done. Nonetheless, there is reason to hope that the new concepts will move us closer to a realistic model of international trade.

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## **Economic Outlook Survey**

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### **Fourth Quarter 1981**

Victor Zarnowitz

According to the median forecast from the latest survey of professional economic forecasters taken by NBER and the American Statistical Association, a general decline in economic activity will occur during 1981:4 and 1982:1. This downturn will cause a serious rise in the unemployment rates, which are predicted to average above 8 percent of the civilian labor force in each of the four quarters through 1982:3. Yet the projected recession is seen as essentially mild and short, and the forecasts of a moderate recovery in real GNP starting in the spring of 1982 are in percentage terms much like those made three months ago. The median forecasts continue to trace a moderate decline in the inflation rates, which may come to a halt late next year. The short-term interest rates are

now predicted to average more than 200 basis points less than those anticipated in the summer.

### **Fluctuations In Real GNP and Industrial Production**

As predicted in the previous survey, there was virtually no change in the overall volume of real GNP in the third quarter, but final sales weakened and inventories accumulated more than expected. The consensus is now extraordinarily strong that output will decline in 1981:4, with reported probabilities of the downturn averaging about 90 percent for the 36 respondents to this question. For 1982:1, the corresponding figure is less than 60 percent. According to the median forecasts, real GNP will decline at a 3.6 percent annual rate in 1981:4 and 0.8 percent in 1982:1. An upturn is then foreseen, with percentage increases in output averaging 3.6, 4.9, and again 4.9 percent in 1982:2, 1982:3, and 1982:4, respectively (all at annual, implicitly seasonally adjusted, rates). Individual assessments of the probability of a continuation of the recession average about 30 chances in 100 for 1982:2, less than half of that for 1982:3 and 1982:4.

It is worth noting that, should these composite forecasts come true, this recession would be of about equal length but lesser amplitude than the one in the first half of 1980 (when real GNP declined only in the second quarter but at an annual rate of nearly 10 percent). The year-to-year comparisons would then show small increases in total output both for 1980–81 (1.8 percent) and 1981–82 (0.5 percent), whereas the reported GNP in 1972 dollars was a trifle (2/10 of one percent) lower in 1980 than in 1979. The entire sequence of such frequent, short, and small fluctuations about so low a local growth trend would be a highly unusual one in the history of business cycles.

Typically, the sectors of manufacturing, mining, and public utilities display much greater cyclical sensitivity than total output. The FRB index of industrial production will decline 8.2 percent in 1981:4 and 5.3 percent in 1982:1, but will then increase at annual rates of 7 percent–9.5 percent in the three quarters 1982:2–1982:4. Between 1981:4 and 1982:4, the index is projected to rise 4.7 percent, as compared with a gain of 3.2 percent in real GNP.

### **More Unemployment, Less Inflation in 1982**

The quarterly averages of the total unemployment rates will jump from 7.2 to 8.1 percent between 1981:3 and 1981:4 according to the median forecasts, but they are not expected to climb much higher. The figure for 1982:1 is 8.3 percent, to be followed by a slow decline to 8.2 percent, 8.1 percent, and 7.8 percent in the spring, summer, and autumn quarters of next year. Most of the individual predictions cluster close to these averages, but a few pessimists foresee peak jobless rates in the 8.5 to 9.5 percent range. The median estimate for the year 1981 as a whole is 7.5 percent; that for 1982 is 8.2 percent.

The GNP implicit price deflator (IPD) is expected to rise 9.1 percent in 1981 and 7.9 percent in 1982. The reported individual probability distributions indicate that rises of more than 9.9 percent and of less than 6 percent

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

	Annual				
	1980 Actual	1981 Forecast	1982 Forecast	Percent Change	
				1980 to 1981	1981 to 1982
1. Gross National Product (\$ billions)	2626.1	2917.5	3170.5	11.1	8.7
2. GNP Implicit Price Deflator (1972 = 100)	177.4	193.6	208.8	9.1	7.9
3. GNP in Constant Dollars (billions of 1972 dollars)	1480.7	1508.0	1515.2	1.8	0.5
4. Unemployment Rate (percent)	7.1	7.5	8.2	0.4 <sup>1</sup>	0.7 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	163.2	154.0	154.0	-5.6	0.0
6. Nonresidential Fixed Investment (billions of 1972 dollars)	158.4	161.0	160.0	1.6	-0.6
7. New Private Housing Units Started (annual rate million)	1.3	1.1	1.3	-15.4	18.2
8. Change in Business Inventories (billions of 1972 dollars)	-2.9	6.0	3.0	8.9 <sup>2</sup>	-3.0 <sup>2</sup>
9. Treasury Bill Rate (3-month, percent)	11.6	14.0	11.5	2.4 <sup>1</sup>	-2.5 <sup>1</sup>
10. Consumer Price Index (annual rate)	13.5	10.5	8.7	-3.0 <sup>1</sup>	-1.8 <sup>1</sup>

	Quarterly							Percent Change	
	1981 Q3 Actual	1981 Q4	Q1	1982 Forecast		Q4	Q3 81 to Q3 82		
					Q2	Q3			
1. Gross National Product (\$ billions)	2947.0	2984.0	3034.0	3113.0	3214.0	3313.9	9.1	11.1	
2. GNP Implicit Price Deflator (1972 = 100)	195.4	199.5	203.2	206.9	210.3	214.2	7.6	7.4	
3. GNP in Constant Dollars (billions of 1972 dollars)	1508.2	1495.0	1491.7	1505.2	1524.0	1543.0	1.0	3.2	
4. Unemployment Rate (percent)	7.2	8.1	8.3	8.2	8.1	7.8	0.9 <sup>1</sup>	-0.3 <sup>1</sup>	
5. Corporate Profits After Taxes (\$ billions)	153.5	141.0	140.2	149.0	159.0	168.1	3.6	19.2	
6. Nonresidential Fixed Investment (billions of 1972 dollars)	161.0	159.5	158.0	158.0	160.0	164.0	-0.6	2.8	
7. New Private Housing Units Started (annual rate million)	1.0	0.9	1.0	1.2	1.3	1.5	30.0	66.7	
8. Change in Business Inventories (billions of 1972 dollars)	10.3	3.9	-1.0	3.5	3.9	5.6	-6.4 <sup>2</sup>	-1.7 <sup>2</sup>	
9. Treasury Bill Rate (3-month, percent)	15.1	11.8	10.8	11.0	12.0	12.6	-3.1 <sup>1</sup>	0.8 <sup>1</sup>	
10. Consumer Price Index (annual rate)	11.4	9.8	8.0	7.7	8.0	8.0	-3.4 <sup>1</sup>	-1.8 <sup>1</sup>	

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

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

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

in 1982 are regarded as extremely unlikely. In terms of quarterly changes at annual rates, as predicted by survey medians, IPD will increase 8.7 percent in 1981:4, 7.8 percent in 1982:1, 7.4 percent in 1982:2, 6.6 percent in 1982:3, and (note the upturn) 7.8 percent in 1982:4.

For the consumer price index (CPI), the corresponding inflation forecasts are 10.5 percent in 1981 and 8.7 percent in 1982. The quarterly figures are 9.8 percent in 1981:4 (down from 11.4 percent in 1981:3), 8 percent in 1982:1, 7.7 percent in 1982:2, and back to 8 percent in each of the following quarters of 1982.

In short, forecasters generally anticipate that the upward price pressures will lessen significantly in the year ahead. Inflation rates may increase slightly when the recovery speeds up in the second half of 1982, but they are unlikely to reenter the two-digit range.

### Limited Declines in Interest Rates

The average forecasts from the survey suggest that most of the decline in short-term interest rates is already over. The 3-month Treasury bill rate will drop sharply from 15.1 percent in 1981:3 to 11.8 percent in 1981:4. After reaching a low point of 10.8 percent in 1982:1, the bill rate is expected to move up in each of the three following quarters, to 11 percent, 12 percent, and 12.6 percent.

Yields on new issues of high-grade corporate bonds will decline from 16.3 percent in 1981:3 to 16 percent in 1981:4, 14.9 percent in 1982:1, and 14 percent or slightly more later in 1982. All the quoted interest rates are median estimates; the dispersion of the individual forecasts around the group averages increases rapidly with the distance to the target quarter.

The survey results imply that the current cyclical decline in short-term rates would be longer but much smaller than that in 1980 (by historical standards, both movements would have to be described as very short). Conforming to well-known past regularities, the long-term rates are expected to decline less than the short-term ones. The implicit real rates of interest fall within the range of 2 to 5 percent, depending on the measures used. They are lower in this survey than in the preceding one, and lower on the average in 1982 than in 1981, but they show an upward drift between 1981:4 and 1982:4.

### **Changes in Consumption and Housing**

Total personal consumption expenditures in 1972 dollars will remain practically unchanged in the current quarter and will grow at an annual rate of less than 2 percent in the first half of 1982. In the second half their growth will accelerate to 4-5 percent, for a gain of 3 percent between 1981:4 and 1982:4.

New private housing starts, having descended to well below the annual rate of 1 million units in 1981:4 (already less than the lowest level touched briefly during the 1980 recession), are expected to move upward through 1982 to 1.5 million units at the end of the year. Even after this rise, however, the housing industry would still be in a weak state comparable to that of early 1981, although presumably with better prospects for the near future. Residential fixed investment in 1972 dollars is projected to increase from \$41 billion annual rate in 1981:4 to \$50 billion in 1982:4, a gain of 22 percent, but on a year-to-year basis there would still be no improvement (the totals are \$46 billion for 1981 and \$45 billion for 1982).

### **Prospects for Corporate Profits, Business Investments, and Net Exports**

Corporate profits after taxes, which never fully recovered from their 20 percent drop in the 1980 recession, will decline to an annual rate of \$140 billion in 1982:1, 17 percent below their level in 1981:1. They are then expected to rise 19 percent to \$168 billion in 1982:4 (their peak in 1980:1 was \$183 billion).

Business inventory investment in 1972 dollars will drop from an annual rate of \$10 billion in 1981:3 to \$4 billion in 1981:4, turn negative early in 1982, and increase very moderately through the rest of next year. However, for this volatile variable, the survey averages are not really representative of the individual forecasts, which show great diversity and, in some cases, much larger variation over time.

Net exports of goods and services in constant dollars will decline by about \$8 billion in 1981 and \$5 billion in 1982, according to the median predictions, but a number of forecasters assume that the dollar will weaken and real exports will increase.

### **Government Purchases and Policy Assumptions**

Federal government purchases in 1972 dollars are estimated to have increased 2.6 percent in 1981-82 and are

projected to rise at a similar rate between 1981:4 and 1982:4. Most of the underlying assumptions about the size of the buildup of defense outlays fall in the range of 4-6 percent, but some specify 7-10 percent.

The constant-dollar purchases by state and local governments are to decline by 1.7 percent in 1981-82, almost exactly offsetting the rise in federal expenditures on goods and services. No net increase in state and local outlays in real terms is expected to occur between 1981:4 and 1982:4.

The forecasters generally assume an unchanged posture in fiscal policy consistent with the tax cuts enacted in 1981. On monetary policy the assumptions vary, with most respondents placing the growth rates for M-1B and M2 in the ranges of 4-6 percent and 8-10 percent respectively.

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

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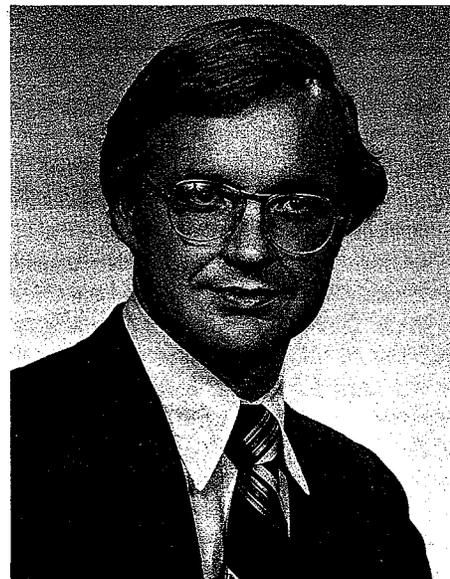
## **NBER Profiles**

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### **Michael R. Darby**

NBER Research Associate Michael R. Darby has been a member of the Bureau's Program in International Studies since 1976. A native of Dallas, Darby received his A.B. from Dartmouth College in 1967 and his Ph.D. from the University of Chicago in 1970.

From 1970-73, Darby was an assistant professor of economics at Ohio State University. In 1973, he was made an associate professor of economics at UCLA, where he was promoted to full professor in 1978.



Darby, whose fields of specialization are international finance, macroeconomics, and money and banking, was a consultant to the Federal Reserve System's Board of Governors in 1976 and a visiting fellow at the Hoover Institution from 1977-78. He is currently the editor of the *Journal of International Money and Finance* and a referee for numerous other journals.

In addition to his many journal articles, book reviews, and other papers, Darby has written two textbooks: *Macroeconomics: The Theory of Income, Employment, and the Price Level*, published in 1976, and *Intermediate Macroeconomics*, published in 1979, and a monograph, *The Effects of Social Security on Income and the Capital Stock*, also published in 1979.

Darby and his wife Jaye live in Woodland Hills, CA. His hobbies include art collecting, swimming, and red sports cars.

## Claudia Goldin

Claudia Goldin, associate professor of economics at the University of Pennsylvania, has been a member of NBER's Program in the Development of the American Economy since 1978. Goldin received a B.A. in economics from Cornell University in 1967, and a Ph.D. from the University of Chicago in 1972.



From 1971-73, Goldin was an assistant professor of economics at the University of Wisconsin, Madison. She then taught at Princeton University until 1979, at which time she joined the University of Pennsylvania faculty as an associate professor. Goldin was also a visiting lecturer in economics at Harvard University from 1975-76.

The author of numerous articles, working papers, and reviews in the field of economic history, Goldin is working on a second book, *Economic Change and American Women: An Economic History*. Her first book, published in 1976, is titled *Urban Slavery in the American South*,

*1820 to 1860: A Quantitative History*. She also serves on the editorial board of the *Journal of Economic History*, *Explorations in Economic History*, and *Historical Methods*, and is a member of the National Science Foundation's Review Panel in Economics.

Goldin lives in Princeton, NJ, and is the proud owner of an 11½-year-old golden retriever, Kelso, who is an avid jogger.

## Paul R. Krugman

Paul R. Krugman, a research associate in NBER's Program in International Studies, has been affiliated with the Bureau since 1978. A native of Albany, NY, Krugman received his B.A. from Yale University in 1974 and his Ph.D. from MIT in 1977.



Krugman was assistant professor of economics at Yale from September 1977 to June 1980. He has been associated with MIT as an associate professor of economics since July 1980. In the 1981 fall semester, Krugman taught International Economics in MIT's Economics Department and "The Economics of International Business" at MIT's Sloan School of Management.

Krugman, whose principal field is international economics, is the author of many papers and articles on exchange rates, trade, and balance-of-payments issues. He is also a referee for economic journals, including the *Journal of Political Economy* and the *Quarterly Journal of Economics*.

In addition to his teaching, Krugman has served as a technical consultant to the Banco de Portugal (in the summer of 1976) and a consultant to the U.S. State Department (January-July 1980).

Paul lives in Arlington, MA. In his spare time, he enjoys bicycling, cooking, music, and detective novels. (In spite of his interest in international trade, he does not enjoy travel and has no gift for languages.)

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# Conferences

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## Productivity Conference Held

Members and guests of NBER's Program on Productivity and Technical Change met in Lenox, Massachusetts, on October 2-4 for a Conference on R and D, Patents, and Productivity. Over a dozen papers on these and related topics were discussed, including several that reported on a series of studies originating in a project supervised by Program Director Zvi Griliches of Harvard University and M. Ishaq Nadiri of New York University and NBER:

Ariel Pakes, Hebrew University and NBER, "Patents, R and D, and the Stock Market Rate of Return" (NBER Working Paper No. 786)

Discussant: Andrew Abel, Harvard University and NBER

Jacques Mairesse, Institut National de la Statistique et des Etudes Economiques (ENSAE) and NBER, and Alan Siu, Harvard University, "An Accelerator Model of R and D"

Discussant: John Beggs, Yale University and NBER

Uri Ben-Zion, York University and Technion (Haifa), "The R and D Investment Decision and Its Relationship to the Firm's Market Value and Sales: Some Preliminary Results"

Discussant: Robert Evenson, Yale University

Philippe Cuneo, ENSAE, and Jacques Mairesse, "Productivity and R and D at the Firm Level in France"

Discussant: Kim Clark, Harvard University and NBER  
Zvi Griliches and Frank Lichtenberg, NBER, "Productivity and R and D at the Industry Level: Is There Still a Relationship?"

