

# NBER Reporter

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## Program Report

### Economic Fluctuations

Robert E. Hall

The ups and downs of the U.S. economy in the two years since the last report on NBER's Program in Economic Fluctuations have called attention to the importance of research in this area. Participants in the program have been seeking an understanding of the coexistence of recession and inflation, and trying to solve other major puzzles of the economy.

The economic fluctuations research program brings together thirty-seven economists from twelve universities. Over the past two years, the group has produced over sixty NBER Working Papers on topics related to macroeconomic fluctuations (see footnotes and references), as well as the dozen papers to be published in the NBER's forthcoming volume on inflation. In addition, many members of the fluctuations program are active in the related programs in Financial Markets and Monetary Economics, International Studies, Labor Studies, and Capital Formation.

In its most conspicuous public activity, a committee of program members is responsible for identifying cyclical peaks and troughs of the U.S. economy. In June 1980, the committee declared that a peak of activity had occurred in January 1980 and a year later declared July 1980 as the trough. With uncertain signs in the economy in late 1981, the committee will once again be turning its attention to the possibility that a peak may have occurred in 1981. The committee will follow its traditional practice of waiting until all data are available before making any announcement.

Not surprisingly, the problem of inflation has occupied a great deal of the program's attention. The Project on Inflation, financed by the National Science Foundation, involved eleven economists and one political scientist. In addition to supporting a large amount of scientific research, the Project commissioned twelve nontechnical papers on various aspects of inflation for presentation at

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This issue of the *Reporter* highlights the Bureau's Program in Economic Fluctuations. Next, Zvi Bodie discusses some of his work on investment, and Daniel Hamermesh describes his studies on social insurance programs. 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.

a pair of conferences on inflation held in Washington, D.C., in 1980 and 1981. These conferences attracted numerous policymakers, congressional staff members, journalists, and business and labor economists, and received prominent attention in the national financial press.

Robert J. Barro's paper for the inflation project, "U.S. Inflation and the Choice of Monetary Standard," finds that money growth and inflation are strongly positively correlated over long periods of time but are less closely associated from year to year. One source of short-run divergence between money and prices is a shift in the demand for money induced by a change in inflationary expectations, which reflects a shift in anticipations about future growth of underlying monetary aggregates. This channel, combined with the unpredictability of year-to-year changes in long-term rates, suggests that one-year-ahead inflation predictions in the present economic environment are subject to a large average error.

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Alan Blinder, in "The Anatomy of Double-Digit Inflation in the Seventies," argues that the two episodes of double-digit inflation in 1974 and 1979-80 have much in common: both were precipitated by food and energy shocks and were accompanied by substantial changes in relative prices. The dramatic acceleration of inflation between 1972 and 1974 can be traced mainly to three shocks—rising food prices, rising energy prices, and the end of the Nixon wage-price controls program—each of which required rapid adjustments of some relative prices. The equally dramatic deceleration of inflation between 1974 and 1976 can be traced to the simple fact that the three factors just named were not repeated. The state of demand had little to do with either the acceleration or the deceleration of inflation between 1972 and 1976, according to Blinder. This is not to say that aggregate demand management was irrelevant to inflation but only that its effects were minor compared to the supply shocks. The role of special factors in the burst of inflation in 1979-80 suggests that a similar analysis should be applied.

Stanley Fischer's paper, "Adapting to Inflation in the U.S. Economy," shows that the past decade has seen a variety of adjustments to high and variable inflation in the U.S. economy. The major adjustments are in the financial sector and particularly in mortgage financing. New mortgage instruments have been introduced, particularly in California: the Graduated Payment Mortgage, the Variable Rate Mortgage, and the Rollover Mortgage. Money market certificates and other new liabilities have substantially reduced the probability of future episodes of disintermediation. There has been increasing indexation of labor contracts, but COLA clauses cover only a small part of the labor force. The federal government has made few adjustments to inflation aside from indexation of Social Security benefits and some other transfer payments. In particular, inflation substantially affects the taxation of capital. Complete indexation would make the economy virtually impervious to inflations caused purely by expansion of the money supply and would make the inflation rate fall more rapidly in response to disinflationary policy, as well as rise more rapidly in response to inflationary policy. But an economy that is only partially indexed, as is the U.S. economy, may be more seriously affected by inflation than one that is not indexed at all. In a partially indexed economy, the burden of adjustment to inflation is spread more unevenly than in a nonindexed economy.

Douglas Hibbs, the sole noneconomist in the Inflation Project, contributed "Public Concern about Inflation

#### ERRATUM

The Program Report on Taxation in the Summer 1981 issue of the *NBER Reporter* included an error in the description of Lawrence Summers's work. On page 4, near the end of the first full paragraph, the sentence should read: "Simulations neoclassicals indicate that an increase in the rate of inflation from zero to 8 percent would cause an immediate 23 percent decline in the stock market, and ultimately a 35 percent decrease in the capital stock."

and Unemployment in the United States: Trends, Correlates, and Political Implications." According to Hibbs, not since the Great Depression of the 1930s and the immediate post-World War II reconversion scare has the state of the economy occupied such a salient place on the public agenda. In every year since the U.S. withdrawal from Vietnam more than 70 percent of the American public has identified an economic issue as "the most important problem facing the country today." Hibbs's research has studied evidence from surveys on the public's relative concern about inflation and unemployment over the 1970-80 period. Opinion data respond in a systematic way to macroeconomic developments: high and rising rates of inflation causing upward movements in the public's concern about inflation relative to unemployment and rising unemployment rates causing opposite movements in public concern. The opinion data indicate that when unemployment is stable, a solid majority of the public typically is more concerned about inflation than unemployment *if* inflation is running higher than 5 to 6 percent per annum.

Thomas Sargent's paper, "The Ends of Four Big Inflation," looks at the situation in four European nations—Austria, Hungary, Poland, and Germany—in the aftermath of World War I. Once-and-for-all fiscal reforms proved to be the key to successful control of inflation in all four cases. Sargent views these episodes as laboratories for studying changes in policy regimes. He concludes that there is no universal principle of macroeconomics that requires sharply diminished real activity to accompany rapid disinflation.

Martin Feldstein's paper, "Inflation, Capital Taxation, and Monetary Policy," examines the results of the interaction between inflation and existing tax rules. In the first part of the paper, Feldstein describes how inflation raises the effective tax rate on income from capital and thereby lowers the real net-of-tax rate of return. Between the mid-1960s and late 1970s, the total effective tax rate rose from less than 60 percent to more than 70 percent. The next part of the paper explains how tax rates and inflation interact to reduce the earnings of corporate equity by more than the net-of-tax yield on land, gold, housing, and other assets. With lower returns to investors and inflated costs of funds to firms, investment in business fixed capital is discouraged: the ratio of net fixed nonresidential investment to GNP fell by more than one third between the end of the 1960s and the decade of the 1970s.

John Shoven's "Inflation, Corporate Profits, and the Rate of Return to Capital," investigates the distorting effect of inflation on corporate operating statements. Inflation enlarges reported profits by depressing depreciation deductions below their proper economic level, but there is an equally important bias from inflation in the opposite direction. When prices are rising, corporations repay their debts in dollars of reduced value, and this reduction adds to their true economic profits. According to Shoven, corporate profits reported by the government for the years since 1973 have understated real current-cost income figures by a total of about \$160 billion.

Jacob Frenkel's paper, "U.S. Inflation and the Dollar,"

points out that the foreign exchange market is like the stock market, responding instantly to all types of new information, including changing expectations about U.S. policy and the policies of other major nations. Stabilization of the international value of the dollar would follow upon restoration of the stability of the purchasing power of the dollar at home. A floating exchange rate helps insulate the United States from misguided foreign monetary policies.

The gold standard has attracted attention recently as a solution to the vexing problem of inflation. In my paper for the conference, "Explorations in the Gold Standard and Related Policies for Stabilizing the Dollar" I point out the instability that might follow the adoption of the gold standard. Even at the peak of the world gold standard around the turn of the century, the United States suffered a decline in the purchasing power of the dollar of 40 percent over two decades. But the idea of a commodity standard for the dollar based on commodities other than gold may be a good one. I offer the suggestion of defining the dollar as a package of four commodities: ammonium nitrate, copper, aluminum, and plywood. This "resource unit" has been highly stable in the past three decades, so a dollar defined in its terms would have had stable purchasing power. Inflation could have been avoided through the adoption of a commodity standard for the dollar.

What has happened to the organization and efficiency of individual markets in the United States under the transition to rapid inflation over the past two decades? Dennis Carlton reported to the conference that inflation has pushed markets toward uniform products traded in highly organized markets and away from custom products. He showed that businesses relied heavily on unchanging prices for individual products in the bygone era of a stable dollar. In today's economy, all prices must be revised frequently. Customers must spend more effort in gathering information about prices. Carlton pointed to the explosion in the number and level of activity of organized commodity markets in the years since inflation became a serious problem. The number of contracts traded in the Chicago Mercantile Exchange rose by a factor of nearly 20 between 1955 and 1978, according to Carlton. He concludes that the "... disruption of transaction, consumption, and production patterns ... helps explain the hostility the public justly holds toward inflation."

Private pension plans are accumulating surpluses of tens of billions of dollars, thanks to inflation. This surprising conclusion was reported to the conference by Jeremy Bulow. According to Bulow, inflation raises the interest rates earned by pension funds but does not raise the pensions of most retired workers. As a result, "Workers have lost out to both firms and the Pension Benefit Guaranty Corporation." Most private pensions are set in dollar terms at the time of retirement and do not rise with inflation after that time, in contrast to Social Security benefits. Bulow finds it unlikely that private pensions will be indexed to inflation in the future, because of the enormous expense involved. Even indexing for 4 or 5 percent inflation, far below current rates, "... could easily double the value of a plan's vested benefits." To finance index-

ing of benefits, either current workers would have to accept a large reduction in wages or retirees would have to settle for much smaller initial pensions.

Robert J. Gordon investigated the consequences of ending inflation in terms of decreased output and increased unemployment. His evidence comes from a study of fourteen historical episodes in the United States, Germany, Switzerland, France, Japan, Italy, Brazil, and Israel. Not every episode shows adverse effects on employment when inflation ends. Gordon points out that there was a spectacular turnaround in inflation just after World War I in the United States, when inflation dropped from 20 percent to minus 26 percent in just a year and a half. The end of the inflation after World War II was also reasonably favorable, with inflation ending during a relatively mild recession. But more recent experience in the United States indicates that recessions have weak anti-inflationary effects, says Gordon. "The puzzling aspect of 1970-71 is the failure of the recession, which brought the level of real output from 4 percent above trend to 2.5 percent below trend, to have any effect at all in dampening inflation." Looking at other countries, Gordon finds that they, too, have only limited recent bursts of inflation by tolerating reduced output and employment. Germany has pursued a successful anti-inflation policy, says Gordon, but "the cost of this policy was relatively slow output growth of only 2.3 percent between 1973 and 1979, compared to 2.8 percent in the United States." Earlier, German growth had been well above U.S. growth. And in Switzerland, according to Gordon, literal price stability was achieved in the 1970s "by creating a veritable depression in real output." There are a few episodes where inflation has been brought under control without deep recession: France and Italy in the mid-1960s and Japan in the late 1970s.

In addition to these papers, which will appear in a National Bureau volume scheduled for publication in 1985, inflation, monetary policy, and related issues have been the subject of major scientific research papers by quite a number of program members.<sup>1</sup> Other central issues of the performance of the U.S. economy have not been neglected within the economic fluctuations program. The relation between taxes, spending, deficits, and economic activity has become a prominent national issue recently, but long-standing research programs undertaken by Robert Barro<sup>2</sup> and Martin Feldstein<sup>3</sup> and recent work by Andrew Abel<sup>4</sup> within the program have studied the issue in depth.

The determination of aggregate spending is a central issue in macroeconomics and has also received extensive treatment within the program in three areas. The most volatile element of spending, inventory investment, has been the subject of a major research effort by Alan Blinder<sup>5</sup> and also a study by Jerry Green and Jean-Jacques Laffont.<sup>6</sup> Investment in plant and equipment has been the subject of papers by Ben Bernanke<sup>7</sup> and Martin Feldstein.<sup>8</sup> Closely related research on consumption spending has been carried out by Sanford Grossman and Robert Shiller,<sup>9</sup> Robert Hall and Frederic Mishkin,<sup>10</sup> and Hall.<sup>11</sup>

Research on the disappointing record of productivity growth in the past decade is described in papers by Ben

Bernanke<sup>12</sup> and Robert Gordon.<sup>13</sup> Investigation of employment and unemployment and the analysis of the macroeconomic implications of employment arrangements has been carried out by Jerry Green,<sup>14</sup> by Herschel Grossman,<sup>15</sup> and by Robert Hall.<sup>16</sup> Frederic Mishkin has been engaged in a major research effort on the role of interest rates in the macroeconomy.<sup>17</sup> Victor Zarnowitz has continued his research on the economics of the business cycle.<sup>18</sup>

Finally, the International Seminar on Macroeconomics, organized by Robert Gordon and Georges de Menil, is an activity of the program, involving an annual meeting in Western Europe. Most of the papers are written by Europeans; the proceedings are usually published in the *European Economic Review*. The International Seminar has made important contributions to improving communication between macroeconomists on the two sides of the Atlantic.