Discussant: Nestor Terleckyj, National Planning Association

F. M. Scherer, Northwestern University, "Using Linked Patent and R and D Data to Measure Interindustry Technology Flows"

Discussant: Edwin Mansfield, University of Pennsylvania

Robert Evenson, "Invention: International Comparisons"

Discussant: F. M. Scherer

John Beggs, "Long Run Trends in Patenting"

Discussant: Mark Schankerman, New York University and NBER

An introductory paper, "Who Does R and D and Who Does Patents?" by Griliches, Bronwyn Hall of NBER, and John Bound, Clint Cummins, and Adam Jaffee of Harvard University, described the large company data base that is being constructed at the Bureau. Among their findings is a relatively close proportional relationship of R and D expenditures to firm size across and with-

in most industries and a much stronger relationship between R and D expenditures and patenting in the drug industries than in the computer industry.

Several papers, including those by Pakes, Mairesse and Siu, and Ben-Zion, find a relationship between changes in a firm's stock market value, its R and D expenditures, and the number of patents applied for, although the exact causality of this relationship remains unclear.

Models of R and D determination were discussed by those authors, and by Nadiri and Schankerman in their paper, "Rational Expectations, Adjustment Costs, and Investment in Capital and R and D." The main measurable determinant of R and D expenditures appears to be past sales growth, although expectations about the future are also very important. One group of papers uses the stock market's valuation of the firm's future prospects as a proxy for such expectations. The Nadiri-Schankerman paper uses actual expenditure anticipations, as collected in the McGraw-Hill surveys, to capture similar phenomena.

A review paper of an extensive research program, "R and D and Innovation: Some Empirical Findings," was presented by Mansfield. Among the major findings he reported is the importance of long-term research programs to productivity growth, the growing contribution of research performed abroad by U.S. corporations to productivity growth in the United States, and the importance of federal research expenditures in stimulating private investment in R and D. The latter finding was also supported by Dartmouth economist John Scott's paper, "Firm versus Industry Variability and R and D Intensity," by similar findings reported by Nestor Terleckyj in conference discussion, and by preliminary results from a larger study of the influence of market structure on R and D expenditures and performance reported by Richard Levin and Peter Reiss of Yale, "R and D and Market Structure."

Papers by Cuneo and Mairesse, Griliches and Lichtenberg, and Scherer dealt with the relationship of productivity growth to R and D investment at the business line, firm, and industry level.

In spite of many reported difficulties both with the productivity data and with the availability and reliability of R and D statistics, all these studies find a significant relationship between R and D and subsequent productivity growth. Moreover, although the relationship has grown "noisier" in recent years, there is no strong evidence in the data examined at this conference that the "potency" of R and D expenditures has declined over time. Connected to this discussion was a report by Scherer on a major data collection project about the industrial "destination" (locus of ultimate use) of a large sample of patents and the use of this information to reclassify R and D expenditures by industry of "use" of the output of this activity rather than by industry where it took place. These new measures of R and D were used by Scherer to study the recent productivity slowdown. He, as well as Griliches and Lichtenberg, finds that even during the recent productivity decline, more R and D intensive industries did relatively better.

Additional historical and international perspectives were provided by the Evenson and Beggs papers. Evenson's paper looks at international patent statistics, observing both a growth in the number of foreigners patenting in other countries and an almost universal decline in the rate of patenting in recent years in most countries. The latter finding generated much inconclusive discussion at the conference: Does it signify a "depletion" of scientific opportunities or just a change in the economic climate that determines the level of patenting? Beggs finds five- to eight-year-long cycles in the historical statistics of U.S. patenting and interprets them as indicating waves of imitation that follow major technological breakthroughs.

The conference concluded with a panel discussion, "Toward a Synthesis," chaired by Rolf Piekartz of the National Science Foundation, with participation by Griliches, Levin, Mansfield, Nadiri, Pakes, Scherer, and others. A major area of disagreement was the utility of patent statistics for economic analysis. Doubts were raised both because of the large variability in the "importance" or economic value of individual patents and the different meaning, use, and impact of patents in different industries (for example, in pharmaceuticals, where they appear to be quite important, versus semi-conductors, where their role seems to be much more limited). Defenders of the use of patents pointed to the fact that they are one of the few direct quantitative indicators of inventive activity and hoped that the availability of large samples will allow the detection of common patterns even though individual fluctuations may mean little. It was agreed that the utility of such statistics will be ultimately tested in their use to explain other interesting phenomena, such as productivity change, and that much still remains to be done before one can answer such questions unequivocally.

In addition to the authors and discussants, the following guests attended the conference: Summath Addanki, David Mowery, and Manuel Trajtenberg, Harvard University; James Barth, Margaret Grucza, Daniel Newlon, and Eleanor Thomas, National Science Foundation; Martin Baily, Brookings Institution; Norman Baker and Alden Bean, University of Cincinnati; Roger Brinner, Data Resources, Inc.; Angelo Cardani, Bocconi University (Milan); Anil Delolalikar, Yale University; Walter Hahn, Library of Congress; Eric von Hippell, MIT; William Long, Federal Trade Commission; and Edward Wolff, New York University and NBER.

## Annual Research Conference in New York

NBER's Third Annual Research Conference was held in New York City on October 19, 1981. Over one hundred representatives of industry, nonprofit organizations,

and the press were briefed on the results of four current research projects that will soon be published in NBER books.

The first speaker, Anna Schwartz, is a research associate in the Bureau's Programs in International Studies and in Financial Markets and Monetary Economics. Dr. Schwartz is also Staff Director of the recently formed U.S. Government Gold Commission. She described her upcoming Bureau book, coauthored by Milton Friedman, *Monetary Trends in the United States and the United Kingdom: 1867-1975*. As the title suggests, this work encompasses more than a century of data on the business cycles and inflation experiences in the two nations and analyzes, in particular, relationships between monetary policies and the states of the economy in both countries.

Burton Malkiel, a research associate in the Bureau's Program in Financial Markets and Monetary Economics, and Dean of the Yale School of Management, was the second speaker of the day. He presented a summary of his upcoming NBER book, coauthored by John Cragg, *Investment Risk and Reward: An Expectational Study*. Malkiel and Cragg have collected and analyzed a new body of unpublished data on securities analysts' forecast; they examine the accuracy of these forecasts and look for systematic errors. They then use these data to develop and test a new theory of the risk-reward ratio for securities that goes beyond the conventional "beta" measure that is widely used in portfolio management. In particular, they show that the diversity of opinion among securities analysts is the best single measure of risk in the sense that it is most highly correlated with a security's yield.

"The Fluctuating U.S. Dollar: Causes, Consequences, and Policy Implications," by Jacob Frenkel, was the subject of the third presentation. Frenkel is a research associate in the Bureau's Program in International Studies and a professor of economics at the University of Chicago. His work is a study of exchange rates during the 1920s and 1970s; it compares the experiences of the United States and other nations both within and between the two decades. Among Frenkel's conclusions is the fact that exchange rates have not been excessively volatile in the recent past since, like other asset prices, they respond to "news" as it becomes available to the market.

Bureau President Martin Feldstein was the final speaker on the program. He presented highlights of a body of his work on "Inflation, Tax Rules, and Capital Formation" that will also be published as an NBER book. Feldstein's analysis shows a serious decline in net investment and capital formation in the United States since the 1960s. He concludes that the interaction of our tax system with the increasing rate of inflation was responsible for much of this decline in investment.

An NBER Summary Report on the conference, comprised of condensed versions of the four presentations and the discussions that followed, is now being prepared; publication is expected in early 1982. Future issues of the *NBER Reporter* will announce the availability of both the Summary Report and the four books discussed at the conference.

## Exchange Rates and International Macroeconomics

The annual NBER fall conference in Cambridge, held on November 20 and 21, 1981, focused on exchange rates and international macroeconomics. Under the chairmanship of Jacob A. Frenkel of the University of Chicago, a research associate in the Bureau's Program in International Studies, the conference brought together some 100 leading researchers in international economics from the United States and abroad. The following papers were presented and discussed during the two-day gathering:

Guillermo Calvo, Columbia University, "Staggered Contracts and Exchange Rate Policy"

Discussants: John Taylor, Princeton University and NBER, and Michael Mussa, University of Chicago and NBER

Paul Krugman, MIT and NBER, "Oil and the Dollar" (NBER Working Paper No. 554)

Discussants: Pentti Kouri, New York University and NBER, and Charles Wilson, University of Wisconsin

Peter Isard, Board of Governors of the Federal Reserve System, "An Accounting Framework and Some Issues for Modeling Exchange Rates"

Discussants: Sebastian Edwards, University of California at Los Angeles, and Jeffrey Frankel, University of California at Berkeley and NBER

Richard Meese and Kenneth Rogoff, Board of Governors of the Federal Reserve System, "Empirical Exchange Rate Models of the Seventies: Are Any Fit to Survive?"

Discussants: Nasser Saidi, University of Chicago and Graduate Institute of International Studies (Geneva), and Michael K. Salemi, University of North Carolina

Stanley Black, Vanderbilt University, "The Use of Monetary Policy for Internal and External Balance in Ten Industrial Countries"

Discussants: Leonardo Leiderman, Boston University, and Alan Stockman, University of Rochester and NBER

Lars Hansen, University of Chicago and Carnegie-Mellon University, and Robert J. Hodrick, International Monetary Fund and Carnegie-Mellon University, "Risk-Averse Speculation in the Forward Exchange Market: An Econometric Analysis"

Discussants: Craig Hakkio, Northwestern University and NBER, and Kenneth Singleton, Carnegie-Mellon University

Peter Hartley, Princeton University and NBER, "Rational Expectations and the Foreign Exchange Market"

Discussants: Debra Glassman, University of British Columbia, and Maurice Obstfeld, Columbia University, Board of Governors of the Federal Reserve System, and NBER

Willem H. Buiters, University of Bristol (England) and NBER, and Marcus Miller, University of Warwick (England), "Real Exchange Rate Overshooting and

the Output Cost of Bringing Down Inflation" (NBER Working Paper No. 749)

Discussants: Robert Flood, Board of Governors of the Federal Reserve System and NBER, and Jurg Niehans, University of Bern (Switzerland)

J. Peter Neary, University College, Dublin, and Douglas Purvis, Queen's University, London, "Real Adjustment and Exchange Rate Dynamics"

Discussants: Kent Kimbrough, Duke University, and Jeffrey Sachs, Harvard University and NBER

Calvo's paper examines the assumption of staggered contracts in the context of a small, open economy with both tradable and nontradable goods, and with and without flexible exchange rates. He pays special attention to the contractionary devaluation case in an income-expenditure framework. If capital mobility is perfect, this case is associated with multiple equilibrium solutions. If there are controls on capital mobility, or policies in effect enhance the expenditure-switching effects of devaluation, then the probability of obtaining a unique solution increases.

Krugman develops a simple theoretical model of the effect of an oil price increase on exchange rates. He finds that an oil price increase is likely to lead initially to an appreciation of the dollar, but eventually to depreciation.

Isard examines alternative models of exchange rates. His analytical framework includes an accounting identity devoid of behavioral assumptions and allowing for expectations about the long-run exchange rate, inflation differential, and risk premium. Using his accounting framework, Isard demonstrates that some common behavioral assumptions are inconsistent with data on exchange rates.

Meese and Rogoff's paper finds that a random-walk model would have outperformed both structural and time-series models of exchange-rate determination in predicting 1970s' rates. They also provide evidence that the forward rate is no better as a predictor than the random-walk model.

Black tries to quantify differences in the use of monetary policy instruments among ten leading industrialized countries. In general, he finds an inverse correlation between the importance that countries attach to inflation objectives and the rates of inflation during the 1970s, an inverse relationship between the importance of inflation and unemployment objectives, and little relationship between unemployment objectives and observed unemployment.

Hansen and Hodrick investigate risk premiums in forward markets for foreign exchange and develop hypotheses regarding the divergence between forward rates and expected future spot rates. They find that risk premiums are important, at least in the case of the Swiss franc and the Japanese yen.

Hartley tests the hypothesis that expectations of exchange-rate movements are formed rationally. He presents some empirical results on the U.S. dollar/Deutsche-mark and U.S. dollar/U.K. pound exchange rates during the most recent floating-rate period.

The Buitter-Miller paper attempts to provide an improved theory of the behavior of an open economy with flexible exchange rates when wages and prices are less than perfectly flexible. The authors then calculate the output cost of slowing the inflation rate and the effects of a temporary incomes policy.

Neary and Purvis present a model for analyzing macroeconomic responses to sectoral shocks and the interaction between resource allocation and exchange-rate variability. They focus, in particular, on the dynamic adjustment elicited by the sluggish reallocation of capital in response to a change in relative returns.

An NBER Conference Summary Report, with brief synopses of each of the papers, will be published in 1982. Also, it is anticipated that a full conference volume will be published in the coming year. Availability of both of these publications will be announced in future issues of the *NBER Reporter*.

## Measuring Labor Costs

A meeting of NBER's Conference on Research in Income and Wealth, focusing on "The Measurement of Labor Cost," was held in Williamsburg, Virginia, on December 3-4. After welcoming remarks by George L. Stelluto, Assistant Commissioner, Wage and Industrial Relations, Bureau of Labor Statistics, the first session convened:

### *Overview: Concepts, Methodology, and Data*

Chairman: H. Gregg Lewis, Duke University

Walter Y. Oi, University of Rochester, "The Fixed Employment Costs of Specialized Labor"

Discussant: Ernst Berndt, MIT and NBER

James N. Brown, Stanford University and NBER, "Structural Identification in Hedonic Markets"

Discussant: Jack E. Triplett, Bureau of Labor Statistics

Joseph R. Antos, Bureau of Labor Statistics, "Data Sources for the Analysis of Labor Cost"

Discussant: F. Thomas Juster, Institute of Social Research, University of Michigan

Oi's paper deals with the extent to which fixed employment costs determine the structure of firms and industry. He finds that firms are heterogeneous, and a small number of very large firms are able to operate successfully because they adopt rigid, assembly-line production processes. These firms incur large recruiting and training costs and thus have an incentive to use compensation packages to attract and retain specifically trained workers.

Much of the recent literature has been concerned with estimating how wage differentials are related to nonpecuniary job characteristics such as location, hazards, and the like. To remove the effects of such characteristics on employers' demand and workers' supply of labor, Brown shows that a technique relating (wage) payoffs to the amount and type of nonpecuniary characteristics must be included in the standard supply-demand equa-

tions. Using this technique, one can infer that past estimates of supply and demand for workers may not have reflected the true underlying relation between the two.

Antos discussed a variety of BLS data sources, some of which are new, or have not been fully utilized, that are available to assist in the tricky business of measuring compensation. After his presentation, there was a general discussion of issues introduced during the morning.

The program for the second session was as follows:

### *Measures of Aggregate Labor Cost in the U.S.*

Chairman: Sherwin Rosen, University of Chicago and NBER

Frank M. Gollop, Boston College, and Dale A. Jorgenson, Harvard University, "Sectoral Measures of Labor Compensation for the United States, 1948-1978"

Discussant: Erwin Diewert, University of British Columbia

Lee A. Lillard, James P. Smith, and Finis R. Welch, The Rand Corporation and UCLA, "What Do We Really Know about Wages? The Importance of Nonreporting and Census Imputation"

Discussant: Donald B. Rubin, University of Wisconsin

Timothy M. Smeeding, University of Utah and U.S. Bureau of the Census, "The Size Distribution of Nonwage Compensation: Employer Cost versus Recipient Value"

Discussant: Martin David, University of Wisconsin

Using a variety of data sources and statistical techniques, Gollop and Jorgenson have developed measures of labor costs and inputs for each of 51 industrial sectors, including data on hours worked and labor compensation for 1600 types of labor input for each sector in each year from 1948 to 1978. Their data have a wide variety of applications; for example, they can be used to study the impact of relative wages on the composition of demand for labor input by occupational groups.

The paper by Lillard, Smith, and Welch deals with the Census Bureau's estimation of income of those who do not report it when surveyed. They show that the Census Bureau's estimation procedure substantially understates the actual earnings of nonrespondents. One likely consequence of this is that the true rate of growth of earnings and income in the 1970s may have been understated.

Smeeding merges data from the Current Population Survey (CPS) and other sources to derive "returns to work" for each person in the CPS. He is thus able to estimate, for example, how the employer cost and the employee value of fringe benefits differ and how fringes affect the size distribution of total compensation.

The program for the third conference session was as follows:

### *Pensions and Benefits as Labor Cost Components*

Chairman: John Cogan, Assistant Secretary for Policy, Evaluation, and Research, U.S. Department of Labor

Ronald Ehrenberg, Cornell University and NBER, and Robert Smith, Cornell University, "Estimating Wage-Fringe Trade-Offs: Some Data Problems"

Discussant: Charles Brown, University of Maryland and NBER

Richard V. Burkhauser, Vanderbilt University, and Joseph Quinn, Boston College, "The Effect of Pension Plans on the Pattern of Life-Cycle Compensation"

Discussant: Cordelia Reimers, Princeton University  
Arleen Leibowitz, The Rand Corporation, "Fringe Benefits in Employee Compensation"

Discussant: B. K. Atrostic, Bureau of Labor Statistics

The paper by Ehrenberg and Smith uses data on 200 firms, provided by a private, compensation consulting firm, to ask whether higher fringes (such as future pension benefits) are traded for lower wages. In fact, they find no evidence of such a trade-off and discuss why and whether different types of data could have led to a different conclusion.

Burkhauser and Quinn's study of the role of pension plans in adjusting compensation over the years of an individual's employment shows that such plans act much like mandatory retirement: they alter the implicit contract between workers and firms when wages would otherwise exceed workers' marginal products. They then examine the effect of pension and Social Security rules, determining that the two significantly reduce net earnings after age 63.

Leibowitz examines data from the Health Insurance Study to show that there are significant differences by sex and race in the probability of receiving benefits. However, she finds little evidence that omitting benefits or taxes from earnings functions systematically affects comparison among sex or union groups.

The program for the final session was:

*Labor Cost Measures and Economic Policy Analysis*

Chairman: Orley Ashenfelter, Princeton University

R. Robert Russell, New York University, and Stuart McMenamin, University of California at San Diego, "Measuring Labor Compensation in Controls Programs"

Discussant: Donald Nichols, University of Wisconsin  
Daniel S. Hamermesh, Michigan State University and NBER, "Alternative Measures of the Cost of a Worker: Implications for Demand Elasticities and Normal Wage Growth"

Discussant: Edward Lazear, University of Chicago and NBER

George E. Johnson, University of Michigan, "Regional Wage Differentials in the United States: Patterns, Determinants, and Trends"

Discussant: Richard F. Muth, Stanford University

Russell and McMenamin discuss total wage measurement under a program of wage and price controls. They cover such difficulties as valuing incentive pay arrangements and future benefits, and how to treat cost-of-living adjustments.

Hamermesh constructs a quarterly time series on labor costs that accounts for deviations of hours paid from hours worked, for the tax treatment of wages under the corporate income tax, and for variations in the user cost of training. When used in labor demand equations, his

estimates generally produce better fits and higher wage elasticities. They also suggest that nominal growth in labor costs has been more responsive to variations in price inflation than the published labor-cost series indicate.

Holding constant for individual characteristics in the 1973-76 Current Population Survey, Johnson finds large differences in real wages across areas. He also finds no evidence that widespread unionism in an area raises the real wage of nonunion workers there. Finally, Johnson observes little difference in real wages across areas with different unemployment rates.

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## Conference Calendar

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

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Spring 1982 issue of the *Reporter* is March 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3974.

### March 5-6, 1982

Program Meeting: Economic Fluctuations, NBER

### March 18-21, 1982

The Classical Gold Standard, NBER

### March 25-26, 1982

Financial Aspects of the U.S. Pension System, NBER

### April 1-2, 1982

Panel on Economic Activity, Brookings Institution

### April 15-16, 1982

Program Meeting: Taxation, NBER

### April 23, 1982

Program Meeting: Labor Studies, NBER

### April 30-May 1, 1982

Inflation and Business Fluctuations, NBER

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

**May 14-15, 1982**  
Transfer Payments, NBER (Income and Wealth)

**May 21-22, 1982**  
Meeting on Trade Relations, NBER

**June 17-18, 1982**  
Pension Workshop, NBER

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

**June 27-July 1, 1982**  
Microdata and Public Economics, Social Science Research Council and NBER

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

**July 8-9, 1982**  
Program Meeting: Economic Fluctuations, NBER

**July 15-19, 1982**  
Annual Conference, Western Economic Association

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

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

**September 16-17, 1982**  
Panel on Economic Activity, Brookings Institution

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

**October 16-20, 1982**  
Annual Conference, American Bankers Association

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

**November 5-6, 1982**  
Incentive Effects of Government Spending, NBER

**November 19-20, 1982**  
50th Anniversary of Berle and Means's book, *The Modern Corporation and Private Property*, Hoover Institution

**December 3-4, 1982**  
U.S. Trade Relations; NBER

**December 9-10, 1982**  
Research in Labor Economics, NBER

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

**March 24-26, 1983**  
Pension/Labor Conference, NBER

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

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

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

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

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

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

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

**August 11-15, 1985**  
Annual Meeting, American Statistical Association

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

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## Bureau News

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### Current Recession Began in July

NBER's Business Cycle Dating Committee met on January 6 and identified July 1981 as the most recent peak in U.S. economic activity. The peak marks the onset of a recession in the business-cycle chronology maintained by the Bureau.

In the opinion of the committee, there is no doubt that the U.S. economy is currently undergoing a recession. All the indicators traditionally considered are well below their peaks. Industrial production in November 1981 was 146.5, well below its level of 153.9 in July. Employees on nonagricultural payrolls were 91,561,000 in November, as compared to 92,033,000 in September. The unemployment rate was 8.4 percent in November, relative to 7.0 percent in July.

The committee considered a wide variety of evidence in determining that the peak occurred in July. Although different indicators of economic activity peaked at different times during the year, as is typically the case at business-cycle turning points, the configuration of the downturn among the main series clearly suggested a July peak. Of the major indicators, both industrial production and unemployment signaled peaks in July; manufacturing and trade sales, adjusted for inflation and real GNP, peaked somewhat earlier; nonfarm employment and real personal income, excluding transfer payments, peaked later.

The committee also reviewed its earlier decision that a peak of economic activity occurred in January 1980 and a trough in July 1980 and reaffirmed that decision. Although not all economic indicators had regained their 1979-80 peaks by the summer of 1981, the committee

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

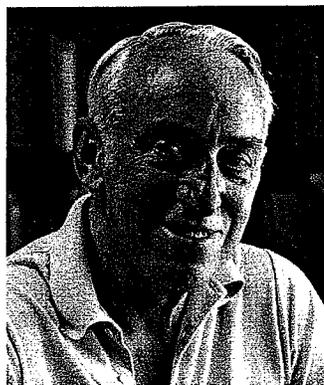
agreed that the resurgence of economic activity in the previous year clearly constituted a business-cycle recovery. Even so, the twelve-month expansion beginning in July 1980 and ending in July 1981 was one of the shortest on record in the NBER's business-cycle chronology that dates back to 1854, and the shortest since WWII. The expansion of 1912 lasted twelve months; the expansion of 1919 lasted ten months.

Committee members are William Branson, Princeton University; Martin Feldstein and Benjamin Friedman, Harvard University; Robert Gordon, Northwestern University (who did not attend the meeting); Robert Hall, Stanford University; Geoffrey Moore, Rutgers University; and Victor Zarnowitz, University of Chicago.

## Tobin Named to Board

James Tobin was appointed to NBER's Board of Directors at their September 28 meeting in Cambridge. He succeeds Lloyd G. Reynolds as Yale University's representative on the Board.

Tobin has been affiliated with Yale since 1950 and has been Sterling Professor of Economics there since 1957. In addition to his teaching and research, he was a member of the Council of Economic Advisers under John F. Kennedy in 1961-62.



*James Tobin*

Tobin is a past president of the American Economic Association (1971), the Econometric Society (1958), and the Eastern Economic Association (1977). His current association memberships also include the National Academy of Sciences, American Academy of Arts and Sciences, the American Philosophical Society, and the Academy of Sciences of Portugal (as a Foreign Associate). In addition to numerous journal articles, collected in three volumes, Tobin has authored a number of books including *National Economic Policy*, *The New Economics One Decade Older*, and *Asset Accumulation and Economic Activity* (reflections on contemporary macroeconomic theory).

Tobin was awarded the 1981 Prize in Economic Science in memory of Alfred Nobel.

## Three Named to Executive Committee

At its September meeting, NBER's Board of Directors elected three new members to the Bureau's Executive Committee: Paul W. McCracken, Rudolph A. Oswald, and Stephen Stamas.



*Paul W. McCracken*

McCracken, a professor of business administration at the University of Michigan, received his Ph.D. in economics from Harvard University. He was a member of the President's Council of Economic Advisers from 1956-59, and chairman of that group from 1969-70. He is currently a member of President Reagan's Economic Policy Advisory Board.

Oswald, who holds a Ph.D. in economics from Georgetown University, has been director of the AFL-CIO's Department of Research since 1976. He previously served as an AFL-CIO economist and assistant director of that union's education department, as research director of the Service Employees International Union, and as research and education director of the International Association of Fire Fighters.



*Rudolph A. Oswald*



*Stephen Stamas*

Stamas, vice president in charge of public affairs for Exxon Corporation, holds a Ph.D. from Harvard University. He joined Exxon in 1960 and has held positions in their financial, supply, and corporate planning areas. Stamas has also served as Deputy Assistant Secretary for Financial Policy in the U.S. Department of Commerce and as a loan officer for the Development Loan Fund.

Other current members of the Executive Committee are Moses Abramovitz, Stanford University; George T. Conklin, Jr., Guardian Life Insurance Company; Solomon Fabricant, NBER, Emeritus Research Associate; David L. Grove, International Chamber of Commerce; Walter W. Heller, University of Minnesota; Geoffrey H. Moore, Rutgers University; Almarin Phillips, University of Pennsylvania; and Richard N. Rosett, University of Chicago Graduate School of Business. Ex-officio members of the committee are: NBER Chairman Eli Shapiro, MIT's Sloan School of Management; NBER Vice Chairman Franklin A. Lindsay, Chairman of the Board of Itek Corporation; Bureau President Martin Feldstein; and NBER Treasurer Charles A. Walworth, a partner in Deloitte, Haskins, and Sells.

## Summary Report Published

NBER's fourth summary report, *Inflation and Financial Markets*, was published this fall. The twenty-page booklet, written in fairly nontechnical language and designed for a broad audience, summarizes the eight papers presented at the NBER Conference on Inflation and Financial Markets held in May 1981. (See *NBER Reporter*, Summer 1980, page 16, for a list of these papers.) This report may be obtained free of charge from the Publications Department, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## Conference Papers Available

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

Individual copies of Conference Papers are available free of charge to corporate associates and other supporters of the National Bureau. Others can receive copies by sending \$1.50 per copy to: Conference Papers, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Prepayment is required on orders totaling less than \$10.00. Please use the following numbers when ordering papers:

### Simulation Methods in Tax Policy Analysis

(It is expected that the papers resulting from this conference will be published in a volume edited by Martin Feldstein.)

- WP 497. "Alternative Tax Treatments of the Family: Simulation Methodology and Results," by Daniel Feenberg and Harvey S. Rosen
- WP 583. "Modeling Alternative Solutions to the Long-Run Social Security Funding Problem," by Michael Boskin, Marcy Avrin, and Kenneth Cone
- WP 673. "A Reexamination of Tax Distortions in General Equilibrium Models," by Don Fullerton and Roger Gordon
- WP 681. "Alternative Tax Rules and Personal Saving Incentives: Microeconomic Data and Behavioral Simulations," by Martin Feldstein and Daniel Feenberg
- WP 682. "Simulating Nonlinear Tax Rules and Nonstandard Behavior: An Application to the Tax Treatment of Charitable Contributions," by Martin Feldstein and Lawrence B. Lindsey
- WP 729. "National Savings, Economic Welfare, and the Structure of Taxation," by Alan Auerbach and Laurence Kotlikoff
- WP 757. "Tax Reform and Corporate Investment: A Microeconomic Simulation Study," by Michael Salinger and Lawrence Summers
- WP 788. "Stochastic Problems in the Simulation of Labor Supply," by Jerry Hausman
- WP 798. "Issues in the Taxation of Foreign Source Income," by Daniel Frisch
- WP 799. "A General Equilibrium Model of Taxation with Endogenous Financial Behavior," by Joel Slemrod
- WP 822. "Alternatives to the Current Maximum Tax on Earned Income," by Lawrence B. Lindsey
- "The Distribution of Gains and Losses from Changes in the Tax Treatment of Housing," by Mervyn King (This paper is not yet available through the NBER.)
- "Domestic Tax Policy and the Foreign Sector: The Importance of Alternative Foreign Sector Formulations to Results from a General Equilibrium Tax Analysis Model," by Lawrence Goulder, John Shoven, and John Whalley (This paper is not yet available through the NBER.)

### The Changing Roles of Debt and Equity in Financing U.S. Capital Formation

(These papers will appear in a volume tentatively titled *The Changing Roles of Debt and Equity in Financing U.S. Capital Formation*, edited by Benjamin Friedman and published by the University of Chicago Press.)

- WP 699. "Inflation, Resource Utilization, and Debt and Equity Returns," by Patric H. Hendershott
- WP 700. "Risk and Return: A New Look," by Burton G. Malkiel

- WP 701. "Investment Strategy in an Inflationary Environment," by Zvi Bodie
- WP 702. "Changing Balance Sheet Relationships in the U.S. Manufacturing Sector, 1926-77," by John H. Ciccolo, Jr.
- WP 703. "Private Pensions as Corporate Debt," by Martin Feldstein
- WP 704. "Debt and Economic Activity in the United States," by Benjamin Friedman

### **Inflation and Financial Markets**

(A Summary Report of this conference is available from NBER.)

- CP 119. "Effects of Nominal Contracting on Stock Returns," by Kenneth R. French, Richard S. Ruback, and G. William Schwert
- CP 120. "Welfare Implications of Interest Rates, Inflation, and Unemployment from Common Stock Returns," by Mark L. Gertler and Earl L. Grinols
- CP 121. "Interest Rates, Expected Inflation, and Supply Shocks, or Why Real Interest Rates Were So Low in the 1970s," by James A. Wilcox
- CP 122. "Empirical Comparisons of Divisia and Simple Sum Monetary Aggregates," by William A. Barnett, Paul A. Spindt, and Edward K. Offenbacher
- CP 123. "Real and Nominal Factors in the Cyclical Behavior of Interest Rates, Output, and Money," by Kenneth J. Singleton
- WP 588. "Inflation, Taxation, and Corporate Behavior," by Roger H. Gordon
- WP 760. "Anticipated Money, Inflation Uncertainty, and Real Economic Activity," by John H. Makin  
"The Nonadjustment of Nominal Interest Rates," by Lawrence Summers (This paper is not yet available through the NBER.)

### **Social Experimentation**

(These papers will be submitted to the University of Chicago Press to be considered for publication in a volume tentatively titled *Social Experimentation*, edited by Jerry Hausman and David Wise.)

- CP 124. "Toward Evaluating the Cost-Effectiveness of Medical and Social Experiments," by Frederick Mosteller and Milton C. Weinstein
- CP 125. "The Residential Electricity Time-of-Use Pricing Experiments: What Have We Learned?" by Dennis J. Aigner
- CP 126. "Income Maintenance Policy and Work Effort: Learning from Experiments and Labor Market Studies," by Frank P. Stafford
- CP 127. "Macro Experiments versus Micro Experiments for Health Policy," by Jeffrey E. Harris
- CP 128. "Can Social Experiments Be Useful Providers of Information to the Policy Process?" by David S. Mundel

- CP 129. "Social Science Analysis and the Formulation of Public Policy: Illustrations of What the President 'Knows' and How He Comes to 'Know' It," by Ernst W. Stormsdorfer
- WP 657. "Housing Behavior and the Experimental Housing Allowance Program: What Have We Learned?" by Harvey S. Rosen  
"Technical Problems in Social Experimentation: Cost versus Ease of Analysis," by Jerry Hausman and David Wise (This paper is not yet available through the NBER.)