<sup>1</sup>A. Blinder, "Monetary Accommodations of Supply Shocks under Rational Expectations," NBER Working Paper No. 464, March 1980; J. Boschen and H. Grossman, "Monetary Information and Macroeconomics Fluctuations," NBER Working Paper No. 498, July 1980, and "Tests of Equilibrium Macroeconomics Using Contemporaneous Monetary Data," NBER Working Paper No. 558, October 1980; R. C. Fair, "Estimated Effects of the October 1979 Change in Monetary Policy on the 1980 Economy," NBER Working Paper No. 538, August 1980; S. Fischer, "Indexing and Inflation," NBER Working Paper No. 670, May 1981; R. P. Flood and P. M. Garber, "Gold Monetization and Gold Discipline," NBER Working Paper No. 544, September 1980, "Process Consistency and Monetary Reform: Further Evidence and Implications," NBER Working Paper No. 635, February 1981, and "A Systematic Banking Collapse in a Perfect Foresight World," NBER Working Paper No. 691, June 1981; R. J. Gordon, "Monetary Policy and the 1979 Supply Shock," NBER Working Paper No. 418, December 1979, "A Consistent Characterization of a Near-Century of Price Behavior," NBER Working Paper No. 455, February 1980, (with Jon Frye) "Government Intervention in the Inflation Process: The Econometrics of 'Self-Inflicted Wounds,'" NBER Working Paper No. 550, September 1980, "The Variance and Acceleration of Inflation in the 1970s: Alternative Explanatory Models and Methods," NBER Working Paper No. 551, September 1980, "Output Fluctuations and Gradual Price Adjustment," NBER Working Paper No. 621, January 1981, and "Inflation, Flexible Exchange Rates, and the Natural Rate of Unemployment," NBER Working Paper No. 708, July 1981; Z. Hercowitz, "Money and the Dispersion of Relative Prices," NBER Working Paper No. 431, January 1980, "Money and Price Dispersion in the United States," NBER Working Paper No. 433, January 1980, and "Anticipated Inflation, the Frequency of Transactions, and the Slope of the Phillips Curve," NBER Working Paper No. 518, July 1980; B. T. McCallum, "Price Level Determinacy with an Interest Rate Policy Rule and Rational Expectations," NBER Working Paper No. 559, October 1980, "Monetarist Principles and the Money Stock Growth Rule," NBER Working Paper No. 630, February 1981, and "On Nonuniqueness in Rational Expectations Models: An Attempt at Perspective," NBER Working Paper No. 684, June 1981; F. S. Mishkin, "Does Anticipated Monetary Policy Matter? An Econometric Investigation," NBER Working Paper No. 506, June 1980; C. A. Sims, "Comparison of Interwar and Postwar Cycles: Monetarism Reconsidered," NBER Working Paper No. 430, January 1980, and "Martingale-Like Behavior of Prices," NBER Working Paper No. 480, June 1980.

<sup>2</sup>R. J. Barro, "Output Effects of Government Purchases," NBER Working Paper No. 432, January 1980; "Federal Deficit Policy and the Effects of Public Debt Shocks," NBER Working Paper No. 443, February 1980; and "On the Predictability of Tax-Rate Changes," NBER Working Paper No. 636, February 1981.

<sup>3</sup>M. Feldstein, "Tax Rules and the Mismanagement of Monetary Policy," NBER Working Paper No. 422, January 1980, "Government Deficits and Aggregate Demand," NBER Working Paper No. 435, January 1980; and "Inflation, Capital Taxation, and Monetary Policy," NBER Working Paper No. 680, May 1981.

<sup>4</sup>A. B. Abel, "Accelerated Depreciation and the Efficacy of Temporary Fiscal Policy: Implications for an Inflationary Economy," NBER Working Paper No. 596, December 1980.

<sup>5</sup>A. S. Blinder, "Inventories in the Keynesian Macromodel," NBER Working Paper No. 460, February 1980; "Inventories and the Structure of Macro Models," NBER Working Paper No. 515, July 1980; "Inventories and Sticky Prices: More on the Microfoundations of Macroeconomics," NBER Working Paper No. 620, January 1981.

<sup>6</sup>J. Green and J.-J. Laffont, "Disequilibrium Dynamics with Inventories and Anticipatory Price-Setting," NBER Working Paper No. 453, February 1980.

<sup>7</sup>B. S. Bernanke, "Irreversibility, Uncertainty, and Cyclical Investment," NBER Working Paper No. 502, July 1980.

<sup>8</sup>M. Feldstein, "Inflation, Tax Rules, and Investment: Some Econometric Evidence," NBER Working Paper No. 577, November 1980.

<sup>9</sup>S. J. Grossman and R. J. Shiller, "Consumption Correlation and Risk Measurement in Economies with Nontraded Assets and Heterogeneous Information," NBER Working Paper No. 690, June 1981.

<sup>10</sup>R. E. Hall and F. S. Mishkin, "The Sensitivity of Consumption to Transitory Income: Estimates from Panel Data on Households," NBER Working Paper No. 505, July 1980.

<sup>11</sup>R. E. Hall, "Intertemporal Substitution in Consumption," NBER Working Paper No. 720, July 1981.

<sup>12</sup>B. S. Bernanke, "The Sources of Labor Productivity Variation in U.S. Manufacturing, 1947-80," NBER Working Paper No. 712, July 1981.

<sup>13</sup>R. J. Gordon, "The 'End-of-Expansion' Phenomenon in Short-Run Productivity Behavior," NBER Working Paper No. 427, January 1980.

<sup>14</sup>J. Green, "Wage-Employment Contracts," NBER Working Paper No. 623, January 1981; with C. M. Kahn, "Wage-Employment Contracts: Global Results," NBER Working Paper No. 675, May 1981; and with Sepo Honkapohja, "Bilateral Contracts," NBER Working Paper No. 721, July 1981.

<sup>15</sup>H. I. Grossman, "Risk Shifting, Unemployment Insurance, and Lay-offs," NBER Working Paper No. 424, January 1980; and "Incomplete Information, Risk Shifting, and Employment Fluctuations," NBER Working Paper No. 534, August 1980.

<sup>16</sup>R. E. Hall, "The Importance of Lifetime Jobs in the U.S. Economy," NBER Working Paper No. 560, October 1980.

<sup>17</sup>F. S. Mishkin, "Are Market Forecasts Rational?" NBER Working Paper No. 507, July 1980; "Monetary Policy and Long-term Interest Rates: An Efficient Markets Approach," NBER Working Paper No. 517, July 1980; "The Real Interest Rate: An Empirical Investigation," NBER Working Paper No. 622, January 1981; and "Monetary Policy and Short-term Interest Rates: An Efficient Markets-Rational Expectations Approach," NBER Working Paper No. 693, June 1981.

<sup>18</sup>V. Zarnowitz, "Business Cycles and Growth: Some Reflections and Measures," NBER Working Paper No. 665, April 1981.

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## Research Summaries

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### Hedging Against Inflation

Zvi Bodie

My research focuses on the issue of hedging against inflation: that is, how households and institutional investors can take account of the unpredictability of inflation in making their investment decisions. A household is ultimately concerned not with the dollar value of its income and wealth but rather with its real value in terms of goods and services. In making its investment decisions, the household will therefore be concerned about the real rather than the nominal rate of return on its portfolio.

If the future rate of inflation were known with certainty, it would make no difference whether households were making their investment decisions on the basis of real or nominal rates of return, because the expected real rate of return on any asset would just be the nominal rate less the known inflation rate. Its real risk would be the same as its nominal risk. But when inflation is unpredictable, a guaranteed nominal rate of return may be a highly uncertain one in real terms. As inflation becomes more uncertain, conventional private pension plans and contractual savings schemes that offer a money-fixed stream of benefits, and conventional bonds and mortgages that offer a fixed nominal rate of return, become riskier and less attractive to investors.

What about institutional investors? The survival and success of institutional investors depend upon providing households with the kind of financial assets that they want to hold. As households become more and more interested in real rates of return, institutional investors must respond by offering new products and adjusting their investment policies accordingly. For example, if a life insurance company is offering a money-fixed savings plan to a household, then it can hedge simply by investing the funds it receives from households in long-term

bonds and other assets that offer a guaranteed nominal rate of return. However, as households begin to demand innovative products that offer some kind of purchasing power guarantee, life insurance companies and other institutional investors must change their hedging strategies to compensate for the changed nature of their liabilities. Ultimately, if households are concerned about real rates of return, then financial institutions will also be concerned.

In no area of financial planning is the concern about inflation, and hence the need for innovation, more acute than in providing for retirement income.<sup>1</sup>

In the context of the U.S. financial system, are purchasing power annuities (PPA)—that is, retirement annuities offering some kind of consumer price level indexation—feasible? After investigating the inadequacies of conventional and equity-based variable annuities in an inflationary environment, I assess the suitability of money market instruments hedged with commodity futures contracts as the asset base for PPAs and consider the possibility of having life insurance companies and private pension plans offer them to the public. The paper concludes that financial intermediaries could offer households a contractual retirement savings plan where both the nominal premiums paid in and the dollar value of the annuity benefits received were scheduled to increase at the rate of inflation expected to prevail over the duration of the plan. During the accumulation period, it would be relatively easy to adjust the premiums to the actual rate of inflation experienced. During the benefit phase, it would be especially desirable to have an annuity whose dollar value was adjusted at least approximately in accordance with the actual rate of inflation experienced.

Because there are no securities in the U.S. capital markets that offer a riskless real rate of return, PPAs might best be offered as variable annuities with most of the investment risk passed through to the policyholders. This risk could be minimized by using money market instruments hedged against unanticipated inflation with a small amount of commodity futures contracts as the asset base. The mean real rate of return on such a portfolio over the past twenty-six years has been about zero, suggesting that if stock insurance companies were to underwrite PPAs, the real earnings rate that they would use in pricing their policies would be at most zero. In response to the growing demand by labor unions to include a cost-of-living escalator in defined-benefit pension plans, employers could offer employees a PPA option that costs them the same as a conventional annuity.<sup>2</sup>

Having already focused on an investment policy designed to minimize risk, I address the issue of the risk-return trade-off facing an investor in the contemporary

U.S. capital markets in another of my papers.<sup>3</sup> The analytic framework that I use, and which underlies the investment strategies I present, is the Markowitz mean-variance analysis. The basic premise of the mean-variance framework is that the investor is risk-averse: given the choice between two investments that offer the same mean or average rate of return, the investor will always choose the less risky investment. Risk in the context of this analysis is identified with the unpredictability or uncertainty of achieving one's expected real rate of return and is measured by its variance or standard deviation.

The investor's decision-making process is usually divided into two stages. In the first stage, he computes what his risk-return opportunities are, and in the second he chooses the risk-return combination that suits him best. In the first stage, the investor starts by finding the minimum risk strategy and determining the mean real rate of return associated with it. He then proceeds to derive other portfolios that offer higher means with the least possible risk. The result of this part of the process is a trade-off curve showing the terms of trade between risk and expected return.

In this paper, I generate trade-off curves using data on rates of return from 1953 to 1979 for four major asset classes: common stocks, long-term bonds, short-term money-market instruments (bills), and commodity futures contracts. Bills are shown to be the cornerstone of any low-risk investment strategy. The minimum-risk portfolio has a mean real rate of return of around zero and a standard deviation of about 1 percent and consists almost entirely of bills. Stocks offer the highest mean rate of return but are also the most risky investment, with a standard deviation of approximately 20 percent. Bonds play a prominent part in portfolios that lie in the midsection of the trade-off curve, although not much would be lost if these instruments were eliminated, since they could be replaced by combinations of bills and stocks with little loss in portfolio efficiency. Commodities futures contracts are the only asset whose returns are positively correlated with inflation. As a result, by adding them to a portfolio that consists of stocks, bonds, and bills, it is possible to achieve any target mean rate of return with lower risk.

"Inflation Risk and Capital Market Equilibrium" expands this model into a theory of the effect of inflation uncertainty on the portfolio behavior of households and the equilibrium structure of capital market rates.<sup>4</sup> Using a continuous-time framework, in which households are assumed to maximize expected utility of lifetime consumption, I determine what their demands would be for various assets and then examine the equilibrium implications of those asset demands. With regard to portfolio behavior, I find that in the presence of inflation uncertainty, households will have an inflation-hedging demand for assets other than riskless nominal bills, which will be directly proportional to the covariance between

<sup>1</sup>Z. Bodie, "Purchasing Power Annuities: Financial Innovation for Stable Real Retirement Income in an Inflationary Environment," NBER Working Paper No. 442, February 1980, and *Journal of Portfolio Management*, Fall 1980.

<sup>2</sup>I am continuing my research in this area jointly with James Pesando as part of the NBER's Project on the Economics of the U.S. Pension System. We are investigating the terms under which sponsors of defined-benefit pension plans could offer innovative annuity designs to their retiring members. See Z. Bodie and J. Pesando, "Annuity Design in an Inflationary Climate," preliminary proposal, July 1981.

<sup>3</sup>Z. Bodie, "Investment Strategy in an Inflationary Environment," NBER Working Paper No. 701, June 1981, to be included in a forthcoming NBER Conference Volume.

<sup>4</sup>Z. Bodie, "Inflation Risk and Capital Market Equilibrium," NBER Working Paper No. 373, July 1979.

the rate of inflation and the nominal rates of return on these other assets. This inflation-hedging demand is precisely the amount of each asset that must be added to bills in order to create the portfolio with minimal variance of real return. In this framework, an asset is a perfect inflation hedge if and only if its nominal return is perfectly correlated with the rate of inflation.

There are three main findings regarding capital market rates in this paper. First, the equilibrium *real* yield spread between any risky security and bills is directly proportional to the difference between the covariance of the security's nominal rate of return with the market portfolio and its covariance with the rate of inflation. The *nominal* yield spread (or risk premium) can be expressed as the sum of two factors—the nominal yield spread on the market portfolio and the nominal yield spread on the optimal inflation-hedge portfolio, each multiplied by its partial beta coefficient. Second, as long as the net supply of monetary assets in the economy is *greater than* zero, an increase in inflation uncertainty will lower the risk premiums on all real assets. Third, a preliminary empirical test of the theory using rates of return on bills, common stocks, long-term bonds, real estate, and commodity futures contracts yields mixed results. The observed risk premiums on long-term bonds and futures have the "wrong" signs. The "cost" of hedging against inflation might therefore be negative in the sense that in moving from bills to the minimum-variance portfolio an investor might be able to achieve both a reduction in the variance and an increase in the mean of his real rate of return. I am continuing this research jointly with Alex Kane as part of the NBER's Project on the Changing Roles of Debt and Equity in Financing U.S. Capital Formation.

## Goals and Effects of Social Insurance

Daniel S. Hamermesh

Social insurance programs are among the largest and most pervasive of the many activities that federal and state governments undertake. Unemployment insurance (UI) payments in 1980 totaled over \$13 billion and were received by 3.1 million people in an average week. Old age insurance payments to retired persons under Social Security reached \$6.7 billion monthly in 1980, and there were 19.6 million recipients. The size and growth of these programs has spurred a renewed interest in them by economists, who had almost totally ignored them since the early 1940s. Current studies, many by NBER research associates, have demonstrated fairly conclusively some of these programs' effects that had hitherto been only the subject of speculation:

(1) We know that higher UI benefits induce recipients to spend more time out of work. Because employers pay only part of the costs of the benefits that their laid-off

workers receive, they too have a reduced incentive to avoid layoffs.<sup>1</sup>

(2) The federal retirement program under Social Security is unfunded; it appears to reduce private saving, as workers feel their old age will be provided for by Social Security, although the extent of this reduction in saving, and in the rate of capital formation, is still the subject of heated debate.<sup>2</sup>

(3) The structure of Social Security retirement benefits induces changes in older workers' decisions about working. The size of these effects is still the topic of much research, but at the very least, research has demonstrated that the 50 percent tax on earnings of Social Security recipients beyond a low amount has a substantial negative impact on their interest in working beyond that level of earnings.

### Justifications for Social Insurance

All of these demonstrated effects are important for evaluating how changes in social insurance programs may contribute to broader economic change. They do not, though, indicate how successful the programs are in meeting their original goals: the maintenance of consumption among unemployed or older Americans and the smoothing of aggregate spending. These goals underlay the Social Security Act of 1935: President Roosevelt's message to Congress as he conveyed the bill establishing the program stated that Social Security was designed, "to relieve the hazards of old age, unemployment. . . ." These goals still seem to be the basis of support for the programs today: members of the recent National Commission on Unemployment Compensation, although apparently fully aware of the research results discussed above, recommended broad liberalization of the program.<sup>3</sup> Apparently they were motivated by a desire to expand the income support of the unemployed.

While these goals clearly have a tremendous and lasting appeal, one might well ask why a government program is needed. Is not some unemployment expected, so that workers should save in good times to tide themselves over during bad times? If not, can't workers borrow against future earnings to prevent current hardship? Further, most people expect to grow old; a large body of economic thought, the theory of life-cycle saving, shows that people's consumption and saving are determined by their need to maintain a level of consumption during their retirement (that is, older years).

These considerations suggest that social insurance programs must be evaluated in terms of how well they succeed in smoothing consumption (over the business cycle in the case of UI; over the lifetime in the case of Social Security). Further, they must be justified as compensating for imperfections caused by personal decisions.

<sup>1</sup>A. Gustman, "Analyzing the Relation of Unemployment Insurance to Unemployment," NBER Working Paper No. 512, July 1980, summarizes recent evidence on these issues.

<sup>2</sup>For example, M. Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation: A Correction and Update," NBER Working Paper No. 579, November 1980.

<sup>3</sup>Cited in D. Hamermesh, "The Interaction between Research and Policy: The Case of Unemployment Insurance," NBER Working Paper No. 771, September 1981.

For example, UI is designed to make up for imperfect capital markets that prevent the unemployed worker who has not saved for a spell of unemployment from borrowing against future earnings.

## Unemployment Insurance

In a series of recent papers, I have investigated how well today's UI program meets its potential justification. If unemployed workers are able to borrow freely, or have sufficient savings, each extra dollar of UI benefits will be spent like each dollar of income received by employed persons: most of it will be spent, and the rest will be saved for retirement and unexpected events. If workers have not saved or cannot borrow, and their income loss from unemployment is sufficiently large, they will seek to maintain consumption by spending each dollar of benefits received. By comparing spending out of unemployment benefits with spending out of other income, one can infer how many recipients "need" the benefits, in the sense that they would suffer sharply reduced consumption otherwise. If all benefits are spent in the way that employed people spend their income, one infers that none of the benefits serves the basic goal of maintaining consumption that otherwise would have fallen drastically. Conversely, if each dollar of benefits increases recipients' spending by one dollar, then the program is 100 percent effective.

In my first experiment, I used information on older workers from the Retirement History Survey sponsored by the Social Security Administration.<sup>4</sup> Using data from 1971 and 1973 on the spending of over 2000 people between ages 60 and 67 on food, housing, transportation, and vacations, I found that roughly half of the benefits received were spent dollar-for-dollar; the other half were treated like ordinary income, with most spent but a small fraction saved. A similar analysis was performed on a more representative sample of over 14,300 people between 20 and 70 from the 1972-73 Consumer Expenditure Survey.<sup>5</sup> These data contain information on all spending by the households studied. Here, too, I found that half of the benefits were spent as if the recipients were unable to borrow and had not saved; the other half were spent just as the employed spend their incomes. These results were corroborated on data for the entire United States from the national income accounts for the years 1954-78. The marginal propensity to spend out of UI benefits exceeds that out of other income; the estimates suggest that slightly more than half of UI benefits are spent dollar-for-dollar. Taken together, the three sets of evidence suggest quite strongly that a large fraction of UI benefits do not help to achieve the program's goal of mitigating the hardship caused by unemployment. Because the payments are partly saved, the program is not entirely efficient in meeting its other goal—smoothing macroeconomic spending flows over the cycle—as it might otherwise be.

<sup>4</sup>D. Hamermesh, *Unemployment Insurance and the Older American*, W. E. Upjohn Institute, 1980.

<sup>5</sup>D. Hamermesh, "Social Insurance and Consumption: An Empirical Inquiry," *NBER Working Paper No. 600* (also forthcoming in *American Economic Review*, March 1982).

Half of UI benefits are spent entirely, though, implying that the program's goal is partly attained. Moreover, in the two sets of data on households, I found that recipients of UI benefits spend greater shares of their income on necessities than do the employed. They also tend to spend additional UI benefits on luxuries. What seems to happen is that the unemployed cut back on purchases of luxuries at first, then use whatever benefits they receive to restore these purchases.

## Social Security

Old age benefits are often justified on several grounds: (1) as a means of forced saving for persons who otherwise would spend each dollar of their income; (2) as a way of transferring today's bounty to persons who earned most of their income in less prosperous times; or (3) to maintain today's older people through a retirement that is unexpectedly longer than they had planned. Evaluation of this latter justification is the focus of some of my recent work done under the auspices of the NBER. This justification may be important: in the United States in the last ten years the life expectancy of white males age 45 increased by two years, the most rapid decennial increase in sixty years. (The increases among blacks are even larger; and similarly, especially rapid increases have occurred recently in Great Britain, France, and West Germany.) If people were unable to forecast these changes or react to them quickly, then we should not be surprised to observe very old people with a very low standard of living. That being the case, a transfer from today's workers to the elderly appeals to many.

Do people forecast their longevity well, and do their forecasts affect their behavior?<sup>6</sup> On the first issue, I surveyed over 400 economists using a mail questionnaire. The respondents appear to be well aware that the older you are, the higher your expected age at death is, but they do not seem to extrapolate improvements in longevity that occur over time. It is as if they looked at today's experience and projected it as constant. They update their forecasts but do not extrapolate. Moreover, they are overly pessimistic about living to age 60 and overly optimistic about living to age 80, given their perceived life expectancies. Despite these deviations from what actuarial data show, this sample of economists does fairly well in forecasting. A random sample of over 300 men forecasts its longevity in ways very similar to those of the economists surveyed.

Assuming the average person updates forecasts of his longevity as life expectancies increase, how much worse off will he be in old age than if he could foresee from early adulthood how the probabilities of survival would evolve over his lifetime? Or, what potential is there for Social Security to compensate for a shortfall in consumption in old age among people who forecast longevity as the economists in my sample do? Using a simulation model of the household's optimal lifetime consumption, I find that a person who forecasts longevity like the people in my samples would be no more than 8 percent worse off in old age than if he forecast perfectly. This suggests that

<sup>6</sup>D. Hamermesh, "Subjective Horizons, Increasing Longevity, and Economic Behavior," forthcoming as an *NBER Working Paper*.



unexpected increases in longevity provide little justification for Social Security that involves transfers of resources between generations.

My surveys also showed that the major determinants of differences in forecasts of longevity are differences in parents' and grandparents' longevity, although this was less so in the random sample than among the economists. (This large effect exists even though epidemiological evidence on the heritability of human longevity is sparse.) These implied differences can be combined with information on the longevity of people's parents in two sets of survey data to provide estimates of what these people's *subjective* life expectancy would be. If forecasts affect behavior, we should expect people with longer subjective horizons to retire later in life, since they must build up more assets to provide for a longer period of retirement. The first sample on which this is tested consists of 320 males ages 55-70 in 1973; the men are part of the Terman sample of highly intelligent people on whom data have been collected during their entire adult lives.<sup>7</sup> In this sample, people whose horizons are likely to be longer retire later; nearly half of additional longevity is devoted to extra time in the work force. In the Retirement History Survey, though, differences in subjective longevity that, I believe, are induced by differences in parents' longevity have no effect on the probability of retirement. Perhaps because people in the Terman sample are much more intelligent than average, the results are atypical of the entire population; or perhaps since the average person does not base his forecast of longevity on his parents' experiences, these latter may be poor proxies for subjective horizons in the Retirement History Survey. The issue of how retirement behavior is affected by changing life expectancies is clearly not yet resolved.

Additional evidence on the wealth of older persons is useful for evaluating how well Social Security meets its major goal of income maintenance. Laurence Kotlikoff and Lawrence Summers have shown that the wealth of most persons included in the Retirement History Survey is sufficient to enable them to maintain real consumption through the years they can expect to remain alive at a level equal to the average they maintained during their working lives.<sup>8</sup> My own evidence using the same data links their wealth to their current consumption. This comparison suggests that at least 43 percent of the households in the sample cannot maintain their current consumption if they survive as long as the average person in their age group can expect. The Kotlikoff-Summers study suggests that Social Security benefits are adequate for most people; my study suggests that they are not (perhaps because imperfect forecasting of longevity led to insufficient private saving for retirement). Which is correct? Should Social Security aim at providing only the average consumption that the person enjoyed during his working life, or should it enable him to live at the high-

er level, resulting from rising real earnings during his lifetime, that he enjoyed just before retirement?

There is no economic answer to this question; it depends on one's values. But the question and apparent contradiction in the evidence highlights the importance of considering the goals of the many social insurance programs that exist today. Research demonstrates that economists can examine the programs along the criteria under which they were originated and present evidence on how well they are meeting the goals attributed to them by their proponents. Economists can also analyze whether these goals are justified by the failure of markets and by imperfections in individuals' expectations.

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## Economic Outlook Survey

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### Third 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 continuation of sluggish business conditions but also a slow improvement on several fronts is indicated: there will be some reduction in the inflation and interest rates and a resumption of growth in total output at a gradually increasing pace.

This survey is the first one to feature an extended list of variables, including all major expenditure components of real GNP, two measures of inflation, and two series of interest rates, short-term and long-term. The changes in the format of the survey follow the preferences of a large and representative group of economists and business analysts as expressed in replies to a special mail questionnaire.

#### Less Inflation in the Year Ahead

The GNP implicit price deflator (IPD) is expected to rise 8.8 percent in 1981 and 8.0 percent in 1982. The projected increase over the four quarters through 1982:3 is 7.8 percent, while in the first three quarters of 1982 inflation would average 7.5 percent at annual rate. Three months ago, the survey predictions for the year ahead exceeded 8 percent. Thus a trend toward moderation is being increasingly anticipated.

The forecasts of the consumer price index (CPI) paint a similar picture. The CPI is seen as rising 10 percent in 1981 and 8 percent in 1982, a substantial improvement on the 13.5 percent increase in 1980. At annual rates, inflation in terms of CPI will run at the following annual percentage rates in the five quarters from 1981:3 through 1982:3: 9.2, 8.0, 8.0, 7.6, and 7.8.

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<sup>7</sup>D. Hamermesh, "A General Empirical Model of Life-Cycle Effects in Consumption and Retirement Decisions," forthcoming as an NBER Working Paper.

<sup>8</sup>L. Kotlikoff and L. Summers, "The Adequacy of Savings," NBER Working Paper No. 627, February 1981.