### **Financial Policies and the World Capital Market: The Problem of Latin American Countries**

(These papers will be submitted to the University of Chicago Press to be considered for publication in a volume tentatively titled *Financial Policies and the World Capital Market: The Problem of Latin American Countries*, edited by Pedro Aspe Armella, Rudiger Dornbusch, and Maurice Obstfeld.)

- CP 130. "Stories of the 1930s for the 1980s," by Carlos F. Diaz Alejandro
- CP 131. "Dollarization in Mexico: Causes and Consequences," by Guillermo Ortiz
- CP 132. "On Equilibrium Wage Indexation and Neutrality of Indexation Policy," by Nissan Liviatan
- CP 133. "Comments on 'On Equilibrium Wage Indexation and Neutrality of Indexation Policy,'" by Mario Henrique Simonsen
- CP 134. "Financing Private Business in an Inflationary Context: The Experience of Argentina between 1967 and 1980," by Domingo F. Cavallo and A. Humberto Petrei
- CP 135. "Debt and the Current Account Deficit in Brazil," by Olivier Jean Blanchard
- CP 136. "Trying to Stabilize: Some Theoretical Reflections Based on the Case of Argentina," by Guillermo A. Calvo
- CP 137. "Interest Differential and Covered Arbitrage," by Jose Saul Lizondo
- WP 770. "Capital Mobility and the Scope for Sterilization: Mexico in the 1970s," by Robert E. Cumby and Maurice Obstfeld
- WP 783. "Seigniorage and Fixed Exchange Rates: An Optimal Inflation Tax Analysis," by Stanley Fischer
- WP 785. "Real versus Financial Openness under Alternative Exchange-Rate Regimes," by Michael Bruno  
"Optimal Economic Integration: A Skeptical View," by Michael Mussa (This paper is not yet available through the NBER.)

### **International Seminar on Macroeconomics**

(These papers will be published in a special edition of the *European Economic Review*, edited by Georges de Menil and Robert Gordon.)

- CP 138. "Simulating an Oil Shock with Sticky Prices," by Francesco Giavazzi, Mehmet Odekon, and Charles Wyplosz
- CP 139. "Relative Price Variability and Inflation in the United States and Germany," by Stanley Fischer
- CP 140. "A Test of the Equilibrium Hypothesis Based on Inventories: A Communication," by G. Ducos, Jerry Green, and Jean-Jacques Laffont
- CP 141. "Economic Policy in the Face of Declining Productivity Growth," by William D. Nordhaus
- CP 142. "Real-Exchange-Rate Overshooting and the Output Cost of Bringing Down Inflation," by Willem H. Buiter and Marcus Miller
- CP 143. "The Transmission of International Disturbances: A French-German Cliometric Analysis, 1972-1980," by Georges de Menil and Uwe Westphal

## Economic Fluctuations Meeting in Chicago

NBER Research Associate Robert Lucas of the University of Chicago organized and chaired a meeting of members of the NBER economic fluctuations group in Chicago on October 9 and 10. The following papers were discussed during the two-day meeting:

Finn Kydland, Carnegie-Mellon University, and Edward Prescott, University of Minnesota, "Time to Build and Aggregate Fluctuations"

Discussant: John Taylor, Princeton University and NBER

Robert King, University of Rochester and NBER, and Charles Plosser, University of Rochester, "The Behavior of Money, Credit, and Prices in a Real Business Cycle"

Discussant: Costas Azariadis, University of Pennsylvania

Benjamin Friedman, Harvard University and NBER, "The Roles of Money and Credit in Macroeconomic Analysis"

Discussant: Robert Barro, University of Rochester and NBER

Robert Litterman, Federal Reserve Bank of Minneapolis and NBER, and Laurence Weiss, University of Chicago and NBER, "Money, Real Interest Rates, and Output"

Discussant: Robert Shiller, MIT and NBER

Robert Townsend, Carnegie-Mellon University, "Forecasting the Forecasts of Others"

Discussant: Carl Futia, Bell Laboratories

Thomas Sargent, University of Minnesota and NBER, "Stopping Moderate Inflation: The Methods of Poincaré and Thatcher"

Discussant: Bennett McCallum, Carnegie-Mellon University and NBER

The Kydland-Prescott paper modifies an equilibrium growth model and uses it to explain: the cyclical variances of a set of economic time series; the covariances between real output and the other series; and the autocovariance of output. The model is fitted to quarterly data for the postwar U.S. economy; its crucial features are the assumption that more than one time period is required for the construction of new productive capital, and that current preferences are affected by choices made for leisure in the past. The fit is surprisingly good in light of the model's simplicity and the small number of free parameters.

The paper by King and Plosser describes an initial attempt to account for the money-output relationship through the operation of the banking system and the monetary authority, in a business cycle that is fully "real" in origin. Broadly, the real sector drives the monetary sector, in contrast to the traditional view of monetary movements as business-cycle impulses. The theoretical analysis focuses on the banking system's central position in the economy while deemphasizing the role of central bank policy response. Preliminary empirical analysis at the annual interval provides general support for this focus, since much of the correlation between monetary measures and real activity is apparently with inside money.

Friedman uses post-World War II U.S. data to explore the interrelationships among money, credit, and nonfinancial economic activity, and then goes on to consider the implications for macroeconomic modeling and for monetary policy of the empirical results that emerge. The paper shows that the volume of outstanding credit is as closely related to economic activity as is the stock of money, and moreover that neither money nor credit is sufficient to account fully for the effect of financial markets in determining real economic activity. Instead, what appears to matter is an interaction between money and credit. This result is consistent with a macroeconomic modeling strategy that explicitly deals with both the money market and the credit market, and with a monetary policy framework based on the joint use of a money-growth target and a credit-growth target.

While most theories of the business cycle attribute a central role to expected real interest rates, Litterman and Weiss consider the money/real interest rate/output link and find that real interest rates are exogenous (not caused by money) and that innovations in nominal interest rates, not real rates, cause movements in output. They consider two explanations, one relying on structural nonneutralities of inflation, and the other emphasizing unidentified information that influences both output and inflation.

Townsend's paper explores the formulation and analysis of equilibrium models of investment in which decision makers forecast the forecasts of others. Kalman-filtering techniques are shown to be applicable in an illustrative hierarchical information structure, and a nonlinear technique of undetermined coefficients, which plays on alternative moving average representations, is shown to be applicable in an illustrative symmetric information structure in which there is a confounding of laws of motion with forecasting problems. The equilibrium

time series of these models can display interesting and considerable movement in response to shocks and measurement errors, including damped oscillations around steady-state values rather than the usual exponential decay. More generally, these models do place restrictions on observed time series and can be fitted to data.

Sargent describes events in the French economy from 1921-27 and in the British economy from 1978-present. He compares fiscal and monetary policies in the two countries and interprets them in the light of various dynamic macroeconomic theories. His paper argues that fiscal policy is the cause of inflation, in the sense that control of inflation in an economy threatened with government insolvency requires correction of the insolvency. An attempt is also made to discover some of the reasons for the different results achieved by Poincare and Thatcher.

In addition to the authors and discussants, NBER research associates John Bilson, Dennis Carlton, Jacob Frenkel, Sanford Grossman, Frederic Mishkin, and Victor Zarnowitz, and research fellows David Hsieh and John Huizinga, all of the University of Chicago, attended the program meeting. Other NBER associates who participated include: Ben Bernanke and Program Director Robert Hall, Stanford University; Robert Gordon and Fumio Hayashi, Northwestern University; Herschel Grossman, Brown University; Julio Rotemberg and Lawrence Summers, MIT; and Christopher Sims, University of Minnesota. Invited guests included: Larry Christiano, Allen Drazen, Gene Fama, Lars Hansen, Roger Kormendi, and Gary Skoog, University of Chicago; Laura La Haye, University of Illinois; John Long, University of Rochester; Kenneth Singleton, Carnegie-Mellon University; and Warren Weber, Virginia Polytechnic Institute.

## Meeting of Monetary Economists

NBER's Program in Financial Markets and Monetary Economics met in Cambridge on October 16 for a discussion of monetary policy control of the monetary aggregates. Five papers were presented:

David Jones, Board of Governors of the Federal Reserve System and NBER, "Lagged versus Contemporaneous Reserve Accounting: Implications for Monetary Control"

Discussant: William L. Silber, New York University and NBER

Bennett T. McCallum, University of Virginia and NBER, and James G. Hoehn, Federal Reserve Bank of Dallas, "Money Stock Control with Reserve and Interest Rate Instruments under Rational Expectations"

Discussant: Robert Shiller, MIT and NBER

Peter A. Tinsley, Board of Governors of the Federal Reserve System, "An Examination of Policy Robustness Using Stochastic Simulation Procedures"

Robert H. Rasche, Michigan State University, "An Investigation of the Accuracy of Monetary Control through Reserve Aggregates"

Discussant: Edward J. Kane, Ohio State University and NBER

Benjamin M. Friedman, Harvard University and NBER, "The Roles of Money and Credit in Macroeconomic Analysis" (NBER Working Paper No. 831)

Jones's paper assesses the likely improvement in monetary control that would accompany a return from the present lagged reserve accounting (LRA) system to contemporaneous reserve accounting (CRA). An analysis of the issue indicates that the degree of improvement depends on the sources and magnitudes of Fed forecast errors and the behavioral structure of the financial system. The empirical evidence suggests that returning to CRA will not appreciably improve the precision of monetary control under an operating procedure that applies to nonborrowed reserves. With total reserves targeting, CRA could significantly improve monetary control over time horizons as long as a month or so. Under the present structure of reserve requirements, total reserves targeting with CRA or LRA would worsen monthly control over M1-B as compared to nonborrowed reserves targeting under LRA.

McCallum and Hoehn conduct a theoretical comparison of the potential effectiveness of interest rate and reserve instruments for controlling the money stock. Their analysis is dynamic and assumes rational expectations. They find that with CRA a reserve instrument provides better monetary control, while with LRA a reserve instrument produces poorer results. "Since the Federal Reserve switched from CRA to LRA in 1968, any subsequent attempts to use a reserve instrument will have yielded poorer monetary control than would have been possible under CRA (or with an interest rate instrument)," they conclude.

Tinsley discusses the use of stochastic simulations in estimating how money markets allocate the uncertainty that may be ascribed to recent and proposed changes in the operating procedures of short-run monetary policy. Analysis of a simplified money-market model and a monthly econometric model show how the volatility of the money stock and the funds rate vary according to the choice of the policy instrument and the reserve accounting procedures permitted by Regulation D. The results suggest that money-stock targets would be difficult to hit with a total reserves instrument unless existing errors in the prediction of reserve requirements were significantly reduced (which may happen when the "uniform and universal" reserve requirements of the Monetary Control Act of 1980 are fully implemented). Also, setting the Fed's discount rate at or above the federal funds rate significantly worsens the targeting performance of nonborrowed reserve policies and is largely irrelevant to the performance of total reserve policies. Finally, preliminary

simulations of the monthly model indicate that a return to contemporaneous reserve requirements may moderately improve the targeting performance of procedures for nonborrowed reserves and may significantly reduce the expected volatility of policies for total reserves.

The Rasche paper investigates a number of questions about the accuracy of monetary control with different reserve aggregates. Rasche shows that endogeneity bias and sensitivity to changes in policy regimes need not destroy the accuracy of controlling monetary growth through the monetary base. Moreover, if monetary growth targets could be expressed in ranges that reflect the accuracy of the control procedure, then hypersensitivity of U.S. financial markets to every movement in the published money numbers could be mitigated substantially or eliminated. Rasche proposes an approach to measuring the variance of forecast errors that could be used in calculating the appropriate ranges of monetary growth. The ranges implicit in Rasche's proposal are larger than those currently in use by the Fed, especially for short time horizons.

Friedman's paper presents an empirical case for a redirection of emphasis in macroeconomic research, and in the formulation of monetary policy, away from the *sole* focus on money. If there were a need to focus on just one financial quantity, Friedman shows, there is no reason to conclude that it should be a monetary rather than a credit aggregate. Given the Federal Reserve's recent willingness to use multiple-target strategies, a plausible solution is to use a credit target in conjunction with a monetary target.

In addition to the authors and discussants, the following NBER program members attended the meeting: Andrew Abel and David Hartman, Harvard University; John Makin, University of Washington; Angelo Melino, University of Toronto; Stewart Myers, MIT; William Poole, Brown University; and John Taylor, Princeton University.

## Tax Researchers Meet

On October 22 and 23, NBER's Program in Taxation, chaired by David Bradford of Princeton University, met in Cambridge and discussed the following papers:

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

Discussant: A. S. Kyle, Princeton University

Joseph Stiglitz, Princeton University and NBER, "Self-Selection and Pareto Efficient Taxation" (NBER Working Paper No. 632)

Discussant: Michael Rothschild, Mathematica and NBER

Bruce Peterson, Northwestern University, "The Personal Tax Bias, Entry Barriers, and Limit Pricing"

Discussant: Stewart Myers, MIT and NBER

Yannis Ioannides, Boston University, and Ryuzo Sato, Brown University, "A General Equilibrium Theory of the Distribution of Wealth, Intergenerational Transfer, and Taxation"

Discussant: Fischer Black, MIT and NBER

Shlomo Yitzhaki, Hebrew University and NBER, "On Two Proposals to Promote Saving"

Discussant: John Shoven, Stanford University and NBER

Alan Auerbach, Harvard University and NBER, "Stockholder Tax Rates and Firm Attributes" (NBER Working Paper No. 817)

Discussant: Jerry Green, Harvard University and NBER

The incorporation of inflation into nominal interest rates plays a prominent role in macroeconomic analysis, and measuring its extent is crucial to an understanding of inflation's effects on our tax system. Standard models predict that inflation should raise interest rates point for point in the absence of taxation and by a significantly greater amount in the presence of a tax system like ours. Summers's paper rejects the former prediction empirically, using data on the 1860-1940 period when tax rates were very low. The latter proposition is also not supported empirically. Summers considers various explanations for his puzzling results, including changes in the productivity of capital and the risk premiums, but finds them unsatisfactory. The paper concludes with the suggestion that the anomalous behavior of interest rates may be a consequence of inflation illusion; this inference is supported by the recent behavior of the stock market.

Stiglitz analyzes a set of Pareto-efficient tax structures and finds that: (1) randomization of tax structures is desirable under certain conditions; (2) if relative wages of individuals of different ability depend upon their relative labor supplies, then an optimal tax structure might involve a negative marginal rate on those with high ability and a positive marginal rate on low-ability individuals; (3) if individual preferences differ, then Pareto-efficient taxation may mean negative marginal tax rates for high incomes; and (4) if wage income is stochastic, the marginal tax rate at the upper end may be 100 percent.

Peterson's paper presents one explanation for large capital requirements being a barrier to entry: imperfections in the capital market that arise because the taxation of dividends makes it more expensive for new firms to raise capital by new equity issues than for established firms to raise capital by retained earnings. He also shows that the tax laws may give large firms an advantage over small ones as potential entrants: small firms may be excluded from undertaking large-scale investments because, under existing tax laws, their average cost of capital is too high.

Ioannides and Sato develop a model in which parents' plans to transfer wealth to their children, on one hand, and individuals' decisions about investing in human capital and saving for retirement, on the other, interact to produce an economywide distribution of wealth. The wealth distribution thus reflects two causes of dispersion: differences among individuals with respect to abili-

ty and to inherited wealth. The chief attractive features of the basic model are, first, that under a specific set of assumptions about individuals' utility functions, all relevant behavioral coefficients can be computed as functions of prices and taste. In particular, both saving for retirement and transfers to offspring are functions of individuals' total discounted lifetime wealth. A second attractive feature is that all associated distributions of interest, such as the distributions, across individuals, of intergenerational transfers, of total discounted lifetime wealth, of interest income, of wage income, and of total personal income belong to a well-known family of distribution functions. This finding conforms with empirical evidence about the skewness (and inequality) characteristics of actual distributions as well as their shape over the range of high values of the corresponding variables.