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

	Annual			Percent Change	
	1980	1981	1982	1980	1981
	Actual	Forecast	Forecast	to 1981	to 1982
1. Gross National Product (\$ billions)	2626.1	2919.0	3238.0	11.1	10.9
2. GNP Implicit Price Deflator (1972 = 100)	177.4	193.0	208.4	8.8	8.0
3. GNP in Constant Dollars (billions of 1972 dollars)	1480.7	1512.0	1554.0	2.1	2.8
4. Unemployment Rate (percent)	7.1	7.4	7.3	0.3 <sup>1</sup>	-0.1 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	163.2	154.8	170.0	-5.1	9.8
6. Nonresidential Fixed Investment (billions of 1972 dollars)	158.4	160.4	165.5	1.3	3.2
7. New Private Housing Units Started (annual rate million)	1.3	1.2	1.5	-7.7	25.0
8. Change in Business Inventories (billions of 1972 dollars)	-2.9	4.0	7.0	6.9 <sup>2</sup>	3.0 <sup>2</sup>
9. Treasury Bill Rate (3-month, percent)	11.6	14.7	13.0	3.1 <sup>1</sup>	-1.7 <sup>1</sup>
10. Consumer Price Index (annual rate)	13.5	10.0	8.0	-3.5 <sup>1</sup>	-2.0 <sup>1</sup>

	Quarterly						Percent Change	
	1981	1981		1982		Percent Change		
	1981 Q2 Actual	Q3	Q4	Q1	Q2	Q3	Q2 81 to Q2 82	Q3 81 to Q3 82
1. Gross National Product (\$ billions)	2881.6	2934.5	3009.0	3090.5	3183.0	3285.0	10.5	11.9
2. GNP Implicit Price Deflator (1972 = 100)	191.2	194.8	198.9	202.4	206.0	210.0	7.7	7.8
3. GNP in Constant Dollars (billions of 1972 dollars)	1507.4	1507.0	1516.0	1529.0	1543.0	1560.0	2.4	3.5
4. Unemployment Rate (percent)	7.4	7.2	7.5	7.6	7.4	7.2	0.0 <sup>1</sup>	0.0 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	129.9	148.0	155.0	160.0	165.0	175.0	27.0	18.2
6. Nonresidential Fixed Investment (billions of 1972 dollars)	160.4	159.5	160.0	162.0	164.0	166.0	2.2	4.1
7. New Private Housing Units Started (annual rate million)	1.2	1.1	1.2	1.3	1.5	1.6	25.0	45.5
8. Change in Business Inventories (billions of 1972 dollars)	9.7	3.5	4.0	6.0	6.0	6.7	-3.7 <sup>2</sup>	3.2 <sup>2</sup>
9. Treasury Bill Rate (3-month, percent)	14.8	15.1	14.5	13.8	13.3	12.7	-1.5 <sup>1</sup>	-2.4 <sup>1</sup>
10. Consumer Price Index (annual rate)	9.2	9.2	8.0	8.0	7.6	7.8	-1.6 <sup>1</sup>	-1.4 <sup>1</sup>

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

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

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

### Interest Rates Still High but Slowly Declining

The 3-month Treasury bill rate will peak at 15.1 percent in the current (1981:3) quarter, according to the median survey forecast. The predictions for the four following quarters, through 1982:3, are 14.5 percent, 13.8 percent, 13.3 percent, and 12.7 percent. The averages for the years 1981 and 1982 are 14.7 percent and 13.0 percent.

The yield on new high-grade corporate bonds will also peak in 1981:3, at 15.5 percent and will then decline gradually to 15.1 percent in 1981:4 and 14.1 percent in 1982:3. In sum, the ASA-NBER panelists foresee a sluggish but persistent decline in the interest rates, more or less in step with the moderation in inflation rates. The implicit real rates of interest are in the range of 5 to 8 percent, depending on the measures used, and show some irregular tendencies to decrease.

### Prospects of Recession and Recovery

Only a minute decline indistinguishable from zero growth is predicted for real GNP in 1981:3 by the average of the survey forecasts, but most of the respondents attach high probabilities to the event that output will go down (the median of these estimates is 62 percent, a very high figure by past standards). However, the forecasters generally expect growth to resume, although hesitantly, in 1981:4 and to increase significantly in 1982. The annual percentage rates of growth in constant-dollar GNP would be 2.4, 3.6, 3.6, and 4.5 in the four successive quarters from 1981:4 through 1982:3. Yet the year-to-year rise for 1981-82, projected at 2.8 percent, is still moderate (the increase predicted for 1980-81 is 2.1 percent).

Output of manufacturing, mining, and utilities will show more of a recovery, with gains rising from 2.8 per-

cent to 7.8 percent and averaging 5.2 percent in the four quarters through 1982:3. This advance in industrial production, however, will be insufficient to reduce unemployment, which will rise to 7.6 percent of the civilian labor force in 1982:1, then return to the level of 7.2 percent in 1982:3.

### **Consumption and Housing**

Personal consumption expenditures in 1972 dollars will register steady but moderate gains in the year ahead, totaling about 3.6 percent, and will reach the level of nearly \$1 trillion at annual rate in 1982:3. Residential fixed investment in 1972 dollars will total \$47.6 billion in 1981, slightly less still than in the depressed year 1980, and its recovery in 1982 to an average level of \$51.5 billion, although steady, would have to be characterized as disappointingly slow. Similarly, at an annual rate of 1.6 million units in 1982:3, housing starts would still be well below their levels before the 1980 recession, despite a 45 percent rise from the extremely low rate of 1.1 million units in 1981:3.

### **Corporate Profits, Business Investment, and Net Exports**

Aftertax profits of corporations will rise from \$148 billion annual rate in 1981:3 to \$175 billion in 1982:3, a gain of about 18 percent. Their year-to-year increase 1981-82 will be nearly 10 percent according to the median survey forecast, as compared with a 5 percent decline in 1980-81.

Nonresidential fixed investment in constant dollars will be weak throughout this year, although slightly (1.3 percent) higher than in the depressed 1980. It is seen as increasing 3.2 percent in the year 1982 as a whole and 4.1 percent between 1981:3 and 1982:3.

Business inventory investment will decline from an annual rate of 9.7 billions of 1972 dollars in 1981:2 to the \$4-5 billion range in the second half of 1981, then rise slightly to the \$6-7 billion range in 1982. But as usual the averages hide much variation in the individual forecasts for this highly volatile variable.

The decline in net exports of goods and services is expected to level off at annual rates slightly exceeding 40 billions of 1972 dollars. The average for 1980 was \$52 billion; the median forecasts for 1981 and 1982 are \$46 billion and \$40 billion, respectively.

### **Predictions of Government Purchases and Assumptions on Policies**

Federal government purchases of goods and services, adjusted for inflation, will increase 1.8 percent in 1981 and 2.1 percent in 1982. State and local government purchases will decrease 1/2 of 1 percent in 1981 and increase 6/10 of 1 percent in 1982. This implies that growth in these expenditures will be held down to rates considerably below the projected increases in total output.

In listing their assumptions, the forecasters take notice of the recently enacted laws reducing the tax rates. Most respondents anticipate a significant buildup of defense outlays (13 estimate it at 4-6 percent, 10 at 7-10 percent). Growth rates in monetary aggregates vary between 4 and 8 percent for M1B (13 specify the 4-5 percent range,

5 the 6-8 percent range) and more narrowly between 8 and 10 percent for M2. On energy demand and prices, there is a substantial consensus that they will be stable or declining. Views are divided on whether the dollar will strengthen or weaken.

*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.*

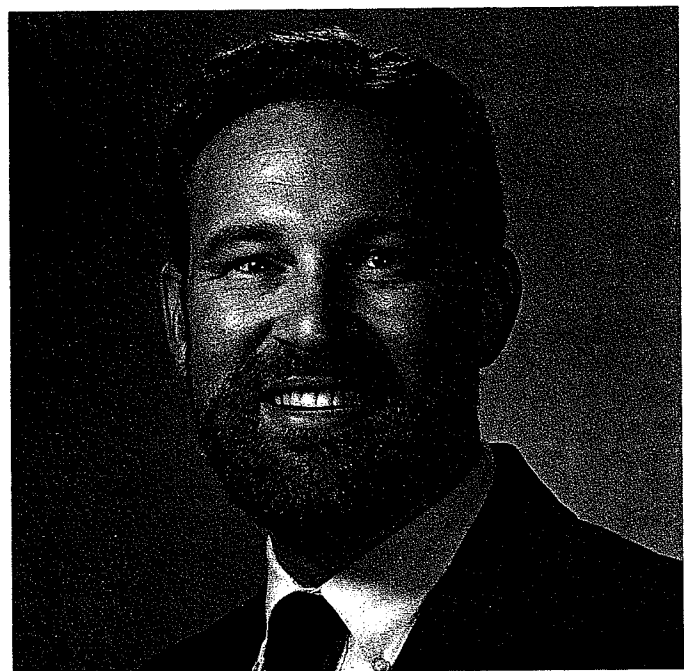
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## **NBER Profiles**

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### **Zvi Bodie**

Zvi Bodie, codirector of NBER's Project on the Economics of Public and Private Pensions, was named an NBER research associate in 1979. He is also associate professor of finance at Boston University's School of Management.



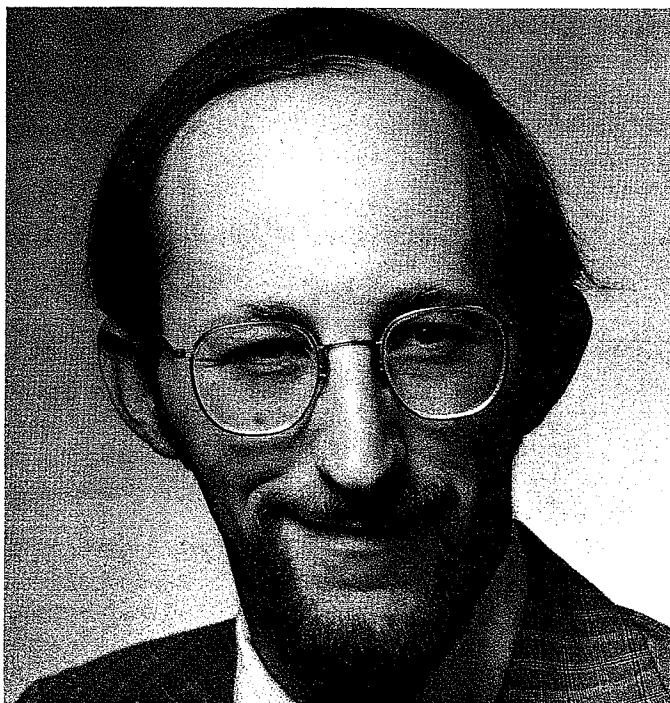
Bodie received his B.A. from Brooklyn College in 1965, his masters in economics from Hebrew University in 1970, and his Ph.D. in economics from MIT in 1975. From 1975-76 he was assistant professor of finance at MIT. In 1976, he joined the B.U. faculty as assistant professor of economics and finance. He was named associate professor in 1978 and also served as director of B.U.'s Health Care Financial Management Program from 1979-80.

Bodie's work on financial markets, and particularly inflation hedges, has been widely published. He has also served as a consultant to Morgan-Stanley Inc., Honeywell, and ITT Corporation.

Bodie and his wife, Judith, a clothing designer, live in Brookline, MA. They have two daughters.

## Daniel S. Hamermesh

Research Associate Daniel Hamermesh, professor of economics at Michigan State University, joined NBER's Program in Labor Studies in 1979. Hamermesh, who received his A.B. from the University of Chicago in 1965 and his Ph.D. from Yale University in 1969, was assistant professor of economics at Princeton University from 1969-73, associate professor of economics at MSU from 1973-76, and has been professor of economics there since 1976. In addition, Hamermesh was a visitor at the University of Essex (England) during the fall 1971 term, a visiting professor at Harvard University this past spring, and an academic visitor at the London School of Economics this summer.



Hamermesh was director of the U.S. Department of Labor's Office of Research from 1974-75 and served on the Technical Advisory Board of the National Commission on Unemployment Compensation from 1979-80. Hamermesh's widely published research focuses primarily on the areas of labor demand, and social insurance and labor market programs.

Hamermesh, his wife Frances, and their sons, David and Matthew, live in East Lansing, MI. In his leisure time, Hamermesh is an avid runner and cross-country skier.

## Charles A. Walworth

Charles A. Walworth, Treasurer of NBER's Board of Directors, joined the San Francisco office of Deloitte Haskins & Sells, international public accounting firm, in 1957. He became a partner in 1969 and transferred to the firm's executive office in New York City in 1974.



Walworth was born in Charleston, West Virginia, on December 30, 1931. He attended Cornell University, where he was elected to Phi Beta Kappa and Phi Kappa Phi, two national honor societies, and received a bachelor of arts degree in 1953. Walworth served in the Army from 1953 to 1955, attaining the rank of first lieutenant, then returned to his studies at Harvard School of Business Administration, where he received a masters degree in business administration in 1957.

Walworth is a member of the American Institute of Certified Public Accountants. He has served on the Institute's Practice Review Committee, its subcommittee concerned with techniques of statistical sampling, and its federal government task force on maritime matters. He has taught auditing at the University of San Francisco and at Pace University in New York City.

Walworth has served as chairman of Cornell University's alumni fund-raising campaign for northern California and on the Cornell University Council. He is also a member of the Harvard Club of New York City.

Mr. Walworth and his wife, Patricia, who have five children, live in Riverside, Connecticut.

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## Conferences

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### International Macroeconomics

The International Seminar on Macroeconomics (ISOM), a joint project of NBER and the Maison des Sciences de l'Homme in Paris, had its fourth annual meeting on June 18-19 in Paris. The conference brought together twenty-five economists from Belgium, France, Germany, Italy,

Japan, the United Kingdom, and the United States. Organizers of this continuing annual conference are Robert J. Gordon of NBER and Northwestern University, and Georges de Menil of the Maison des Sciences de l'Homme.

The 1981 conference covered a diverse group of topics in macroeconomics, with several papers providing a comparative cross-country analysis of a given topic. Papers with a comparative theme were:

Georges de Menil, Ecole des Hautes Etudes en Sciences Sociales, Paris, and Uwe Westphal, University of Hamburg, "The Transmission of International Disturbances: A French-German Cliometric Analysis, 1972-1980"

Discussants: Terry Burns, H.M. Treasury, London, and William H. Branson, NBER and Princeton University

Stanley Fischer, NBER and MIT, "Relative Price Variability and Inflation in the United States and Germany"

Discussants: Francesco Giavazzi, Universita di Venezia and University of Essex, and Jacob Frenkel, NBER and University of Chicago

William Nordhaus, NBER and Yale University, "Economic Policy in the Face of Declining Productivity Growth"

Discussants: Jacques Mairesse, NBER and Ecole des Hautes Etudes en Sciences Sociales, Paris, and Lawrence H. Summers, NBER and MIT

Although each of these three papers has in common a comparative methodology, their topics are quite different. The paper by de Menil and Westphal presents a comparative analysis of the response by the French and German economies to the common international demand and supply shocks of the 1970s. The authors conclude, first, that the German economy is more sensitive to international demand shocks than the French economy because of the greater preponderance of durables in German merchandise exports. Second, the greater degree of explicit and implicit indexation in the French economy makes it more vulnerable to international supply shocks. Finally, what the authors call "defensive pricing behavior," the rapid transmission of cyclical productivity movements into product prices, imparts a "stagflationary bias" to the French economy.

Fischer's paper examines the relation between the mean rate of inflation and the variability of relative prices in the United States and Germany. His main result is that there is a strong link between unanticipated inflation and relative price variability for both countries. This relation is consistent with either variable causing the other, since most of the statistical connection is simultaneous. Results from a small vector-autoregressive model are consistent with the view that the relation stems mainly from policy responses to relative price shocks, for example, autonomous changes in the price of oil. Fischer concludes that "the relationship between relative price variability and the inflation rate is not a structural characteristic of the economy, but rather a reflection of policy choices."

Nordhaus compares the experience of major OECD

nations and finds that each has suffered a slowdown in productivity growth that can be only partially explained by obvious causes, including slower growth in capital and a higher relative price of energy. He argues that the depletion of technological opportunities may explain much of the remainder of the cross-country slowdown. If so, then neoclassical optimal growth theory can be used to analyze the impact of the change on saving behavior. He shows that, depending on the parameters of the production function and of tastes, the fraction of national income devoted to investment may either rise or fall.

Two papers were more theoretical in orientation, each using theoretical tools to analyze important current policy issues:

Willem H. Buiter, NBER and University of Bristol, and Marcus H. Miller, University of Warwick, "Real Exchange Rate Overshooting and the Output Cost of Bringing Down Inflation"

Discussants: Uwe Westphal, and Robert Flood, Board of Governors of the Federal Reserve System

Francesco Giavazzi, Mehmet Odekon, INSEAD, France, and Charles Wyplosz, INSEAD, France, "Simulating an Oil Shock with Sticky Prices"

Discussants: John S. Flemming, Bank of England, and Paul Krugman, NBER and MIT.

The Buiter-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 show that the behavior of both the exchange rate and domestic prices in such a model depends on just how the "stickiness" in the behavior of domestic inflation is introduced into the model. The authors calculate the output cost involved in slowing the inflation rate and consider the effects of temporary incomes policy.

The Giavazzi-Odekon-Wyplosz paper builds a simulation model using the new "shooting" method developed by David Lipton, Jeffrey Sachs, and others at the NBER. The authors use the model to investigate the movements of the real exchange rate in response to an oil shock. This paper is related to that of Buiter-Miller, because the assumption that wages are "sticky" in the home country influences the path of output, the real interest rate, and the real exchange rate after the oil shock.

Two final papers presented at the conference included an investigation of the rationality of expectations of inflation in EEC countries and a brief report on an econometric test of the Green-Laffont equilibrium hypothesis (a sequel to a paper presented at the 1980 ISOM):

Francesco Papadia, Commission of the European Communities, Brussels, "The Controversy about Stabilization Policies and the Weak Form Rationality of Inflationary Expectations in the EEC Countries"

Discussants: Heinz Konig, Mannheim University, and Stanley Fischer

Gilbert Ducos, Universite des Sciences Sociales, Toulouse, Jerry Green, NBER and Harvard University, and Jean-Jacques Laffont, Universite des Sciences Sociales, Toulouse, and Ecole des Hautes Etudes

en Sciences Sociales, Paris, "A Test of the Equilibrium Hypothesis Based on Inventories"

The conference concluded with a round table discussion of differing policy responses of major industrial nations to the 1974 and 1979 oil shocks. The panel moderator was NBER President Martin Feldstein. Panel members, by country, were:

France—Gabriel Vengrevelinghe, Direction de la Prevision, Paris

Germany—Harmen Lehment, Kiel Institute of World Economics

Japan—Kumuharu Shigehara, OECD, Paris

U.K.—John Flemming

U.S.—Jeffrey Sachs, NBER and Harvard University.

## Taxation, Saving, and Investment

Approximately thirty-five economists from Europe and the United States met in Paris on June 22–24 for a conference on "Taxation, Saving, and Investment," organized by Eytan Sheshinski of the Hebrew University and Roger Guesnerie of CEPREMAP. The conference was sponsored by NBER, the International Seminar in Public Economics (ISPE), and Centre Nationale de la Recherche Scientifique (CNRS). NBER's participation represented a joint activity of the programs in taxation and capital formation. Eight of the sixteen papers delivered were presented by NBER research associates and dealt with different aspects of the taxation of capital and capital income:

David Bradford and Don Fullerton, Princeton University, "Pitfalls in the Construction and Use of Effective Tax Rates"

Discussant: Ephraim Sedka, Tel Aviv University

Mervyn King, University of Birmingham, "Welfare Analysis of Tax Reforms Using Household Data"

Discussant: Peter Englund, Stockholm School of Economics

Martin Feldstein and Louis Dicks-Mireaux, Harvard University, and James Poterba, Oxford University, "Effective Tax Rates and the Pretax Rate of Return"

Discussant: Anthony Atkinson, London School of Economics

Roger Gordon, Bell Labs, "Taxation of Corporate Capital Income: Tax Revenues versus Tax Distortions"

Discussant: Richard Kihlstrom, University of Pennsylvania

Alan Auerbach, Harvard University, "Stockholder Tax Rates and Firm Attributes"

Discussant: Seppo Honkapohja, University of Helsinki

Lawrence Summers, MIT, "Taxation and Corporate Investment: A  $q$  Theory Approach"

Discussant: Dominique Strauss-Kahn, Universite de Paris

Alan Auerbach, Laurence Kotlikoff, Yale University, and Jon Skinner, University of Virginia, "The Welfare Gains from Dynamic Tax Reform"

Discussant: Mats Persson, Stockholm School of Economics

Joseph Stiglitz, Princeton University, "Some Aspects of the Taxation of Capital Gains"

Discussant: Roger Gordon

Bradford and Fullerton illustrated that estimating the effective tax rate on a dollar of investment in a particular industry is a tricky matter. For example, estimates vary depending upon the interest rate used in the calculation. The results further depend on an assumed relationship between inflation and nominal interest rates. Their conclusion was that much sensitivity analysis and specificity are required in studies designed to estimate effective tax rates.

Using data from the Family Expenditure Survey of Great Britain, King discussed a methodology for calculating the distribution of gains and losses from a change in tax policy. He also simulated the effect of a specific reform involving the elimination of household subsidies.

The Feldstein/Poterba/Dicks-Mireaux paper presents new estimates of the taxes paid on nonfinancial corporate capital, the pretax rate of return to capital, and the effective tax rate. It shows that the pretax rate of return and the effective tax rate have varied substantially in the past 25 years. Pretax profitability was 1 to 1.5 percentage points lower in the 1970s than in the 1960s. Further, profitability in the 1960s was 0.5 percentage points greater than in the seven years of the 1950s after the Korean War. Between the mid-1960s and the late 1970s, the share of total pretax capital earnings taken in taxes rose from 55 to 69 percent. The authors examine a variety of reasons for variation in pretax profitability.

Gordon attempted to show that when inflation and uncertainty are taken into account, the taxation of corporate income leaves investment incentives basically unaffected; moreover, there could even be an efficiency gain. Gordon's explanation is that by taxing capital income, the government absorbs a certain fraction of both the expected return and the uncertainty in the return. Investors receive a lower expected return but they also bear less risk, and the two effects are offsetting.

Auerbach uses data on the behavior of stock prices and the characteristics of individual firms to identify the "tax rate clienteles" of different U.S. corporations. He then explores why the composition of these clienteles differs among firms. Based on the paper's theoretical model, Auerbach's empirical results suggest that clienteles are relatively stable and depend primarily on dividend policy although the firm's leverage may also play a role.

Summers investigates the effect of inflation on stock prices and investment in the context of Tobin's  $q$  theory of investment. He also asks what happens when there are changes in the taxation of capital income. One of his major findings is that an unanticipated increase in inflation from 0 to 8 percent leads to a 22.7 percent decline in stock prices.

Auerbach, Kotlikoff, and Skinner extend an earlier model they developed to incorporate an endogenous labor supply and retirement, and then examine the steady state and transitional effects of various changes in tax structure. To separate efficiency gains from steady state gains, they develop a methodology to calculate the maximum welfare increase that could be immediately sustained by any tax reform.

Stiglitz's paper examines certain critical aspects of the capital gains tax and its effect on investors' portfolio strategies, capital market equilibrium, aggregate consumption, and investment. It shows that the present structure of capital gains taxation may not only affect portfolio decisions but also distort the allocation of real resources. Finally, Stiglitz shows that a reduction in the tax rate of capital gains may raise government revenue in the short run, at the same time increasing consumption and reducing savings and investment. In the long run, government revenues could be reduced.

Other papers presented at the conference were:

Robert Willig, Princeton University, "Sector Differentiated Capital Taxation with Imperfect Competition and Inter-Industry Flows"

Discussant: Agnar Sandmo, Norwegian School of Economics and Business Administration

Peter Diamond, MIT, and James Mirrlees, Oxford University, "Social Insurance with Variable Retirement and Saving"

Discussant: Nicholas Stern, University of Warwick  
Pierre Pestieau, Universite de Liege, "Effects of Social Security on Personal Savings: The Case of Belgium"

Discussant: Andre Babeau, CREDOC

Patrick Artus, OECD, and Pierre-Alain Muet, CEPREMAP, "Fiscal Policy and Private Investment in France in the 1970s: An Econometric Study"

Discussant: Alain Bernard, Ministere de l'Economie (France).

Antoine Coutire, Ministere des Finances (France), and Yves Nizet, Ministere de l'Economie (France), "Fiscal Incentives for Investment: The French Experience of 1975"

Discussant: Denis Kessler, Universite de Paris

Dagobert Brito, Tulane University, "Optimal Taxation, the Distribution of Wealth, and the Ownership of Capital"

Discussant: Roger Guesnerie

Daniel Kovenock and Michael Rothschild, University of Wisconsin, "Capital Gains Taxation in an Economy with an Australian Sector"

Discussant: Eytan Sheshinski

Richard Kihlstrom and Jean-Jacques Laffont, Universite des Sciences Sociales de Toulouse, "Taxation and Risk Taking in Market Equilibrium Models with Free Entry"

Discussant: Oliver Hart, Cambridge University

Several of the papers presented in Paris will be published in a special conference issue of the *Journal of Public Economics*, to be edited by Martin Feldstein and Alan Auerbach of NBER.

## Private and Public Pensions

Members and guests of NBER's Project on Public and Private Pensions met on July 13 and 14 to discuss completed and ongoing research. The two-day program included the following sessions:

Laurence Kotlikoff, Yale University and NBER, Overview of the Structure of Private Pensions

James Pesando, Institute for Policy Analysis, University of Toronto, and NBER, "Employee Valuation of Pension Claims and the Impact of Indexing Initiatives"

Irwin Tepper, Harvard University and NBER, "Pension Fund Asset Allocation"

Alan Blinder, Princeton University and NBER, "Market Wages, Reservation Wages, and Retirement Decisions"

Joseph Pechman, Brookings Institution, Overview of the Brookings Retirement and Aging Project

Dallas Salisbury, Employee Benefit Research Institute (EBRI), Overview of EBRI Supported Research

Paul Taubman, University of Pennsylvania and NBER, "Pensions and Mortality"

Edward Lazear, University of Chicago and NBER, "Severance Pay, Pensions, Mobility, and the Efficiency of Work Incentives"

The three overviews, presented by Kotlikoff, Pechman, and Salisbury, brought participants up to date on the compilation of data and the research being undertaken at NBER, Brookings, and EBRI, respectively. Kotlikoff and Daniel Smith, NBER, are compiling a volume of pension statistics broader in scope than any previous publication in this area. Conference participants reviewed the book's proposed contents and suggested potential data sources that the authors might have overlooked.

Pesando's paper addressed the question of what rationale might exist for the indexation of private pensions. Blinder's study of retirement decisions of white males, ages 58-67, is based on the theory that the individual will retire when his reservation wage exceeds his market wage. He concludes that the normal effects of aging on market and reservation wages, and the provisions of certain private pension plans, are the major causes of the timing of retirement.

Taubman asked what effect mortality changes would have on the value of pension benefits, and what would happen if all employers were required to provide pensions for their employees. Finally, using a data set on 244 large U.S. pension plans covering about eight million workers, Lazear argued that firms use pensions as a form of severance pay, rewarding employees who retire early.