Yitzhaki described a new technique for extending the tax simulation procedure. The technique enables the investigator to derive the values of the parameters of a tax law in a way that satisfies a variety of constraints (for example, on revenue) or comes as close as possible to specified targets (for example, on not changing the distribution of taxes). His paper describes the technique and then illustrates its use with two tax proposals.

Auerbach develops a model of individual portfolio behavior, demonstrating how and when one might empirically test for investor clienteles sorted by tax rate. He corroborates previous findings supporting a dividend clientele effect but finds no support for sorting by risk, except perhaps indirectly through the debt-assets ratio.

During the second afternoon, J. Gregory Ballentine, Deputy Assistant Secretary for Tax Policy at the U.S. Treasury Department, made an informal presentation to the group on the administration's tax program and proposals for the future.

Other members of the program attending the two-day meeting were: Thomas A. Barthold, Dartmouth College; Dan Feenberg, NBER; David Hartman and Martin Feldstein, Harvard University and NBER; Dan Frisch, University of Washington and NBER; Roger H. Gordon, Bell Laboratories and NBER; Patric Hendershott, Purdue University and NBER; Ravi Kanbur, Princeton University; and Joel Slemrod, University of Minnesota and NBER. It is anticipated that both the paper by Summers and the one by Yitzhaki will become part of the NBER Working Paper series; their availability will be indicated by abstracts published in a future issue of the *NBER Reporter*.

## International Research Discussed

Members of NBER's Program in International Studies met with representatives of U.S. government agencies on October 29 and 30 in Cambridge to discuss issues of common interest and effective ways to communicate research findings. The formal program was:

NBER Program Director William Branson, Princeton University, "U.S.-LDC Interdependence" (NBER Working Paper No. 791)

Jeffrey Sachs, Harvard University and NBER, "LDC Debt: Problems and Prospects"

Paul Krugman, MIT and NBER, "Technology, Trade, and Structural Change"

Edward Leamer, UCLA, "Empirical Study of the Sources of Comparative Advantage"

Peter Hooper and Ralph Tryon, Board of Governors of the Federal Reserve System, "Macroeconomic and Exchange-Rate Effects of an Oil Price Shock under Alternative OPEC Investment Scenarios"

C. Michael Aho and Thomas O. Bayard, Bureau of International Labor Affairs, U.S. Department of Labor, "Issues and Options for U.S. Trade Policy: A Washington Perspective"

Gene Grossman, Princeton University and NBER, and J. David Richardson, University of Wisconsin and NBER, "Issues and Options for U.S. Trade Policy: A Research Perspective"

Branson's paper argues that during the 1970s the U.S. economy has become more interdependent with the newly industrializing countries (NICs) of the developing world. The developing countries have borrowed the OPEC surplus, with the major increases in debt coming in the NICs. They have used the funds to invest and grow, reducing the sensitivity of their growth rates to business cycles in the OECD area. As the NICs have grown, they have rapidly increased their imports of capital goods from the United States; these imports grew in real terms at an 11 percent annual rate from 1973 to 1980. The developing countries' share of U.S. capital-goods exports grew from 32 percent to 42 percent over the same period. At the same time, U.S. imports of consumer goods from the same countries grew rapidly, so that the U.S. economy became increasingly interdependent with the NICs over the 1970s.

Sachs's presentation details the extent of debt of the less developed countries (LDCs). Focusing on the issue of credit-worthiness and the prospects for default in international loans, Sachs then asks what guidelines should govern the oversight and control of private international capital flows to the LDCs.

Krugman explores the role of the "technology factor" in international trade. He suggests that countries can be ranked by level of technology, and that goods can be ranked by technology intensity. Comparative advantage reflects the interaction of the "ladders" of countries and goods—each country finds an export niche depending on its general technological level. The paper looks at the implications for a high-technology country of "catch-up" by other countries and shows that problems are likely both in terms of internal adjustment and international competitiveness.

Leamer looks at net exports as ten aggregates: six natural resource products and four manufacturing commodities. In 1958, the United States exchanged manufactured goods and cereals for the natural resource prod-

ucts. In 1975, the United States exchanged machinery and cereals for petroleum. Both labor-intensive and capital-intensive commodities switched from export to import items. The structure of trade and changes in it can be explained by levels and changes in levels of endowments including capital, human capital, labor, and land. Leamer uses the duality between the Stolper-Samuelson and Rybczynski effects to infer the effects of the post-Kennedy Round of tariff level changes on the wage level and the returns to capital.

Hooper and Tryon investigate the effects of oil price changes on exchange rates, real growth, and inflation, using a five-country econometric model. The model includes an exchange-rate equation that attempts to capture the effects of changes in foreign and domestic wealth. Simulations are run with alternative OPEC earnings rates and with different assumptions about the currency composition of its assets.

The paper by Aho and Bayard presents a Washington policy perspective on the research agenda for the 1980s. They emphasize the unresolved questions in the relationships between trade and exchange rates for traditional welfare calculations; in the changing structure of comparative advantage and the international division of labor; and in the role of immigration in influencing trade structure and competitiveness. The paper also describes some of the most contentious trade policy issues being addressed today in Washington.

Grossman and Richardson's paper integrates results and approaches from research presented at the NBER's 1981 Summer Institute. It discusses the relevance of this research to trade policy issues and options in situations where factor endowments themselves vary in response to trade policy, where the variability of international fluctuations is as important as their trend, and where expectations of such fluctuations, and of the endogenous response of trade policy to them, affect adjustment, injury, and growth.

In addition to the speakers, Washington guests at the meeting were: Harry Bowen, Office of Foreign Economic Research, U.S. Department of Labor; Dean DeRosa, Office of Quantitative Studies, U.S. Department of the Treasury; Asim Erdilec, National Science Foundation; Geza Feketekudy, Office of the U.S. Trade Representative; Haywood Fleisig, International Unit, Congressional Budget Office; Kent Hughes, Joint Economic Committee; Alfred Reifman, Congressional Research Service, Library of Congress; Robert Russell, Senate Committee on Foreign Relations; Jack Sweeney, Office of International Trade, U.S. Department of the Treasury; and Jerry Tempelski, U.S. International Trade Commission. Other NBER participants were: Michael Bruno, Hebrew University; Barry Eichengreen, Martin Feldstein, and David Hartman, Harvard University; Robert Lipsey, Queens College; and Dennis Warner, Michigan State University. Louka Katseli and Colin Bradford, Yale, also attended the two-day meeting.

## Fall Labor Meeting Held

Members and guests of NBER's Program in Labor Studies met in Cambridge on November 6 to discuss their recent and ongoing work. Program Director Richard Freeman, of Harvard University, and Casey Ichniowski, of MIT and NBER, shared the organization and chairmanship of the day-long meeting.

NBER Research Associate Daniel S. Hamermesh, Michigan State University, presented the first paper of the day, "A General Empirical Model of Life-Cycle Effects in Consumption and Retirement Decisions." The paper adds such life-cycle measures as length of horizon, number and spacing of children, and number of other dependent family members to standard empirical models of consumption and labor supply behavior of older workers. After briefly discussing how such variables can affect consumption and retirement choices, Hamermesh examines these choices as recorded in the Terman sample of gifted individuals. A final section of the paper uses data from the Social Security Administration's Retirement History Survey to estimate consumption functions and labor-supply choices for a broader sample of individuals.

The second paper, by Sherwin Rosen of the University of Chicago and NBER, analyzes the distribution of firm size and managerial incomes as the equilibrium outcome of the assignment of personnel to hierarchical positions. The span of control at each rank, and the number of ranks within firms, are endogenously determined; when firms can be decentralized through a mechanism for pricing internal transfers across ranks, an equilibrium solution results. The assignment of persons of superior talent to the top ranks increases productivity by more than the increments of their talents, because superior talent at the top filters down through the entire organization: improvement in productivity of immediate subordinates is transferred to their subordinates and to all successively lower ranks through a recursive chain-of-command technology. The resulting multiplicative effects on overall productivity support enormous rewards for those at the top. Furthermore, superior managers control more than proportionately larger organizations. Consequently the distributions of reward and firm size are skewed relative to the underlying distribution of talent.

After lunch, Harry J. Holzer, of Harvard University and NBER, discussed the employment data tape on minority youth that the Bureau has created. The last presentation was by Joseph G. Altonji of Columbia University and NBER, "The Intertemporal Substitution Model of Labor Market Fluctuations: An Empirical Analysis." This paper analyzes labor-market fluctuations as a response to movements in the real wage relative to expected discounted future wages. Using two quite different approaches to the problem of measuring expectations, Altonji gets consistent results that do not support the intertemporal substitution model. He then constructs an alternative view of the labor market incorporating implicit contracts; this will form the basis for future research.

Other NBER program members who attended the meeting included: Katharine Abraham and Jerry Hausman, MIT; Charles Brown, University of Maryland; David Ellwood, Wayne Gray, Jon Leonard, David Wise, and Richard Zeckhauser, Harvard; Alan Gustman, Dartmouth; Edward Lazear and Robert Topel, University of Chicago; Olivia Mitchell, Cornell; and Kip Viscusi, Duke University. Other participants included: Henry Farber, MIT; Randy Filer, Brandeis; George Johnson, University of Michigan; and Jennifer Roback, Yale.

## Reprints Available

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212. "Flexible Exchange Rates, Prices, and the Role of 'News': Lessons from the 1970s," by Jacob A. Frenkel, 1981 (NBER Working Paper No. 450)
213. "Monetarist Interpretations of the Great Depression: An Evaluation and Critique," by Robert J. Gordon and James A. Wilcox, 1981 (NBER Working Paper No. 300)
214. "Disequilibrium Dynamics with Inventories and Anticipatory Price-Setting," by Jerry Green and Jean-Jacques Laffont, 1981 (NBER Working Paper No. 453)
215. "The Role of Intergenerational Transfers in Aggregate Capital Accumulation," by Laurence J. Kotlikoff and Lawrence Summers, 1981 (Working Paper No. 445)
216. "Time Preference and International Lending and Borrowing in an Overlapping Generations Model," by Willem H. Buiter, 1981 (NBER Working Paper No. 352)
217. "Further Evidence on the Value of Professional Investment Research," by Kenneth L. Stanley, Wilbur G. Lewellen, and Gary G. Schlarbaum, 1981 (NBER Working Paper No. 536)
218. "Energy Resources and Research and Development," by Partha Dasgupta, Richard Gilbert, and Joseph E. Stiglitz, 1980
219. "A Note on Exchange-Rate Expectations and Nominal Interest Differentials: A Test of the Fisher Hypothesis," by Robert E. Cumby and Maurice Obstfeld, 1981 (NBER Working Paper No. 537)
220. "On the Almost Neutrality of Inflation: Notes on Taxation and the Welfare Costs of Inflation," by Joseph E. Stiglitz, 1981 (NBER Working Paper No. 499)
221. "Intraindustry Specialization and the Gains from Trade," by Paul R. Krugman, 1981 (NBER Working Paper No. 356)

222. "Business Cycles and Growth: Some Reflections and Measures," by Victor Zarnowitz, 1981 (NBER Working Paper No. 665)
223. "The Role of Money Supply Shocks in the Short-Run Demand for Money," by Jack Carr and Michael R. Darby, 1981 (NBER Working Paper No. 524)
224. "Monetary Accommodation of Supply Shocks under Rational Expectations," by Alan S. Blinder, 1981 (NBER Working Paper No. 464)
225. "Keynesian Balance of Payments Models: Comment," by Willem H. Buiter and Jonathan Eaton, 1981
226. "The Superiority of Contingent Rules over Fixed Rules in Models with Rational Expectations," by Willem H. Buiter, 1981 (NBER Technical Working Paper No. 9)
227. "The Taxation of Exhaustible Resources," by Partha Dasgupta, Geoffrey M. Neal, and Joseph E. Stiglitz, 1980 (NBER Working Paper No. 436)
228. "Savings and Taxation," by Mervyn A. King, 1980 (NBER Working Paper No. 428)
229. "Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation," by Edward J. Kane, 1981 (NBER Working Paper No. 638)
230. "Rank-Order Tournaments as Optimum Labor Contracts," by Edward P. Lazear and Sherwin Rosen, 1981 (NBER Working Paper No. 401)
231. "Pension Funding, Share Prices, and National Saving," by Martin Feldstein and Stephanie Seligman, 1981 (NBER Working Paper No. 509)
232. "Corporation Finance," by Roger H. Gordon and Burton G. Malkiel, 1981 (NBER Working Paper No. 576)
233. "Investment in Producers' Equipment," by Patric H. Hendershott and Sheng-Cheng Hu, 1981
234. "Macroeconomic Policy, Exchange-Rate Dynamics, and Optimal Asset Accumulation," by Maurice Obstfeld, 1981 (NBER Working Paper No. 599)
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## On the Estimation of Structural Hedonic Price Models

**James N. Brown and Harvey S. Rosen**

Technical Working Paper No. 18

November 1981

Many commodities can be viewed as bundles of individual attributes for which no explicit markets exist. It is often of interest to estimate structural demand and supply functions for these attributes, but the absence of directly observable attribute prices poses a problem for such estimation. In an influential paper published several years ago, Rosen (1974) proposed an estimation procedure to surmount this problem. This procedure has since been used in a number of applications. The purpose of this paper is to point out certain pitfalls in Rosen's procedure, which, if ignored, could lead to major identification problems.

## Bliss Points in Mean-Variance Portfolio Models

**David S. Jones and V. Vance Roley**

Technical Working Paper No. 19

December 1981

JEL No. 026

When all financial assets have risky returns, the mean-variance portfolio model is potentially subject to two types of bliss points. One bliss point arises when a von Neumann-Morgenstern utility function displays negative marginal utility for sufficiently large *end-of-period* wealth, such as in quadratic utility. The second type of bliss point involves satiation in terms of *beginning-of-period* wealth and afflicts many commonly used mean-variance preference functions. This paper shows that the two types of bliss points are logically independent of one another and that the latter places the effective constraint on an investor's welfare. The paper also uses Samuelson's fundamental approximation theorem to motivate a particular mean-variance portfolio choice model that is not affected by either type of bliss point.

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## Current Working Papers

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

## Real Interest Rates, Home Goods, and Optimal External Borrowing

**Rudiger Dornbusch**

Working Paper No. 779

October 1981

JEL No. 400

This paper investigates the optimal time path of consumption and external borrowing in the dependent economy model. The small country faces given world prices and a given world real interest rate. The presence of a home goods sector implies that the relevant real interest rate appropriate to consumption decisions depends on the rate of change of the real price of home goods. This paper shows how transitory disturbances in output or in the world real interest rate affect the time profile of consumption. In particular, it shows that the presence of a home goods sector dampens the consumption effects of changes in interest rates.

## Government and Health Outcomes

**Michael Grossman**

Working Paper No. 780

October 1981

JEL No. 913

In this paper, I summarize the results of empirical studies in the areas of schooling and health, public programs and infant mortality, and government regulation of teenage smoking. My review is selective and is based on my own research. It is neutral with respect to the question of whether the government should pursue policies to improve the health of its citizens, but it calls attention to the consequences on health of alternative decisions by policy makers.

## **Unemployment, Unsatisfied Demand for Labor, and Compensation Growth in the United States, 1956-80**

**James L. Medoff and Katharine G. Abraham**  
Working Paper No. 781  
October 1981  
JEL No. 824

This paper presents two key facts that call into question the value of unemployment rates as barometers of labor market tightness. First, while both unemployment rates and proxies for unsatisfied labor demand perform reasonably well independently in compensation growth equations, only the unsatisfied demand variable appears to matter in models that include both. Second, the outward shifts in Phillips plots of the past decade can, to a substantial degree, be tied to outward shifts in plots pairing the relevant unemployment rate and unsatisfied demand proxies.

The paper also provides results indicating that Phillips relationships that are defined in terms of unsatisfied demand variables appear to be somewhat more stable than those using unemployment rates. Taken together, our findings have a clear message for those concerned with macroeconomic theory and policy: labor market pressure on wages can be more reliably assessed by looking at measures of unsatisfied labor demand than by looking at the unemployment rates on which most earlier analyses have focused.