In addition to the speakers, NBER participants at the conference were: Fischer Black and Lawrence Summers, MIT; Zvi Bodie, Boston University; Jeremy Bulow and John Shoven, Stanford University; Martin Feldstein, David Hartman, and David Wise, Harvard University; and Robert Inman, University of Pennsylvania. Other participants were: Rosalind Altmann, University College of London; Jack Habib, Hebrew University; Richard Hemming and John Kay, Institute for Fiscal Studies (London); Stephen Kutner, SRI International; and Susan Wachter, University of Pennsylvania.

# International Tax Comparisons

Economists from the United States, England, West Germany, and Sweden met in Cambridge on August 17-19 as part of NBER's International Tax Comparisons Project. The purpose of this project is to evaluate the effective tax rate, and thus the aftertax rate of return, on capital investments in the United States, United Kingdom, Sweden, and West Germany. Project Director Mervyn King, University of Birmingham (England), and Taxation Program Director David Bradford of Princeton University opened the conference with a description of the methodology that has been and will be used to carry out this research. The comparative methodology is unique in that it looks at specific examples of investment in various types of equipment financed by either equity or debt held by different types of investors. These same cases are worked out using each country's tax system.

On the first day, NBER Research Associate Don Fullerton, Princeton University, presented some results for the United States. All three afternoons of the conference were devoted to informal discussions of ongoing work on this project.

On the second day, Jan Sodersten of the Industriens Utredningsinstitut (Stockholm) presented calculations based on the Swedish tax system. Alan Auerbach, of Harvard University and NBER, was the discussant for that session. Don Fullerton's work using the U.S. tax system, discussed by Roger Gordon of Bell Labs and NBER, followed.

The final day of the conference was devoted to the German results to date, presented by Willi Liebfriz of Munich's Institut fur Wirtschaftsforschung and discussed by David Bradford, and the United Kingdom's examples, presented by Mervyn King with John S. Flemming, Bank of England, as discussant.

The meeting was also attended by Bureau President Martin Feldstein; Julian Alworth, University of Munich; Tomas Lindberg, Stockholm; and James Poterba, Oxford University and NBER.

## General Equilibrium Models Discussed

General equilibrium models have long been used by economists to examine issues in taxation, trade policy, urban and regional location decisions, and other economic phenomena. These models inevitably had to be kept small to permit analytic solution. But in recent years, computer developments and computational algorithms have allowed researchers to find equilibriums in models with more sectors and consumers, more tax or other policy instruments, and more changes in policy.

NBER Research Associate John Shoven organized a conference for the NSF, held on August 24-28 in San Diego, to explore the application of computable general equilibrium models in a variety of areas. The following papers were presented:

Herbert Scarf, Yale University, "The Computation of Equilibrium Prices"

Discussant: Michael Todd, Cornell University

John Whalley and Ahsan Mansur, University of Western Ontario, "Numerical Specification of Applied General Equilibrium Models: Estimation, Calibration, and Data"

Discussant: Larry Lau, Stanford University

Dale Jorgenson, Harvard University, "Econometric Methods for Applied Equilibrium Modeling"

Discussant: James MacKinnon, Queen's University

Andrew Feltenstein, International Monetary Fund, "Money and Bonds in a Disaggregated Open Economy"

Discussant: Ronald McKinnon, Stanford University

Larry Kimbell and Glenn Harrison, University of California, Los Angeles, "General Equilibrium Analysis of Regional Fiscal Incidence"

Discussant: Charles E. McLure, Jr., NBER

Antonio Borges, INSEAD, France, and Larry Goulder, Stanford University, "Decomposing the Impact of Higher Energy Prices on Long-Term Growth"

Discussant: Alan Manne, Stanford University

Don Fullerton, Princeton University and NBER, and John Shoven, Stanford University and NBER, "A Comparison of Methodologies and Empirical General Equilibrium Models of Taxation"

Discussant: Peter Mieszkowski, Rice University and NBER

Jean Waelbroeck, Free University, Brussels, "International Trade Applications"

Discussant: Robert Stern, University of Michigan

Sherman Robinson, World Bank, and Laura D'Andrea Tyson, University of California, Berkeley, "Modeling Structural Adjustment: Micro and Macro Elements in a General Equilibrium Framework"

Discussant: Ronald McKinnon

Jaime Serra, El Colegio de Mexico, "A General Equilibrium Model on Mexico: Tax Incidence (VAT)"

Discussant: T. N. Srinivasan, Yale University

Peter Dixon, LaTrobe University, Australia, "Extending the ORANI Model of the Australian Economy: Adding Foreign Investment to a Miniature Version"

Discussant: John Whalley

Scarf discussed the algorithms that are used to compute models in general, the mathematical foundations for his own algorithm, and more recent techniques developed by Merrill, Eaves, and others. Many of the papers presented later in the conference included calculations performed using the techniques described by Scarf.

Mansur and Whalley followed with two contrasting approaches to the specification of general equilibrium models. The first approach involves econometrically estimating the parameters of the model. The second approach is to "calibrate" the model using a data set for a single year. For large systems, it is difficult to find the large quantities of data that are necessary for econometric estimation. Mansur and Whalley compared the results of a small model specified by each of the two methods.



They stressed the danger that a few key parameters can determine the results of an entire model.

Next Jorgenson discussed the econometric approach to modeling. He emphasized the advantage of the flexible "transcendental logarithmic" functions. Estimating production functions with technical change, he found that most industries are characterized by labor-using, capital-using, energy-using, and material-saving technical change. On the consumption side, Jorgenson then estimated utility functions for which the income elasticity of demand was different for different goods.

Feltenstein presented his general equilibrium model with money and bonds. This general model allows a nation's economy to be a price-taker for some goods and a price-setter for other goods. It also allows for government deficits, so that the supplies of money and bonds are endogenous variables, and it includes foreign consumers and foreign bonds. Feltenstein demonstrated that his model meets all the requirements for empirical implementation in the general equilibrium manner.

Kimbell and Harrison described the "Factor Price Revision Rule," which provides the analytic solution to a general equilibrium system when all elasticities of substitution in a model are the same. The authors also reported preliminary results from attempts to use this rule for more general models. In addition, Kimbell and Harrison discussed regional models, particularly focusing on models that consider California and the rest of the United States as separate regions and look at the effects of energy policies and property taxes.

Borges and Goulder use a large-scale, disaggregated model of the U.S. economy to assess the relative importance of three channels by which higher energy prices can affect economic growth. They find that the "direct effect" on overall productivity is most important. Somewhat less important is the "savings effect": if capital and energy are complements, then higher energy prices can lead to a reduction in capital accumulation (less saving). The third effect is the "terms of trade effect," which comes into play because some of the rents included in energy prices are paid to foreigners.

On the third day of the conference, Fullerton, Henderson, and Shoven reviewed the methodologies used by eight empirical general equilibrium models of taxation. They performed some experiments regarding the level of disaggregation in these models. They found that the welfare gains from policies such as integrating the corporate income tax with the personal income tax are measured to be larger in models with a higher level of disaggregation. The three authors also stressed the importance of such parameters as the labor supply elasticity and the elasticity of savings with respect to the net rate of return.

Waelbroeck, whose paper was coauthored by Victor Ginsburgh, compared the general equilibrium models used by most of the participants in the conference with linear programming planning models. He and Ginsburgh then presented changes to the planning models necessary to generate solutions that satisfy the canons of general equilibrium theory.

Robinson and Tyson's paper stresses the importance of macroeconomic considerations for general equilibri-

um models. They illustrate their points with references to models that they and others have built of semi-industrial countries (for example, Colombia, Turkey, and Yugoslavia). They discuss such macroeconomic concerns as the aggregate savings rate, methods for ensuring savings-investment equality, and determination of the price level. They then show how an economywide model can be divided into a macro and a micro submodel.

Serra and Kehoe calibrated a model of the Mexican economy using 1977 data and a special feature: the specification of a constraint on the real wage of urban labor, leading to unemployment. They also analyzed the 1980 fiscal reform in Mexico, which involved replacing a turnover tax system with a value added tax system. They find that, due to the fiscal reform, rural consumer groups benefit relative to urban groups, and that unemployment increases somewhat.

The final speaker of the conference, Peter Dixon, presented a paper coauthored by B. R. Parmenter and Russell J. Rimmer dealing with the ORANI model of the Australian economy. The basic version of ORANI contains many more production sectors, consumer goods, and factors of production than most of the models presented earlier in the conference. Much of the discussion focused on the linear approximation techniques that allow ORANI to be rearranged in a flexible manner and solved at low cost. Dixon and his coauthors also presented a model of foreign capital inflows and simulated the effects of changes in tariff policies.

In addition to the authors and discussants, the conference was attended by Charles Ballard, Curtis Eaves, and Hector Sierra of Stanford University, and Hadi Esfahani of the University of California at Berkeley.

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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 Winter issue of the *Reporter* is December 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss at (617) 868-3974.

**November 18-19, 1981**

Social Regulation, American Enterprise Institute

**November 20-21, 1981**

Exchange Rates and International Macroeconomics, NBER  
Conference on Public Policy, Carnegie-Mellon/Rochester

**December 3-4, 1981**

Conference on Wage Measurement, NBER (Income and Wealth)

**December 28-30, 1981**

Annual Meetings, American Economic Association  
North American Winter Meeting, The Econometric Society

**January 7-8, 1982**

Program Meeting: Pensions, NBER

**January 22-23, 1982**

Program Meeting: Financial Markets, NBER

**January 25-29, 1982**

Exchange Rates: Theory and Practice, NBER

**February 4-5, 1982**

Issues and the Conduct of Monetary Policy, American Enterprise Institute

**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)

**June 21-22, 1982**

International Seminar in Macroeconomics, NBER

**June 28, 1982**

Econometrics and Public Finance, NBER

**August 16-19, 1982**

Annual Meeting, American Statistical 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 19-20, 1982**

50th Anniversary of Berle and Means's book, *The Modern Corporation and Private Property*, Hoover Institution

**December 28-30, 1982**

Annual Conference, American Economic Association\*

**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\*

**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\*

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

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## Bureau News

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### Summer Institute

Over one hundred participants, representing fifty universities in the United States and abroad, met in Cambridge during July and August for the Bureau's third annual Summer Institute. Six NBER programs and projects held workshops and seminars: Economic Fluctuations, International Studies, Labor Studies, Private and Public Pensions, Productivity and Technical Change, and Taxation.

Members and guests of the Program in Economic Fluctuations, led by Program Director Robert Hall of Stanford University, focused on three topics: inventory behavior, the empirical application of rational expectations, and an evaluation of time-series data. The three groups were led by NBER Research Associates Alan Blinder, Princeton University; Frederic Mishkin, University of Chicago; and Robert Litterman, MIT, respectively.

The international studies group divided its sessions into two topics: comparative macroeconomics, and the changing patterns of world trade and factor movement. Each of the other groups discussed a broad range of ongoing and recently completed research, much of which is preliminary and will be formally presented at conferences this fall and winter.

The remaining four programs met both formally and informally to discuss work in progress. More than 100 papers were presented and discussed at the various working sessions of these groups. In addition, a number of researchers collaborated in the writing of joint research papers, many of which will appear as NBER Working Papers in the coming year.

## **Inflation and Business Fluctuations: A Call for Papers**

On April 30 and May 1, 1982, the National Bureau of Economic Research will hold a conference in Cambridge on Inflation and Business Fluctuations. The program, being organized by Professor Robert J. Barro of the University of Rochester and the NBER, will consist of seven papers with two formal discussants assigned to each paper.

A broad range of aspects of the macroeconomics of inflation and business fluctuations are appropriate paper topics for the conference: monetary policy, institutions and irregular phenomena such as banking panics; tax policy and government spending decisions; fiscal policy, expectations and incomplete information, real theories of cyclical fluctuations; cyclical variations in productivity, factors influencing the dynamics of business fluctuations, such as investment and inventory adjustment, nominal contracts and labor market rigidities; expected inflation and inflation uncertainty as causes of cyclical fluctuations. Other potential topics dealing with business fluctuations will also be considered. Priority will be given to empirically oriented research, but the submission of theoretical papers on these topics is also welcome.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, complete papers, with preference being given to papers by younger members of the profession. Any research that will not have been published at the time of the conference may be submitted. The deadline for submissions of abstracts and papers is January 15, 1982. Authors chosen to present papers will be notified by February 10. Finished papers must be ready for distribution to conference participants by April 1, 1982. The NBER will pay the expenses of those chosen to give papers at the conference. Abstracts and papers should be sent to Professor Robert J. Barro, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## **Reprints Available**

The following NBER Reprints, intended for nonprofit education and research purposes, are now available. (Previous issues of the *NBER Reporter* list titles 1-176 and contain abstracts of the Working Papers cited below.)

177. "A Note on the Efficient Design of Investment Incentives," by Alan J. Auerbach, 1981 (NBER Working Paper No. 483)
178. "Issues in Controllability and the Theory of Economic Policy," by Willem H. Buiter and Mark Gersovitz, 1981 (NBER Technical Working Paper No. 2)
179. "Estimated Effects of the October 1979 Change in Monetary Policy on the 1980 Economy," by Ray C. Fair, 1981 (NBER Working Paper No. 538)
180. "Government Intervention in the Inflation Process: The Econometrics of 'Self-Inflicted Wounds'," by Jon Frye and Robert J. Gordon, (NBER Working Paper No. 550)
181. "Monetarist Principles and the Money Stock Growth Rule," by Bennett T. McCallum, 1981 (NBER Working Paper No. 630)
182. "Capital Mobility and Devaluation in an Optimizing Model with Rational Expectations," by Maurice Obstfeld, 1981 (NBER Working Paper No. 557)
183. "The Determinants of the Variability of Stock Market Prices," by Sanford J. Grossman and Robert J. Shiller, 1981 (NBER Working Paper No. 564)
184. "Race Differences in Job Satisfaction: A Reappraisal," by Ann P. Bartel, 1981
185. "Demographic Differences in Cyclical Employment Variation," by Kim B. Clark and Lawrence H. Summers, 1981 (NBER Working Paper No. 514)
186. "Incomplete Information, Risk Shifting, and Employment Fluctuations," by Herschel I. Grossman, 1981 (NBER Working Paper No. 534)
187. "Risk Shifting, Unemployment Insurance, and Layoffs," by Herschel I. Grossman, 1981 (NBER Working Paper No. 424)
188. "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" by Robert J. Shiller, 1981 (NBER Working Paper No. 456)
189. "The Use of Volatility Measures in Assessing Market Efficiency," by Robert J. Shiller, 1981 (NBER Working Paper No. 565)
190. "Output Fluctuations and Gradual Price Adjustment," by Robert J. Gordon, 1981 (NBER Working Paper No. 621)
191. "The Consumer Price Index: Measuring Inflation and Causing It," by Robert J. Gordon, 1981
192. "Aggregate Land Rents and Aggregate Transport Costs," by Richard J. Arnott and Joseph E. Stiglitz, 1981 (NBER Working Paper No. 523)
193. "The Collapse of Purchasing Power Parities during the 1970s," by Jacob A. Frenkel, 1981 (NBER Working Paper No. 569)

194. "Monetary and Fiscal Policies in an Open Economy," by Jacob A. Frenkel and Michael L. Mussa, 1981 (NBER Working Paper No. 575)
195. "Inflation and Extraordinary Returns on Owner-Occupied Housing: Some Implications for Capital Allocation and Productivity Growth," by Patric H. Hendershott and Sheng Cheng Hu, 1981 (NBER Working Paper No. 383)
196. "Potential Competition May Reduce Welfare," Joseph E. Stiglitz, 1981
197. "Inflation, the Stock Market, and Owner-Occupied Housing," by Lawrence H. Summers, 1981 (NBER Working Paper No. 606)
198. "Stabilization, Accommodation, and Monetary Rules," by John B. Taylor, 1981
199. "On Estimating the Expected Return on the Market: An Exploratory Investigation," by Robert C. Merton, 1980 (NBER Working Paper No. 444)
200. "Optimal Inflation Policy," by Lawrence H. Summers, 1981 (NBER Working Paper No. 354)
201. "Taxation and Corporate Investment: A Q Theory Approach," by Lawrence H. Summers, 1981 (NBER Working Paper No. 604)
202. "Equality, Taxation, and Inheritance," by Joseph E. Stiglitz, 1978
203. "Capital Taxation and Accumulation in a Life-Cycle Growth Model," by Lawrence H. Summers, 1981 (NBER Working Paper No. 302)
204. "Labor Market Competition among Youths, White Women, and Others," by James H. Grant and Daniel S. Hamermesh, 1981 (NBER Working Paper No. 519)
205. "Corporate Tax Integration in the United States: A General Equilibrium Approach," by Don Fullerton, A. Thomas King, John B. Shoven, and John Whalley, 1981 (NBER Working Paper No. 337R)
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210. "The 1971-1974 Controls Program and the Price Level: An Econometric Postmortem," by Alan S. Blinder and William J. Newton, 1981 (NBER Working Paper No. 279)
211. "The 'Speculative Efficiency' Hypothesis," by John F. O. Bilson, 1981 (NBER Working Paper No. 474)

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### Arbitrage and Mean-Variance Analysis on Large Asset Markets

**Gary Chamberlain and Michael Rothschild**

Technical Working Paper No. 15

July 1981

JEL No. 521

We examine the implications of arbitrage in a market with many assets. The absence of arbitrage opportunities implies that the linear functionals that give the mean and cost of a portfolio are continuous; hence there exist unique portfolios that represent these functionals. The mean-variance efficient set is a cone generated by these portfolios.

Ross showed that if there is a factor structure, then the distance between the vector of mean returns and the space spanned by the factor loadings is bounded as the number of assets increases. We show that if the covariance matrix of asset returns has only  $K$  unbounded eigenvalues, then the corresponding  $K$  eigenvectors converge and play the role of factor loadings in Ross's result. Hence only a principal components analysis is needed to test the arbitrage pricing theory. Our eigenvalue conditional can hold even though conventional measures of the approximation error in a  $K$ -factor model are unbounded.

We also resolve the question of when a market with many assets permits so much diversification that risk-free investment opportunities are available.

### Welfare Analysis of Tax Reforms Using Household Data

**Mervyn A. King**

Technical Working Paper No. 16

July 1981

JEL Nos. 024, 320

This paper discusses a methodology for calculating the distribution of gains and losses from a policy change using data for a large sample of households. Estimates are based on the equivalent income function, which is money metric utility defined over observable variables.

This enables calculations to be standardized, and a computer program to compute the statistics presented in the paper is available for a general demand system. Equivalent income is related to measures of deadweight loss, and standard errors are computed for each of the welfare measures. An application to UK data for 5895 households is given that simulates a reform that involves eliminating housing subsidies.

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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 July 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.

### **Economic Well-being and Child Labor: The Interaction of Family and Industry**

**Claudia Goldin and Donald Parsons**

Working Paper No. 707

July 1981

JEL Nos. 850, 040

How did industrialization in the nineteenth century affect the well-being of American children from working class families? We use two revealing surveys from 1890 and 1907 to examine the implications of child labor on schooling decisions and on possible offsetting intrafamily transfers, in the form of current "retained" earnings or future asset transfers. We analyze both issues in the context of a formal model of family labor supply in which returns to schooling accrue after the youth has left the household; thus, the interests of the parents and the child need not coincide. Parents working in the industries examined did not, it appears, compensate their children for the reduced future earnings implied by child labor, in

either the current or in future time periods. But the migration of families in which parental altruism was weak may have eliminated much of the apparent increase in family income due to higher child earnings. We end with a note reconciling our findings with the long-term trend away from child labor.

### **Inflation, Flexible Exchange Rates, and the Natural Rate of Unemployment**

**Robert J. Gordon**

Working Paper No. 708

June 1981

JEL No. 134

This paper's most important conclusion is that, because the flexible exchange rate system has introduced an additional channel of monetary impact, over and above the traditional channel operating through labor market tightness, the growth rate of the money supply influences the U.S. inflation rate more strongly and promptly than shown in most previous studies. Lagged changes in the effective exchange rate of the dollar, through their influence on the prices of exports and import substitutes, help to explain why U.S. inflation was so low in 1976 and why it accelerated so rapidly in 1978. Granger causality tests indicate that lagged changes in the exchange rate influence inflation, but lagged inflation does not cause exchange rate changes. A policy of monetary restriction in the 1980s is shown to cut the inflation rate by 5 percentage points at about half the cost in lost output as compared with the consensus view from previous studies.

The paper defines the "no-shock natural rate of unemployment" as the unemployment rate consistent with a constant rate of inflation in a hypothetical state without supply shocks and with a constant exchange rate. A new estimate of this natural rate concept shows an increase from 5.1 percent in 1954 to 5.9 percent in 1980 due entirely to the much-discussed demographic shift in labor force shares and relative unemployment rates. Other higher estimates of the natural unemployment rate, close to 7 percent in 1980, result from the use of a naive Phillips curve that relates inflation only to labor market tightness and inertia variables.

The paper contains extensive sensitivity tests that: (1) examine the behavior of the basic inflation equation over alternative sample periods; (2) enter the growth rate of money directly, and track the behavior of a money-augmented equation in dynamic simulation experiments; (3) test and reject the view that wage-setting behavior is dominated by "wage-wage inertia," that is, the dependence of changes in wage mainly on their own past values.

## **Test Scores and Self-selection of Higher Education: College Attendance versus College Completion**

**Steven Venti and David A. Wise**

Working Paper No. 709

July 1981

JEL Nos. 850, 912

As a companion paper to our work on students' application and colleges' admission decisions, we have estimated a joint, discrete-continuous, utility maximization model of college attendance and college completion. The paper is motivated by the possibility that test scores are poor predictors of who will succeed in colleges; thus, they may not lead to optimal investment decisions and they may indeed unjustly limit the educational opportunities of some youth. We find that: (1) College attendance decisions are strongly commensurate with college completion. Persons who are unlikely to attend college would be very likely to drop out of even their "first-choice" colleges were they to attend. College human capital investment decisions are strongly mirrored by the likelihood that they will pay off. (2) Contrary to much of the recent criticism of the predictive validity of test scores, we find their informational content to be substantial. After controlling for high school class rank, for example, the probability of dropping out of the first-choice college varies greatly with SAT scores. (3) Individual self-selection, related to both measured and unmeasured attributes, is the dominant determinant of college attendance.

## **Test Scores, Educational Opportunities, and Individual Choice**

**Steven Venti and David A. Wise**

Working Paper No. 710

July 1981

JEL Nos. 850, 912

We estimate a model combining students' preferences for college with universities' admissions decisions to provide us with information on the role of test scores in determining post-secondary educational opportunities. In contrast to implications of much of the recent criticism of tests and their use, we find that Scholastic Aptitude Test (SAT) scores are more strongly related to student applications and choice of college "quality" than to college admissions decisions. In addition, although there is a substantial correlation between test scores and high school performance, we find that both post-secondary school preferences and ultimate opportunities are related as much to performance in high school as to test scores themselves. Although SAT scores certainly exclude some persons from schools, they do not represent a dominating constraint on the college opportunities of high school graduates, our findings indicate.

## **Discontinuous Distributions and Missing Persons: The Minimum Wage and Unemployed Youth**

**Robert H. Meyer and David A. Wise**

Working Paper No. 711

July 1981

JEL Nos. 212, 824

Using a new statistical approach, we estimate the effects of minimum wage legislation on the employment and wage rates of youth. We find that, without the minimum, not only would the percentage of out-of-school employed youth be 4 to 6 percent higher than it now is, but also that these youth would earn more. In particular, the expected hourly earnings of youth with market wage rates below the 1978 minimum are 10 percent lower with the minimum than they would be without it. Thus, an effect of the minimum is to increase the concentration of nonemployment among low-wage workers and to reduce their earnings relative to higher-wage workers. The minimum wage accounts for possibly a third of the difference between the employment rates of black and white youth, according to our results.

Our methodology is based on parameterization of the effect of the minimum on the distribution of "market" employment outcomes and market wage rates that would exist in the absence of the minimum. A concomitant of the estimation procedure is joint estimation of market wage and employment functions that would exist if there were no minimum.

## **The Sources of Labor Productivity Variation in U.S. Manufacturing, 1947-80**

**Ben Bernanke**

Working Paper No. 712

July 1981

JEL Nos. 131, 226

The traditional analysis of labor productivity does not directly address the question of the causes of productivity change because it concentrates on the comovements of jointly determined endogenous variables. This problem may be solved by a modeling approach in which productivity and other choice variables are assumed to respond optimally to five broad classes of exogenous (causal) shocks. Although these shocks are unobservable to the econometrician, their relative importance in the determination of productivity change may be obtained with maximum likelihood estimates.

## Effects of Inflation on the Pattern of International Trade

Alan C. Stockman

Working Paper No. 713

July 1981

JEL No. 431

This paper examines the relationship between inflation, exchange rates, and the pattern of international trade and payments in a small economy with utility-maximizing agents and a transactions demand for money. Fully anticipated inflation has real effects in the model through its role as a tax on money and thereby on monetary transactions.

An increase in the rate of monetary expansion generally reduces the value of domestic output and alters the composition of domestic production. The result is a change in the pattern of international comparative advantage and trade flows. The initial depreciation of the exchange rate that follows an increase in the rate of monetary expansion is accompanied by a trade surplus and capital outflow, while the subsequent depreciation is accompanied by a trade deficit.

## Risk Sharing through Breach of Contract Remedies

A. Mitchell Polinsky

Working Paper No. 714

July 1981

This paper examines risk sharing under three different remedies for breach of contract. The risk considered here arises from the possibility that after a seller and a buyer have entered into an agreement for the exchange of some (not generally available) good, a third party who values the good more than the original buyer may come along before delivery has occurred. The seller will thus want to breach the original contract. This risk is allocated optimally by the *expectation damage* remedy if the seller is risk neutral and the buyer is risk averse; by the *specific performance* remedy if the converse is true; and by a *liquidated damage* remedy if both parties are risk averse. The level of damages under the liquidated damage remedy is bounded by the expectation measure of damages and a "damage equivalent" to the specific performance remedy. A numerical example shows that use of the prevailing remedy for breach of contract—the expectation damage remedy—may plausibly cause a welfare loss of as much as 20 percent due to inappropriate risk sharing.

## Four Observations on Modern International Commercial Policy under Floating Exchange Rates

J. David Richardson

Working Paper No. 715

July 1981

JEL Nos. 422, 431, 441

This paper describes the essential similarity between "modern" commercial policy, with its rentlike revenues, and capital transfers. Consequently, import barriers are shown to have ambiguous effects on nominal and real exchange rates. The paper also examines some important supply-side welfare costs and consequences of import barriers through their influence on current asset prices and future capital formation.

The model in the paper is an aggregated, fixed-endowment, full-employment, general equilibrium model similar to those used in the pure theory of international trade, with financial capital and foreign exchange markets integrated in a manner consistent with the asset/portfolio-balance approach to exchange rates.

The model is empirically calibrated to reflect the United States and the rest of the world in the early 1980s. In this empirical stylization, U.S. import barriers are shown (1) to reduce national consumption possibilities more significantly than is usually thought to be the case; (2) to discourage U.S. physical capital formation; and (3) to have significant yet variable effects on exchange rates, where the variability depends on the distribution between the United States and the rest of the world of the rentlike revenues implicit in the import barriers. Notably, the more favorable this distribution to the United States, the larger is the dollar depreciation caused by import barriers.