## **Central Planning and Monetarism: Fellow Travelers?**

**Richard Portes**  
Working Paper No. 782  
October 1981  
JEL Nos. 052, 311

This paper discusses: (1) the monetary institutions and macroeconomics of centrally planned economies (CPEs); (2) objectives and techniques of monetary control; (3) the relevance to CPEs of the neutrality property, the natural rate hypothesis, and the quantity theory; (4) the roles of stock and flow variables and the stability of asset demand and expenditure functions; (5) the relation between monetary policy, fiscal policy, and incomes policy in CPEs; (6) the CPE equivalent of a floating exchange rate and its implications for monetary policy; and (7) "super crowding out." Many considerations suggest that monetarism as theory and policy might be more applicable under central planning than it is in market economies.

## **Seigniorage and Fixed Exchange Rates: An Optimal Inflation Tax Analysis**

**Stanley Fischer**  
Working Paper No. 783  
October 1981

A country that decides to fix its exchange rate thereby gives up control over its inflation rate and the determination of revenue received from seigniorage. If the country goes further and uses a foreign money, it loses all seigniorage. This paper uses an optimal inflation tax approach to analyze the consequences of the alternative exchange rate and monetary arrangements for optimal rates of income taxation and welfare. From the viewpoint of seigniorage, a system in which the country is free to determine its own rates of inflation is optimal; fixed exchange rates are second best; and the use of a foreign money is the worst. The paper notes that seigniorage is only one of the factors determining the choice of an optimal exchange-rate regime, but it also points out that rates of seigniorage collection are high, typically accounting for five or more percent of government revenue.

## **Domestic Tax Policy and Foreign Investment: Some Evidence**

**David G. Hartman**  
Working Paper No. 784  
October 1981  
JEL Nos. 323, 411

Investment abroad has come to play a major role in the total investment of U.S. firms. Despite this development, very little attention has been paid to the impacts of domestic tax policy on foreign investment.

One reason has been the presumption that, since changes in domestic tax rules ordinarily also apply to foreign-source income, policy changes should affect foreign and domestic investment similarly. However, the fact that the tax on foreign-source income is deferred until the income is repatriated represents a crucial difference in the treatment of foreign and domestic income. So long as the U.S. tax is deferred, the effective U.S. tax rate on foreign-source income can be shown to be irrelevant to a firm's optimal foreign reinvestment decision. Foreign investment is now largely accomplished by firms reinvesting earnings abroad, so the reinvestment decision is of primary importance. Thus, a decrease in the effective U.S. tax rate that applies to both domestic and foreign investment income can be thought of as a cut in the tax on domestic investment income, thus encouraging domestic investment (perhaps at the expense of foreign investment), combined with a cut in the tax on foreign investment income, with no effect on the optimal foreign reinvestment decision. Consequently, the impacts on foreign and domestic investment of an apparently neutral policy could be very different.

Another reason that the response of foreign investment has been neglected in domestic policy discussions is the lack of evidence on the magnitude of that response. This paper utilizes the theory just described to confirm that foreign investment is influenced negatively and quite strongly by the aftertax rate of return to domestic investment. A further test, in which a "gross domestic rate of return" term and a "domestic tax" term are included separately, produces coefficients virtually equal in absolute value, confirming that the net domestic rate of return is the appropriate variable. The results indicate that a tax incentive that has been found to raise net domestic investment by a dollar reduces net foreign investment by at least twenty cents. This conclusion is further reinforced by results from a forward-looking (Tobin's  $q$ ) model.

While these results do not point to the *primary* outcome of a domestic policy change being a domestic-foreign reallocation of the capital stock, they indicate that a significant reallocation does take place. With open-economy tax analysis still in its infancy, the question of how this evidence alters the usual conclusions is largely an open one.

### **Real versus Financial Openness under Alternative Exchange-Rate Regimes**

**Michael Bruno**

Working Paper No. 785  
October 1981

I use a simple analytical framework to consider alternative exchange-rate regimes and their bearing on macroeconomic management of a semi-industrial economy. The implications of different degrees of capital mobility are emphasized. One of the topics taken up is the conflict between the role of the real exchange rate as a signaling device for long-run resource allocation and the problem of real exchange-rate appreciation that accompanies the opening up of an economy to short-term capital inflow. The related choice of exchange-rate policy as an anti-inflation device is also discussed.

### **Patents, R and D, and the Stock Market Rate of Return**

**Ariel Pakes**

Working Paper No. 786  
October 1981

This paper presents and estimates a model that allows one to use the recently computerized data base of the U.S. Patent Office to identify when and where changes in inventive output have occurred. The model assumes a

firm that chooses a research strategy to maximize the expected discounted value of the net cash flows from its activities, and a stock market that evaluates this expectation at different dates (it is a version of the Lucas-Prescott investment model, 1971). Patents are an indicator of the output of the firm's research laboratories. These assumptions place a set of testable restrictions on the stochastic process generating patents, R and D, and the stock market rate of return on the firm's equity (the econometric framework used is that of a restricted index, or dynamic factor-analysis model). The data contain observations on these three variables for 120 firms over an eight-year period. The model fits these data quite well and the final section reports on the implications of the parameter estimates.

### **Should Private Pensions Be Indexed?**

**Martin Feldstein**

Working Paper No. 787  
October 1981  
JEL Nos. 521, 915

The analysis in this paper was motivated by the apparent puzzle that, despite substantial uncertainty about future inflation rates, private pensions are almost universally unindexed. Moreover, although a variable annuity invested in short-term money market instruments provides a good inflation hedge, almost all private pensions provide a fixed annuity.

The results of the analysis indicate that the existence of unindexed pensions and fixed annuities is not at all surprising. Even without Social Security, it may be optimal to have a completely unindexed private pension and it is generally not optimal to have a completely indexed pension.

The availability of an optimal (or greater than optimal) amount of Social Security generally reduces the desired degree of indexing and, under a variety of conditions, makes it optimal to have no indexing at all in the private pension.

Because unexpected changes in the price level do not alter the value of Social Security pensions, the existence of inflation uncertainty makes a Social Security pension optimal when it would not otherwise be. An increase in inflation uncertainty is likely to increase the optimal reliance on Social Security. Despite these conclusions, the analysis shows that including some Social Security in an overall pension program is necessarily optimal only when both money market instruments and Social Security have rates of return that are known with certainty. When the real yield on money market instruments is uncertain, the optimal pension arrangement may be a partially indexed private pension, even though Social Security is risk-free and has a return that is higher than the expected rate on the money market instruments. Similarly, when Social Security is risky, the optimal arrangement may be to exclude Social Security and to use a partially indexed private pension. In all cases, an individual who has a low enough degree of risk aversion will prefer no Social Security and a completely unindexed private pension.

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## **Stochastic Problems in the Simulation of Labor Supply**

**Jerry A. Hausman**  
Working Paper No. 788  
October 1981

Modern labor supply studies attempt to account for nonlinear budget sets created by government tax and transfer programs. Progressive taxation leads to nonlinear convex budget sets while the earned income credit, Social Security contributions, AFDC, and the proposed NIT plans all lead to nonlinear, nonconvex budget sets. Where nonlinear budget sets occur, the expected value of the random variable, labor supply, can no longer be calculated by simply plugging in the estimated coefficients. Properties of the stochastic terms that arise from the residual, or from a stochastic preference structure, need to be accounted for. This paper considers both analytical approaches and Monte Carlo approaches to the problem. I attempt to find accurate and low-cost computational techniques that would permit extensive use of simulation methodology. Large samples are typically included in such simulations, which makes computational techniques an important consideration. But these large samples may also lead to simplifications in computational techniques because of the averaging process used in the calculation of simulation results. This paper investigates the trade-offs between computational accuracy and cost in simulation exercises over large samples.

## **Does Anticipated Aggregate Demand Policy Matter? Further Econometric Evidence**

**Frederic S. Mishkin**  
Working Paper No. 789  
October 1981  
JEL Nos. 310, 130,

A heated debate has arisen over what Modigliani has dubbed the Macro Rational Expectations (MRE) hypothesis. This hypothesis embodies two component hypotheses: (1) rational expectations, and (2) short-run neutrality—that is, that anticipated changes in aggregate demand, having already been taken into account in economic agents' behavior, will thus evoke no output or employment response. Together these component hypotheses imply that deterministic feedback policy rules will have no effect on business cycle fluctuations. The irrelevance of these types of policy rules is inconsistent with much previous macro theorizing as well as with the views of policy makers. It is thus an extremely controversial proposition that requires a wide range of empirical research.

This paper is a sequel to a previous paper by the author that developed a methodology for testing the MRE hypothesis and found that anticipated money growth does matter to the business cycle. Here the analysis is extended to cases where the rate of growth of nominal GNP or

the inflation rate, rather than money growth, is the aggregate demand variable. The empirical results are also negative on the MRE hypothesis and its corresponding policy ineffectiveness proposition.

## **Time-Series Evidence of the Effect of the Minimum Wage on Youth Employment and Unemployment**

**Charles Brown, Curtis Gilroy, and Andrew Kohen**  
Working Paper No. 790  
October 1981  
JEL No. 820

While previous time-series studies have quite consistently found that the minimum wage reduces teenage employment, the extent of this reduction is much less certain. Moreover, because few previous studies report results of more than one specification, the cause of differences in estimated impacts is not well understood. Even less consensus is observed on the effect of the minimum wage on teenage unemployment, or the relative impact on black or white teenagers.

The purpose of this paper is to update earlier work and to analyze the sensitivity of estimated minimum wage effects to alternative specification choices. In addition to providing estimates of the effect of minimum wage increases on aggregate employment and unemployment rates of teenagers, we explore several related issues: (1) the relative importance of changing the level and coverage of the minimum wage; (2) the timing of responses to a change in the minimum; (3) effects on part-time and full-time work; and (4) effects on young adults (ages 20–24).

## **The OPEC Surplus and U.S.-LDC Trade**

**William Branson**  
Working Paper No. 791  
November 1981  
JEL Nos. 421, 441

This paper explores the connections between the shift of world saving toward OPEC and the changing structure of U.S. trade with the developing countries that produce no oil. The basic point of the paper is that during the 1970s, the U.S. economy became more interdependent through trade with the newly industrializing countries (NICs) in the developing world. The shift of world saving toward OPEC in the 1970s effectively internationalized the supply of saving, as OPEC places its surplus in the international financial system. The NICs and other developing countries borrow the surplus and direct it to domestic investment. Investment in the NICs stimulates the demand for U.S. capital goods. The reallocation of U.S. resources toward production of capital goods stimulates excess demand for consumer goods, which appear as imports from the NICs. U.S. exports of capital goods

to these countries grew rapidly in the 1970s, as did U.S. imports of nonfood, nonauto consumer goods from them. Thus the structure of U.S. trade has been reoriented to become complementary with the rapidly growing developing countries, and perhaps more competitive with Europe and Japan.

## **Intergenerational and International Trade**

**Rudiger Dornbusch**

Working Paper No. 792

October 1981

JEL Nos. 400, 410

The paper presents an overlapping generations model in an open-economy context. In the absence of productive capital, a real consol is the vehicle for smoothing intertemporal consumption. The presence of a long-term asset implies that the anticipated future path of the economy, through the term structure of interest, affects current generations.

The model is applied to issues in the closed and open economy, including the effects of debt issue on asset prices and welfare, and the effect of present or anticipated growth of future income, either permanent or transitory. In the open-economy context, I investigate the welfare and current-account effects of income changes on debt issue and the role of international differences in risk aversion.

## **Wages, Relative Prices, and the Choice between Fixed and Flexible Exchange Rates**

**Richard C. Marston**

Working Paper No. 793

October 1981

JEL No. 430

This paper reexamines the choice between fixed and flexible rates, taking into account wage indexation and flexible prices. The model is of a small open economy faced by monetary and aggregate demand disturbances originating at home and abroad. Aggregate supply behavior in this model varies depending upon whether wages are set in one-period labor contracts or are indexed to current changes in the general price level.

Two central conclusions emerge from the analysis. First, for all disturbances, the difference in output variation between fixed and flexible rates is dependent upon the degree of wage indexation, being proportional to one minus the degree of wage indexation in the domestic economy. Thus, the more highly indexed the economy, the less difference the choice of exchange-rate regime makes to output variation. Second, the effect of foreign disturbances on the domestic economy depends as much on foreign wage and price behavior as on domestic. If the rest of the world is fully indexed, flexible rates insulate the domestic country completely from foreign monetary disturbances. If the rest of the world is more highly

indexed than the domestic country, then for high price elasticities, at least, a flexible rate dampens the output variation associated with foreign demand disturbances.

## **Trade and Protection with Multistage Production**

**Avinash Dixit and Gene M. Grossman**

Working Paper No. 794

November 1981

This paper analyzes trade in manufactured goods made by a vertical production structure with many stages, where some value is added at each stage to yield a good-in-process ready for the next stage. We consider the stage at which a good is traded to be an economically endogenous variable, with comparative advantage determining the pattern of production specialization by stages across countries. We study how endowment changes and policy shifts move the margin of comparative advantage, which thus provides an additional channel for adjustment of resource allocation to the usual factor substitution and changes in the quantity of output.

## **Women, Children, and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses**

**Claudia Goldin and Kenneth Sokoloff**

Working Paper No. 795

November 1981

JEL No. 040

The first half of the nineteenth century was a critical juncture for the emergence of female participation in the market economy, the increase in the wage of females relative to adult males, and the evolution of large-scale firms in both mechanized and nonmechanized industries. We present the first systematic and comprehensive description of these events as they evolved in the states of the Northeast up to 1850. Our sources are primarily samples taken from three early censuses and reports of manufacturing: 1820, 1832, and 1850.

Our principal findings are: (1) that women and children composed a large share (over 40 percent in 1832) of the entire manufacturing labor force during the initial period of industrialization in the United States, but that this share began a secular decline as early as 1840; (2) that the wage of females (and boys) relative to that of adult males rose wherever large-scale manufacturing establishments spread and that by 1850 this ratio had risen to almost 90 percent of its long-term level; (3) that in 1832 the labor force participation of young, unmarried women in the industrial counties of the Northeast was high by late nineteenth-century standards; and (4) that the employment of females and boys was closely associated with production processes used by large-scale establishments. Women and children had been a previously

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underutilized and large segment of the potential labor force, and their harnessing by manufacturing was a critical factor in the industrialization of the Northeast.

## **The Current Account in the Macroeconomic Adjustment Process**

**Jeffrey Sachs**

Working Paper No. 796

November 1981

JEL Nos. 431, 441

This paper provides a formal analysis of the current account balance in a dynamic model with optimizing agents. Two analytical ideas are stressed. First, an economy's current account balance depends as much on future economic trends as on the current economic environment. A shift in fiscal policy, for example, will have one effect on the current account if it is perceived to be temporary and another if it is seen to be permanent. Second, temporary disturbances in the economy have permanent effects, by altering the entire future path of the economy's international indebtedness.

## **Tariffs as Insurance: Optimal Commercial Policy When Domestic Markets Are Incomplete**

**Jonathan Eaton and Gene M. Grossman**

Working Paper No. 797

November 1981

Free trade is not optimal for a small country that faces uncertain terms of trade if some factors are immobile ex post, and markets for contingent claims are incomplete. The government can improve social welfare by using commercial policy that serves as a partial substitute for missing insurance markets. Using a combination of analytical and simulation techniques, we demonstrate that optimal policy for this purpose will often have an anti-trade bias. We also show that the usual preference by economists for factor or product taxes and subsidies over tariffs and export subsidies may not be justified in this context.

## **Issues in the Taxation of Foreign Source Income**

**Daniel J. Frisch**

Working Paper No. 798

November 1981

This paper examines some aspects of the tax treatment of U.S. multinational corporations. The emphasis is on

problems faced by the firms in coordination of the different tax systems. The U.S. corporate income tax must take account of the fact that the firms' overseas income is taxed in a variety of ways by the host governments. Currently, the foreign tax credit is the principal mechanism for making adjustments; it is examined, along with alternative methods such as territorial treatment and a deduction for foreign taxes. The paper also considers the closely related question of coordinating measures of taxable income. The most common method, the arm's-length rule, is examined. Alternatives to it, including allocation by shares and a partial case involving allocation of research and development expenses, are also considered.

First, the revenue effects of these tax regimes are simulated, with no behavioral responses considered. Responses in location-of-investment decisions are then included. The data are taken from the corporations' U.S. tax returns, cross-tabulated into approximately 240 industry and country cells.

## **A General Equilibrium Model of Taxation with Endogenous Financial Behavior**

**Joel Slemrod**

Working Paper No. 799

November 1981

JEL No. 323

This paper presents and utilizes a new, general equilibrium simulation model of capital income taxation. Its chief advantage over existing models of the effects of taxation is that it recognizes that agents may adjust their financial behavior in response to changes in the way that capital income is taxed. Integrating a structural treatment of portfolio choice and financial markets into a standard multisector model of taxation, this model can trace the general equilibrium impact of these financial adjustments and calculate the tax-induced changes in the allocation of factors and output as well as the distributional effects of any tax change.

The model is used to simulate the impact of completely indexing the tax system for inflation. The results indicate there would be significant financial adjustment in response to indexing. A large shift in the distribution of private riskbearing accompanies a slight reallocation of the capital stock away from owner-occupied housing toward its other uses and a substantial change in the ownership of the housing stock by income class. All in all, indexing the tax system of an economy such as ours in 1977 would have led to an efficiency gain, slightly hurt the lowest-income classes, and substantially improved the welfare of the highest-income groups. The simulation results should, however, be considered tentative because of uncertainty about the values of several parameters and the relatively simple formulations of the determinants of portfolio choice and the U.S. financial structure.

## **"Double Dipping": The Combined Effects of Social Security and Civil Service Pensions on Employee Retirement**

**Garry Burtless and Jerry A. Hausman**

Working Paper No. 800

November 1981

JEL No. 820

We consider the retirement behavior of civilian employees of the U.S. government. Unlike previous studies, this investigation is based upon a data set containing fairly complete and accurate information about the Social Security and employer-provided pensions for which employees are (or ultimately will be) eligible. These data permit us to specify the financial aspects of individual retirement decisions with a reasonable degree of precision. A large fraction of civil service pensioners is eligible to receive Social Security benefits because a part of their working careers was spent in Social-Security-covered employment. The prevalence of double pension coverage among government employees has raised serious equity questions about the treatment of civil servants by Social Security, and these questions have led to various suggestions for pension reform. Partly, the reform proposals have been put forward because of the perceived unfairness of "double dipping" that arises from the double pension coverage of government employees.

Our analysis finds: (1) Both the amount of a federal pension entitlement and the expected wait until the pension commences affect the timing of retirement from the federal service. (2) The rate of anticipated wage growth significantly affects individual decisions to remain in federal employment. (3) Workers who are ultimately eligible to receive Social Security in some cases show a different pattern of retirement than do workers not vested in Social Security. However, our analysis does not reveal any massive shift of federal workers into Social-Security-covered employment in order to benefit from the "tilt" in the Social Security formula.

## **Macroeconomic Determinants of Real Exchange Rates**

**William H. Branson**

Working Paper No. 801

November 1981

This paper presents a model that integrates money, relative prices, and the current account balance as factors behind movements in nominal (effective) exchange rates. Thus, money and the current account are the proximate determinants of changes in real (effective) rates.

The basic model is first analyzed under static expectations. It is an extension of my earlier work that includes explicitly exogenous disturbances to the current account. Next, rational expectations are introduced, and it is shown that the nominal (and real) rate should be expected to jump instantaneously in response to new information or "innovations" in money, the current account, and relative prices.

The model is applied to the quarterly data on effective exchange rates, relative prices, money, and the current account for four countries—the United States, the United Kingdom, Germany, and Japan—since 1973. First, the time-series properties of the data are described. All are approximately first-order autocorrelations *except* all relative prices, and Japan's effective exchange rate and current account balance; these are second-order autocorrelations. Then vector autoregressions (VARs) are estimated among the four variables for each country. The residuals from these equations are the "innovations" in the data—the current movements not predicted by the past. The correlations among these innovations are consistent with the theory.

The broad conclusion from the paper is that the theoretical model that integrates money, the balance on current account, and relative prices is consistent with movements in these variables since 1973. Real exchange rates adjust to real disturbances in the current account, and time-series innovations in the current account seem to signal the need for adjustment.

## **Public Goods in Open Economies with Heterogeneous Individuals**

**Joseph E. Stiglitz**

Working Paper No. 802

November 1981

JEL No. 320

This paper formulates a simple model of "perfect community competition." It is shown that: (1) the equilibrium is Pareto optimal; (2) communities will, in general, be heterogeneous—not all individuals will have the same tastes; (3) all individuals of a given skill within the community will have identical preferences; (4) in spite of the heterogeneity of tastes, there is complete unanimity with respect to tax and expenditure policy, and there is no scope for redistribution at the local level; (5) under certain circumstances, everyone's expected utility can be increased by introducing a particular kind of unequal treatment of individuals who are otherwise identical with respect to tastes and production characteristics; and (6) when there is not "perfect community competition," the equilibrium will, in general, not be Pareto optimal, and benefit taxation may be desirable.

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## Human Capital and Economic Growth

**Jacob Mincer**

Working Paper No. 803

November 1981

JEL No. 800

Individuals differ in both inherited and acquired abilities, but only the latter differ among countries and time periods. The analysis of human capital deals with acquired capabilities developed through formal and informal education, at school and at home, and through training, experience, and mobility in the labor market.

Just as accumulation of personal (human) capital produces individual economic (income) growth, so do the corresponding social or national aggregates. At the national level, human capital can be viewed as a factor of production along with physical capital. This implies that its contribution to growth is greater as the volume of physical capital increases, and vice versa. The framework of an aggregate production function shows also that the growth of human capital is both a condition and a consequence of economic growth.

Human capital activities involve not merely the transmission and embodiment in people of available knowledge, but also the production of new knowledge, one source of innovation and of technical change, which propels all factors of production. This latter function of human capital generates worldwide economic growth regardless of its initial geographic locus.

Contrary to Malthus, economic growth has not been eliminated by population growth. Indeed, spatial and temporal patterns of the "demographic transition" appear to be congruent with economic growth. Human capital is a link that enters both the causes and effects of these economic-demographic changes.

## The Economics of Wage Floors

**Jacob Mincer**

Working Paper No. 804

November 1981

JEL No. 800

This paper contains a theoretical analysis and summaries of empirical information on the consequences of wage floors in the labor market as imposed by minimum wages and labor unions.

Excess supplies are rationed in part probabilistically (first come, first served), and in part systematically—by raising hiring standards, or by discrimination and nepotism. Effects on employment, unemployment, and labor force participation, and on wage differentials between the "covered" and the free sector, follow. Empirical information on these effects is cited in the minimum-wage case, but only wage differentials are analyzed in the union context.

Other consequences outlined here are: lengthening of school attendance, reduction of hours of work, and sub-

stitution of paid-out wages for fringes in the minimum-wage case. However, union pressure is greater on fringes than on wages. This strategy produces larger income and greater job security for union members.

The minimum wage reduces opportunities for job training and consequent wage growth. As wages are pushed up, quits initially decline, but turnover is likely to increase as the training content of jobs is reduced. Union wage and fringe advantages reduce quits significantly but also reduce training and wage growth.

## Compensating Wage Differentials for Mandatory Overtime

**Ronald G. Ehrenberg and Paul L. Schumann**

Working Paper No. 805

November 1981

JEL No. 820

Our paper estimates the extent to which employees are compensated with higher straight-time wages for an unfavorable job characteristic, being required to accept mandatory assignment of overtime. Our estimating equations are derived from a model in which wage rates and the existence of mandatory assignment of overtime are jointly determined in the market by the interaction of employee and employer preferences. While, *on average*, we do not observe the existence of a compensating wage differential for mandatory overtime, we do observe the existence of such differentials for unionized workers and workers with only a few years' experience at a firm.

Given any estimated compensating wage differential for an unfavorable working condition, one must decide whether it is large enough that it *fully* compensates workers for the disutility of being subject to the unfavorable working condition. We develop and illustrate a methodology that can be used to answer this question, at least for the case of mandatory overtime provisions and other rules that restrict employees' choice of hours.

## Evaluating the Taxation of Risky Assets

**Alan J. Auerbach**

Working Paper No. 806

November 1981

JEL Nos. 323, 520

This paper explores the taxation of risky assets, both from the theoretical perspective of optimal taxation and from the practical one of measuring "the" tax rate on an asset when, as under existing practice, its stochastic returns are subject to differential tax treatment across states of nature. The results suggest that it may be "appropriate" for tax rates to vary systematically with the riskiness of an asset but that use of the expected tax rate to evaluate the characteristics of any particular tax system may be very misleading.

## **A Positive Theory of Monetary Policy In a Natural Rate Model**

**Robert J. Barro and David B. Gordon**  
Working Paper No. 807  
November 1981

Natural rate models suggest that the systematic parts of monetary policy will not have important consequences for the business cycle. Nevertheless, we often observe high and variable rates of monetary growth and a tendency for monetary authorities to pursue countercyclical policies. This behavior is consistent with a rational expectations equilibrium in a discretionary environment where the policy maker pursues a "reasonable" objective but cannot make precommitments on monetary growth. At each point in time the policy maker optimizes, subject to given inflationary expectations that determine a Phillips curve type trade-off between monetary growth/inflation and unemployment. Inflationary expectations are formed with the knowledge that policy makers will be in this situation. Accordingly, equilibrium excludes systematic deviations between actual and expected inflation, so that the equilibrium unemployment rate ends up independent of "policy" in our model. However, the equilibrium rates of monetary growth/inflation depend on various parameters, including the slope of the Phillips curve, the costs attached to unemployment versus inflation, and the level of the natural unemployment rate. The monetary authority determines an average inflation rate that is "excessive" and also tends to behave countercyclically. Outcomes improve if a costless operating rule is implemented to precommit future policy choices in the appropriate manner. The value of these precommitments—that is, of long-term agreements between the government and the private sector—underlies the argument for rules over discretion. Discretion is the subset of rules that provides no guarantees about the government's future behavior.

## **Union Effects: Wages, Turnover, and Job Training**

**Jacob Mincer**  
Working Paper No. 808  
November 1981  
JEL No. 800

This study explores the existence of a "net union premium" and the extent of rationing by quality of the excess supply that results from it. The net union premium is estimated first by relating changes in wages to changes in union status of the same worker in longitudinal panels (NLS and MID). Then it is estimated, using two cross-section, wage-level regressions, a "prospective" and a "retrospective," that permit more direct observation of selectivity in hiring. Over half of the cross-section differential—over 20 percent for the "same" (standardized)

worker—is a net union rent. Much of the rest of the differential reflects a quality adjustment in hiring, as measured by wages. (This latter conclusion is less reliable for older workers.)

The paper then explores the effects of successful union wage pressure on quit rates, fringe benefits, wage profiles, and training. The reduction in quits of union joiners depends on the size of the net wage premium. Differentials among quit rates are also positively related to the gross, cross-section wage differentials within groups of workers classified by location and occupation, but less so when classified by industry.

In Section 4, I hypothesize that imposing larger fixed labor costs (such as fringes) helps to deter employers from preferring reduced hours to reduced labor. It also helps to stabilize employment in the face of fluctuating demand, by more frequent use of overtime and temporary layoffs in the union sector. This hypothesis links the size of fringe benefits to the union wage gain; an analysis of firms in 70 industries confirms this link.

Union pressure is exerted on the whole tenure profile of wages. The explicit linking of wage levels to seniority reduces incentives for worker investment in general (transferable) training. The total volume of training is indeed reported to be smaller in union jobs, and this is consistent with the flatter profile.

## **Why U.S. Wage and Employment Behavior Differs from That in Britain and Japan**

**Robert J. Gordon**  
Working Paper No. 809  
November 1981  
JEL Nos. 023, 041, 045, 123, 131, 820, 833

This paper argues that rigid wages alone cannot provide the underpinnings of a universally valid theory of the business cycle, simply because wages are not universally rigid. Several different statistical techniques suggest that wage rates in the United Kingdom and Japan have been between three and fifteen times more flexible than in the United States during the postwar period. Corresponding to greater flexibility in wages, employment behavior in these two countries also has been more stable over the business cycle.

In historical data covering the period between the late nineteenth century and 1940, U.S. wage behavior appears to be much more similar to that in Britain and Japan. The contrast between the prewar data and the postwar data, where the United States is a definite outlier, suggests that the 1948 invention of the three-year staggered U.S. wage contract may be the crucial factor underlying sluggish U.S. postwar wage dynamics.

A theoretical section attempts to distill from recent literature those features of labor market institutions that are regarded as optimal by economic theory. Japanese institutions exhibit more similarity to this theoretical

paradigm than those in the United States or United Kingdom. Economic theory predicts that long-duration contracts, like those in the postwar United States, are more likely to emerge when the perceived cost of renegotiation is high; but we must appeal to history and cultural differences to explain why conflict avoidance plays a more prominent role in the development of Japanese labor market institutions than in the American case. In this comparison Britain is the odd-man-out, with well-publicized industrial strife, together with short contract durations. I appeal to history, the different legal tradition, and the nature of the British unions themselves to explain why the three-year contract became established in America but not in Britain.

## **Secular Patterns in Corporate Finance**

**Robert A. Taggart, Jr.**  
Working Paper No. 810  
December 1981  
JEL No. 521

Trends in the financing of the corporate sector have been widely discussed in both business and academic circles. It is frequently argued, for example, that corporations' use of debt financing has increased dramatically in recent years. These discussions have been hampered, however, by the lack of a unified theoretical framework. In this paper, an attempt is made to develop such a framework using existing corporate finance theory and some extensions thereof. This theory is then used to interpret available data on aggregate corporate financing patterns over the course of the twentieth century.

It is found that corporations' use of debt has undeniably increased in the post-World War II period. Nevertheless, the relative corporate debt level was unusually low in the 1940s and current debt levels are not unprecedented when viewed in the context of the entire century. The tax system, in conjunction with inflation, has probably played an important role in the postwar increases in corporate debt, but these factors appear insufficient to explain longer-term trends. It is argued, then, that supplies of competing securities, such as federal government bonds, as well as the secular development of the financial intermediary system, may also be important determinants of long-run corporate financing patterns.

## **Pensions and Mortality**

**Paul J. Taubman**  
Working Paper No. 811  
December 1981  
JEL Nos. 915, 315

Pensions and age-specific death rates are intertwined in several ways. For example, pensions provide a mechanism for removing the uncertainty of date of death when planning consumption. Age-specific death rates also determine the cost and value of pensions.

In this paper, I use the Retirement History Survey to estimate reduced-form functions for the probability of having a pension when a person reaches 65 and the dollar amount of that pension. I also evaluate the effect of a 15 percent drop in age-specific death rates from 1973 to 1979 on the costs of a pension.

I find that the probability of having a pension is related to education, marital status, occupation, industry, and assets. The probability equation is very similar for males and females. I also find, though, that the sharp drop in death rates has only a marginal impact on the cost of providing a pension.

## **Employment Effects of the Federal Minimum Wage**

**John Boschen and Herschel Grossman**  
Working Paper No. 812  
December 1981  
JEL No. 824

This is an empirical study of the effects of federal minimum wage policy on aggregate employment, on the employment of various demographic groups, and on employment in low-wage industries. The analytical framework permits separate testing for: (1) direct employment effects of the level and coverage of the minimum wage; and (2) indirect employment effects resulting from a possible role of the minimum wage as a cause of monetary nonneutrality. Another innovation is the inclusion of rational expectations of future relative minimum wages as a determinant of the demands and supplies of labor services.

The study finds that minimum-wage policy seems *not* to affect aggregate employment or average wages either directly or indirectly. Minimum-wage policy, however, has large and statistically significant effects on the industrial and demographic composition of employment, with employment decreasing in certain low-wage industries and for teenagers and young men but increasing for young women and adults. A major part of these effects is associated with anticipated future changes in the level of the minimum wage.

## **Health Care Incentives under Disability Insurance**

**Frederic Slade**  
Working Paper No. 813  
December 1981  
JEL No. 913

This paper examines one of the factors that may have contributed to the significant recent growth in the Social Security Administration's Disability Insurance program: health care incentives. The examination of health care incentives involves a two-period, two-state insurance model under uncertainty that incorporates two general types of insurance: disability insurance and the individual's "own" insurance, or own riskbearing, represented by

acute-care and preventive-care expenditures. The model predicts a positive effect of disability insurance on acute care, while the extent to which disability insurance discourages preventive care depends largely on the effect of preventive care on the price of disability insurance.

Regression estimates using data from the 1969 Longitudinal Retirement History Study (LRHS) indicate an elasticity of prescription drug expenditures (acute care) of about 0.5 with respect to benefits, and an elasticity of use of X-rays and inoculations (preventive care) of about -0.004 with respect to benefits.

## **Adjustment and Structural Change under Supply Shocks**

**Michael Bruno**

Working Paper No. 814  
December 1981

This paper analyzes the resource-boom and input-price effects of changes in raw material prices within a two-period, two-sector (plus resource industry), open-economy framework. It also uses diagrammatic exposition to study the "Dutch disease": particularly the distinction between the short-term effects on wealth (that cause a real appreciation and a movement of variable factors from tradable to nontradable industries) and the long-run effects on total investment, its sectoral allocation, and its finance by foreign borrowing. The framework further enables analysis of the different allocational effects of temporary versus permanent increases in raw material prices, when the two sectors differ in use of materials. The effects of changes in the world interest rate on factor allocation and foreign borrowing, and the allocational effects of government intervention in the case of temporary real wage rigidity, are also discussed.

## **Compliance with the Overtime Pay Provisions of the Fair Labor Standards Act**

**Ronald G. Ehrenberg and Paul L. Schumann**

Working Paper No. 815  
December 1981  
JEL No. 820

Our paper presents a methodology that can be used to estimate the extent of noncompliance with the overtime pay provisions of the Fair Labor Standards Act (FLSA). The methodology is applied to data from the May 1978 Current Population Survey and the 1977 Michigan Quality of Employment Survey. These data suggest that the fraction of covered employees working overtime who fail to receive a premium of at least time-and-a-half, as called for by the legislation, is in the range of 25 percent. They

also suggest that the extent of noncompliance is greater in those industries in which size-class exemptions to the legislation exist (retail trade and selected service industries). Finally, probit analyses of the determinants of noncompliance suggest that decisions about whether to comply with the overtime provisions of the FLSA are at least partially based on the associated benefits and costs.

## **Troubled Workers in the Labor Market**

**Richard B. Freeman**

Working Paper No. 816  
December 1981  
JEL No. 824

This paper seeks to discover the criteria by which workers are judged to be "troubled," to examine the severity of the economic problems facing "troubled" groups, and to determine whether the condition of these people is relatively permanent or the result of transitory setbacks. The paper provides a broad overview of some of the literature on troubled groups in the labor market and puts forth several basic propositions about such groups. Among the facts that emerge are: (1) many workers at the bottom of the income distribution are *permanently* plagued by problems of low earnings; (2) workers who drop substantially in the earnings distribution do not recover their previous economic positions; and (3) personal, *unobserved* characteristics are important factors in the labor market problems of individuals. Additionally, areas with high rates of unemployment tend to experience these rates for a decade or more, classifying most regional differences in unemployment as permanent rather than transitory.

## **Stockholder Tax Rates and Firm Attributes**

**Alan J. Auerbach**

Working Paper No. 817  
December 1981  
JEL Nos. 323, 521

This paper develops a rigorous theoretical model to assess when investor clienteles may be identified empirically using ex dividend day data and to what firm attributes these clienteles should respond. It then presents empirical results for 1963-77, suggesting that: (1) tax-based investor clienteles do exist and are reasonably stable over time; and (2) these clienteles are strongly influenced by the dividend-price ratio but insignificantly by direct measures of risk and other firm characteristics.

## **Real Interest, Money Surprises, and Anticipated Inflation**

**John H. Makin**

Working Paper No. 818

December 1981

JEL No. 300

This paper investigates the hypothesis that surprise changes in the money supply and anticipated inflation (the Mundell-Tobin effect) are both inversely related to the expected real interest rate. The two novel aspects of the investigation are: (1) tests of the hypothesized impact of money surprises on real rates while simultaneously testing the Mundell-Tobin hypothesis; and (2) estimation employing transfer function methodology developed by Box and Jenkins (1970). The transfer function enables the investigator to entertain the hypothesis that residuals may not follow a simple AR-1 process, as is usually assumed in corrections for correlated residuals; rather, they may be represented appropriately by a more complex ARMA process. Based on quarterly data from 1959-I to 1980-IV, the results constitute a failure to reject either an inverse relationship between money surprises and expected real interest or an inverse relationship between anticipated inflation and expected real interest. These findings do not constitute a rejection of market efficiency, though.

## **The Efficiency Gains from Dynamic Tax Reform**

**Alan J. Auerbach, Laurence J. Kotlikoff,  
and Jonathan Skinner**

Working Paper No. 819

December 1981

JEL Nos. 323, 213

This paper presents a new simulation methodology for determining the pure efficiency gains from tax reform along the general-equilibrium, rational-expectations growth path of life-cycle economies.

The principal findings concern the effects of switching from a proportional income tax, with rates similar to those in the United States, to a proportional tax either on consumption or on labor income. A switch to consumption taxation generates a sustainable welfare gain of almost 2 percent of lifetime resources. In contrast, a transition to wage taxation generates a loss of greater than 2 percent of lifetime resources.

A second general result is that even a mild degree of progressivity in the income tax system imposes a very large efficiency cost.

## **The Changing Economic Value of Higher Education in Developed Economies**

**Richard B. Freeman**

Working Paper No. 820

December 1981

JEL No. 824

This paper analyzes the changing economic value of higher education in the major OECD countries. The first part of the study examines data on earnings by education or earnings in occupations composed of persons with different educational attainments. A second part looks at unemployment rates and the occupations attained by college graduates. Both the relative earnings data and the unemployment and occupational attainment data suggest that the heralded decline in the economic value of higher education in the United States is not a unique North American phenomenon, but rather a general development throughout the developed world. On the basis of evidence on elasticities of substitution and the observed growth in the supply of college graduates, the paper suggests that the decline in the premium to the educated reflects movement along a reasonably well-defined demand-for-graduates schedule due to the growth of the college and university systems of the various countries.

## **New Measures of Labor Cost: Implications for Demand Elasticities and Nominal Wage Growth**

**Daniel S. Hamermesh**

Working Paper No. 821

December 1981

JEL Nos. 824, 220

This study develops alternative quarterly measures of labor costs that refine the published data on hourly earnings and hourly compensation for 1953-78. These new series account for deviations of hours paid from hours worked, for the tax treatment of wages under the corporate income tax, and for variations in the user cost of training. These series generally produce somewhat higher elasticities of labor demand and explain variations in employment over time slightly better than do the published series. They also provide a different view of the recent path of wage inflation in the United States, suggesting that nominal wage growth has been more responsive to variations in the rate of price inflation than the published labor-cost series indicate. A data appendix lists the values of these new series; one series (that which adjusts for the distinction between hours paid and hours worked) can be updated with readily available data by persons interested in using these more appropriate measures of the cost of labor that faces employers.

## **Alternatives to the Current Maximum Tax on Earned Income**

**Lawrence B. Lindsey**  
Working Paper No. 822  
December 1981  
JEL No. 323

The maximum tax on personal service income was intended to reduce the maximum marginal tax rate on earned income to 50 percent. In general it did not achieve this result, although it did lower marginal tax rates on both earned and unearned income.

This paper considers the effect of different tax rate structures on the total tax revenue collected from high-income taxpayers. The sensitivity of tax avoidance practices to marginal tax rates is estimated using four different specifications. These estimates are then combined with plausible parameter values for income and substitution effects in the supply of labor to produce a range of elasticities of taxable income with respect to tax rates. Finally, the NBER TAXSIM model is used to estimate the effects of different rate structures on tax revenue.

## **The Lender of Last Resort and the Run on the Savings and Loans**

**Peter M. Garber**  
Working Paper No. 823  
December 1981  
JEL No. 311

Speculative runs on asset-price-fixing schemes are most often attributed either to an inexplicable mass hysteria or to a sudden, unpredictable random disturbance. Such attribution places runs and panics outside of the realm of scientific inquiry. Alternatively, in this paper I define the notion of a run as a discontinuous shift in portfolio asset holdings brought about by a belief in the end of the price-fixing regime. I also argue that runs are foreseeable events; the current difficulties of S and Ls serve as an extended example that emphasizes such predictability.

## **Inflation and the Valuation of Corporate Equities**

**Lawrence H. Summers**  
Working Paper No. 824  
December 1981

This paper examines the relationship between inflation and the return on individual corporate securities. This question is of substantial importance in light of the puzzling behavior of the stock market over the last decade. Conventional financial theory holds that equity should be a good hedge against inflation since it repre-

sents a claim of real rather than nominal assets. Yet a negative relationship between both expected and unexpected inflation and stock market returns has been widely documented. This relationship, which appears to antedate the surge in inflation over the last fifteen years, might provide an explanation for the market's surprising recent performance.

In an effort to explore the reasons for the aggregate negative relationship between inflation and stock market values, this paper studies differences across firms in the response of stock market values to changes in expected inflation. Two opposing hypotheses about the impact of inflation on market valuation are contrasted. The "inflation-illusion" hypothesis holds that investors are not able to see through nominal accounting statements and respond to reported rather than real profits. The opposing "tax-effects" hypothesis holds that firms that report spuriously high profits due to inflation are penalized because the extra tax burden incurred reduces real profits.

The results from the 1970s strongly bear out the predictions of the tax-effects hypothesis. Aggregate calculations suggest that the interaction of inflation and taxation can account for a large part of the decline in the stock market that has been observed over the past decade. A significant part of the remainder appears to be due to increasing investor awareness of the need to adjust for historic cost depreciation.

## **The Impacts on Capital Allocation of Some Aspects of the Economic Recovery Tax Act of 1981**

**Patric H. Hendershott and James D. Shilling**  
Working Paper No. 825  
December 1981  
JEL No. 323

This paper develops and employs a five-asset, four-household, single-business-sector simulation model to measure the long-run impacts of the major provisions of the Economic Recovery Tax Act of 1981 on the *allocation* of a *fixed* capital stock among owner-occupied housing, rental housing, and nonresidential capital. The specific provisions analyzed are the increases in tax depreciation for nonresidential capital and rental housing, and the reduction in the maximum tax rate on unearned income.

Our analysis suggests a 6 percent increase in nonresidential capital, an 11 percent decline in owner-occupied housing, and very little change in rental housing (the increase in the number of renters—the homeownership rate declines by 1.5 percentage points—offsets a decline in the quantity of rental services demanded per renter). In the absence of an increase in aggregate saving, real pretax interest rates rise by nearly 2 percentage points. Taxes on corporate profits decline by 60 percent, and aftertax earnings rise by 25 percent. As a result of the Act, the net (of depreciation) user costs for the three types of capital will almost be equalized.

## **Productivity and R and D at the Firm Level**

**Zvi Griliches and Jacques Malresse**

Working Paper No. 826

December 1981

This paper analyzes the relationship among output, employment, and physical and R and D capital, for a sample of 133 large U.S. firms covering 1966-77. In the cross-sectional dimension, there is a strong relationship between firm productivity and the level of its R and D investments. In the time dimension, using deviations from firm means as observations and unconstrained estimation, this relationship comes close to vanishing. This may be due, in part, to the increase in collinearity among trend, physical capital, and R and D capital in the within dimension, leaving little independent variability there. When the coefficients of the first two variables are constrained to reasonable values, the R and D coefficient is both sizable and significant. We also investigate the possibility of simultaneity between output and employment decisions in the short run. Allowing for this via the use of a system of semireduced form equations yields rather high estimates of the importance of R and D capital relative to physical capital. Our data do not allow us, however, to answer any detailed questions about the lag structure of the effects of R and D on productivity. These effects are apparently highly variable, both in timing and in magnitude.

## **Estimating Wage-Fringe Trade-Offs: Some Data Problems**

**Ronald Ehrenberg and Robert Smith**

Working Paper No. 827

December 1981

JEL No. 820

Our paper attempts to identify the types of data needed to estimate trade-offs between wages and fringe benefits (such as pensions); it also explores the usefulness for this estimation of one particular employer-based data set collected by Hay Associates. We stress three things: (1) employer-based data sets are required; (2) because pensions and many other fringe benefits are actuarial functions of wages or salaries, these technical relationships must be accounted for in estimation; and (3) to take account of the unobservable heterogeneity of employees across employers, one must use econometric methods that control for these unobservable variables. The paper concludes with a discussion of our attempts to estimate the trade-off between wages and fringe benefits using a unique data base, for 200 establishments, that contains information on wages and actuarial valuations of employer costs of fringe benefits at three different job levels.

## **Long-Run Effects of the Accelerated Cost Recovery System**

**Don Fullerton and Yolanda K. Henderson**

Working Paper No. 828

December 1981

JEL No. 323

Much of the debate surrounding the enactment of President Reagan's tax plan was concerned with the short-run effects of macroeconomic stimulation. Now that the Economic Recovery Tax Act of 1981 has become law, it is appropriate to look again at the long-run effect of these tax cuts. This paper measures, for 37 different assets and for 18 different industries, the reduction in effective corporate tax rates that results from the acceleration of depreciation allowances and the expansion of the investment tax credit. It also uses a detailed dynamic general equilibrium model of the U.S. economy to simulate the effects of the new Accelerated Cost Recovery System (ACRS) on revenues, investment, long-run growth, and capital allocation among industries. We find significant welfare gains from ACRS, but we find larger welfare gains from alternative plans that were not adopted.

## **Dividend Taxes, Corporate Investment, and Q**

**James M. Poterba and Lawrence H. Summers**

Working Paper No. 829

December 1981

Taxes on corporate distributions have traditionally been regarded as a "double tax" on corporate income. This view implies that while the total effective tax rate on corporate-source income affects real economic decisions, the distribution of the tax burden between the shareholders and the corporation is irrelevant. Recent research has suggested an alternative to the traditional view: perhaps firms in the United States pay dividends, in spite of the heavy tax liabilities associated with this form of distribution, because the stock market capitalizes the tax payments associated with corporate distributions. Capitalization leaves investors indifferent at the margin between corporations paying out dividends and retaining their earnings. This alternative view holds that while changes in the tax rate on dividends will affect shareholder wealth, they will have no impact on corporate investment decisions.

This paper develops econometric tests that distinguish between these two views of dividend taxation. Extending Tobin's  $q$  theory of investment to incorporate taxes at both the corporate and personal levels allows one to derive the implications of each view for corporate invest-

ment decisions. The competing views may be tested by comparing the performance estimates of investment equations under each theory's predictions. British time-series data are particularly appropriate for testing hypotheses about dividend taxes because of the substantial postwar variation in effective tax rates on corporate distributions in the United Kingdom. The econometric results suggest that dividend taxes have important effects on investment decisions.

## **Debt Management Policy, Interest Rates, and Economic Activity**

**Benjamin M. Friedman**  
Working Paper No. 830  
December 1981  
JEL No. 310

The maturity structure of the U.S. government's outstanding debt has undergone large changes over time,

at least in part because of shifts in the Treasury's debt management policy. During most of the post-World War II period, an emphasis on short-term issues rapidly reduced the debt's average maturity. In the early 1960s and again since 1975, however, the opposite policy just as rapidly lengthened (and is now lengthening) the average maturity. Such changes in debt management policy in general affect the structure of relative asset yields as well as nonfinancial economic activity.

The evidence presented in this paper indicates that debt management actions comparable in magnitude to the recent changes in U.S. policy on debt management have sizable effects both in the financial markets and more broadly. In particular, a shift from long-term to short-term government debt—that is, a shift opposite to the Treasury's recent policy—lowers yields on long-term assets, raises yields on short-term assets, and in the short run stimulates both output and spending. Moreover, the stimulus to spending is disproportionately concentrated in fixed investment, so that debt management that shortens the maturity of the government debt not only increases the economy's output but also shifts the composition of output toward increased capital formation.

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