## A Comment on Feldstein's Fisher-Schultz Lecture

Ray C. Fair

Working Paper No. 716

July 1981

Feldstein argues in his Fisher-Schultz lecture that he has found, by accounting for inflation and taxes, large and significant effects on the rate of return on investment. His results are interesting because they seem to be robust to alternative specifications of the investment equation. Feldstein has clearly not exhausted all possible specifications of the investment equation, and this comment reports on results, using Feldstein's data, for one alternative specification. The results do not support Feldstein's conclusion. The data do not appear to contain enough information to decide the issue of the quantitative effect of the cost of capital on investment.

## **The Effect of Unions on Productivity in the Public Sector: The Case of Libraries**

**Ronald G. Ehrenberg and Joshua L. Schwarz**

Working Paper No. 717

July 1981

JEL No. 825

This paper presents an analytical framework that can be used to analyze the effects of unions on productivity in the public sector. Our initial focus is on public libraries because considerable effort has been devoted to conceptualizing measures of library productivity and because of the availability of data to implement the framework. Preliminary estimates are presented based upon data from 71 municipal libraries in Massachusetts.

## **The Allocation of Capital between Residential and Nonresidential Uses: Taxes, Inflation, and Capital Market Constraints**

**Patric H. Hendershott and Sheng Cheng Hu**

Working Paper No. 718

July 1981

JEL Nos. 323, 932

We construct a simple, two-sector model of the demand for housing and corporate capital. An increase in the inflation rate, with and without an increase in the risk premium on equities, is simulated with a number of model variants. The model and simulation experiments illustrate both the tax bias in favor of housing (its initial average real user cost was 3 percentage points less than that for corporate capital) and the manner in which inflation magnifies it (the difference rises to 5 percentage points without an exogenous increase in real house prices and 4 percentage points with an exogenous increase). The existence of a capital market constraint offsets the increase in the bias against corporate capital, but it introduces a sharp, inefficient reallocation of housing from less wealthy constrained households to wealthy households that do not have gains on mortgages and are not financially constrained. Widespread usage of innovative housing finance instruments would overcome this reallocation but at the expense of corporate capital. Only a reduction in inflation or in the taxation of income from business capital will solve the problem of inefficient allocation of capital.

The simulation results also provide an explanation for the failure of nominal interest rates to rise by a multiple of an increase in the inflation rate in a world with taxes. When the inflation rate alone is increased, the ratio of the increases in the risk-free and inflation rates is 1.32. An increase in the risk premium on equities, in conjunction with the increase in inflation, lowers the simulated ratio to 1.10; introduction of a supply price elasticity of 4 and an exogenous increase in the real house price reduces the ratio to 1.03; and, incorporation of the credit market constraint reduces the ratio to 0.95.

## **The Efficiency of Decentralized Investment Management Systems**

**David S. Jones**

Working Paper No. 719

July 1981

JEL No. 311

The primary purpose of this paper is to demonstrate that decentralized investment management systems may not always be efficient. Specifically, within the context of a particular portfolio choice paradigm, it is shown that a given decentralized investment management system is (weakly) efficient if and only if the joint probability distribution of rates of return on assets satisfies certain covariance restrictions. If these restrictions do not obtain, then the asset portfolios generated by this decentralized structure will generally be inferior to those that would be generated by a completely centralized structure.

This paper also discusses how the managers of departments within an efficient decentralized structure should behave so as to generate portfolios that are optimal from the point of view of the institution as a whole. Generally, departmental managers should behave as if they have less risk aversion than the institution as a whole. In fact, the greater the value of a given manager's portfolio, the more risk averse he should be.

Finally, I note that the efficiency concept employed in this paper is equivalent to the proposition that certain assets admit consistent simple sum aggregation. This implies that the efficient decentralization of investment decisions permits the institution to economize on the information that must be passed to departments at higher levels.

## **Intertemporal Substitution in Consumption**

**Robert E. Hall**

Working Paper No. 720

July 1981

JEL No. 131

Does a higher real interest rate induce significant postponement of consumption? According to the theory developed here, this question can be answered by studying the relation between the rate of growth of consumption and expected real interest rates. In postwar data for the United States, expected real returns on stocks and savings accounts have declined over time. Over the same period, the rate of growth of consumption has been almost steady. The paper concludes that intertemporal substitution is weak, for if it were strong, the growth rate of consumption would have declined.



## **Bilateral Contracts**

**Jerry Green and Seppo Honkapohja**

Working Paper No. 721

July 1981

JEL No. 021

The basic form of economic exchange is a bilateral relationship between buyer and seller. If economic conditions are common knowledge, there is no problem in principle in determining the efficient quantity to trade. But if benefits are known only to the buyer and costs are known only to the seller, a situation of bargaining under incomplete information results. Instead of relying on the vagaries of a bargaining outcome, which might be quite costly to implement, economic inefficiency is likely to be improved by a contractual arrangement that could be agreed upon in advance. In such contracts various aspects of the exchange could be allocated to the two parties involved. For example, a price per unit might be fixed in advance and the buyer might be allowed to name his quantity in the light of the information he has about benefits. A more complex version would present the buyer with a nonlinear price schedule. Alternatively the supplier might be given control.

While these solutions are fairly well understood, there are other types of arrangements in which control is mutual. This paper studies contracts of this nature. We examine the feasibility of implementing various agreements and the nature of optimal bilateral contracts under these informational circumstances. When the random influences impact both parties significantly, full efficiency is not attainable. We show that contracts involving mutual control might sometimes be superior to the best contract giving one side or the other exclusive dominance.

## **The Relative Productivity Hypothesis of Industrialization: The American Case, 1820-1850**

**Claudia Goldin and Kenneth Sokoloff**

Working Paper No. 722

July 1981

JEL Nos. 040, 800

The American Northeast industrialized rapidly from about 1820 to 1850, while the South remained agricultural. Industrialization in the Northeast was substantially powered during these decades by female and child labor, which comprised about 45 percent of the manufacturing workforce in 1832. Wherever manufacturing spread in the Northeast, the wages of females and children relative to those of adult men increased greatly from levels in the agricultural sector that were previously quite low.

Our hypothesis of early industrialization is that such development proceeds first in areas whose agriculture, for various reasons, puts a low value on females and children relative to adult men. The lower the "relative productivity" of females and children in the preindustrial agricultural or traditional economy the earlier will manufacturing evolve, the proportionately greater will be the increase in relative wages for females and children, and the relatively more manufactured goods will the economy produce.

A two-sector model that incorporates a difference in "relative productivity" between two economies is used to develop seven propositions relating to the process of early industrialization. Data from two early censuses of manufactures, 1832 and 1850, and other sources provide evidence for our hypothesis, demonstrating, for example, the low relative productivity of females and children in the Northeast agricultural sector and the increase in relative wages for these laborers with industrialization. We conclude that factors with low relative productivity in agriculture were instrumental in the initial adoption of the factory system and of industrialization in general in the United States, and we believe these results are applicable to contemporary phenomena in developing countries.

## **Inflation, Real Interest, and the Determinacy of Equilibrium in an Optimizing Framework**

**Maurice Obstfeld**

Working Paper No. 723

July 1981

This paper examines the short-run relation between anticipated inflation and the real rate of interest in a model where agents with perfect foresight maximize utility over infinite lifetimes. In addition to deriving behavioral functions from explicit intertemporal optimization, the approach taken here departs from the usual IS-LM analysis in that it is dynamic and deals with a small economy open to trade in consumption goods. Because capital mobility must be ruled out to allow scope for variation in the real interest rate, the results obtained here for one of the two exchange-rate regimes considered—free floating—apply equally to a closed economy.

The paper shows that an increase in the expected inflation rate depresses the real interest rate in the short run when the exchange rate is instantaneously fixed by the central bank. When equilibrium is determinate in the floating-rate case, the real interest rate is invariant with respect to inflation.

## **Tax Aspects of Corporate Pension Funding Policy**

**Jeremy Bulow**

Working Paper No. 724

July 1981

JEL No. 521

This paper explores four models of firms' pension liabilities. All of the models yield the result that if it is the stockholders who gain or lose from a change in the market value of pension fund assets, a pension fund invested entirely in bonds will maximize that gain. If a firm's pension liabilities are considered to be no more than the present value of accrued benefits, then most plans for salaried employees would maximize the pension's value by having their assets entirely in bonds. However, for less well funded plans, such as most union plans, holding both stocks and bonds or even all stocks may maximize the value of the firm. Implicit contracts on the liability side of the pension balance sheet can encourage holding some stock, but implicit contracts on the asset side are likely to encourage increased bondholdings.

## **Savings and Loan Usage of the Authority to Invest in Corporate Debt**

**Patric H. Hendershott and Kevin E. Villani**

Working Paper No. 725

July 1981

JEL Nos. 313, 314

This paper examines the portfolio choice of savings and loan associations (SLAs) between mortgages and bonds, first in a world with certainty and then under uncertainty. Differences in service and transactions costs, default losses, tax treatment, and the timing of payments are accounted for in a certain world. SLAs are seen as investing in bonds only if the demand for mortgage funds is sufficiently weak that more profitable SLAs compete away some of the value of their tax preference by bidding down mortgage rates; in this case less profitable SLAs would find corporate debt attractive.

In an uncertain world, mortgages will command a premium over bonds to compensate for the prepayment option extended mortgage borrowers. The appropriate value of this premium depends on uncertainty about future interest rates and aversion to this uncertainty. SLAs that view future interest rates as more uncertain than the market does generally, or who are more averse to this uncertainty, will require an options premium greater than that determined in the market. Thus they will find corporate debt to be attractive relative to bonds, even when the demand for mortgage funds is strong and their mortgage tax preference is not competed away.

## **An Integrated View of Tests of Rationality, Market Efficiency, and the Short-run Neutrality of Monetary Policy**

**Andrew Abel and Frederic S. Mishkin**

Working Paper No. 726

August 1981

JEL Nos. 13I, 311, 313

This paper analyzes an important class of models in which expectations play a significant role. Included in the analysis are tests of: (1) rationality of forecasts in either market or survey data; (2) capital market efficiency; (3) the short-run neutrality of monetary policy; and (4) Granger causality in macroeconomic models. The common elements of these tests are also highlighted; in particular, cross-equation tests for neutrality or the short-run neutrality of money are shown to be equivalent to more common regression tests in the literature. Finally, the conditions for identification and the implications for whether hypotheses are testable are discussed.

## **On the Design of Contracts and Remedies for Breach**

**Steven Shavell**

Working Paper No. 727

August 1981

JEL No. 022

This paper considers the implications of uncertainty for the design of contracts and of remedies for their breach. Complete contingent contracts and then incomplete contracts are examined. Specifically, since making contingent provisions is difficult (due to the costs of enumeration and bargaining and the verification of occurrence of events), the particular cases in which contingency provisions are necessary are illustrated. The major part of the paper contains an analysis of two important implicit substitutes for contingent terms. The first is provided by remedies for breach of contract; when a party must pay damages for breach, he will be induced to fulfill his obligations in approximately those contingencies that would have been agreed upon under the terms of a detailed contract. The second substitute for contingent terms lies in the opportunity for renegotiation in light of circumstances, since renegotiation will occur in, more or less, those contingencies where the contract terms would have differed under a more detailed agreement.

## **Transition from Inflation to Price Stability**

**Peter M. Garber**

Working Paper No. 728

August 1981

This paper provides a detailed discussion of the real phenomena that materialized in the stabilization period following the German hyperinflation. Significant real dislocations arose after the monetary reform; these can be attributed to a government policy that subsidized heavy industry through the inflation tax proceeds. The "credibility problem" appears not to have been a significant factor in the postreform dislocation.

## **National Savings, Economic Welfare, and the Structure of Taxation**

**Alan J. Auerbach and Laurence J. Kotlikoff**

Working Paper No. 729

August 1981

JEL No. 323

This paper develops a perfect foresight, general equilibrium, simulation model of life-cycle savings that may be used to investigate the potential impact of a wide range of government policies on national savings and economic welfare. The model can provide quantitative answers to a number of long-standing questions concerning the government's influence on capital formation. These include the degree of crowding out of private investment by debt-financed increases in government expenditure, the differential effect on consumption of temporary versus more permanent tax cuts, the announcement effects of future changes in tax and expenditure policy, and the response to structural changes in the tax system, including both the choice of the tax base and the degree of progressivity.

The model tracks the values of all economic variables along the transition path from the initial steady state growth path to the new steady state growth path. Hence, it can be used to compute the exact welfare gains or losses for each age cohort associated with tax reform proposals.

## **An Examination of Empirical Tests of Social Security and Savings**

**Alan J. Auerbach and Laurence J. Kotlikoff**

Working Paper No. 730

August 1981

JEL No. 323

The effect of Social Security and other forms of government debt on national savings is one of the most widely debated policy questions in economics today. Some estimates suggest that Social Security has reduced U.S. savings by almost 40 percent. This paper examines recent cross-section and time-series empirical tests of the Social Security-savings question and argues that, given current data, neither type of test has much potential for

settling the controversy. In particular, there are a number of specification problems relating to Social Security time-series regressions that can easily lead to highly unstable coefficients and to rejection of the hypothesis that Social Security reduces savings, even if it is actually true.

These points are demonstrated by running regressions on hypothetical data generated by a perfect foresight, life-cycle, growth model we developed previously. While the data are obtained from a model in which Social Security reduces the nation's capital stock by almost 20 percent, time-series Social Security regression coefficients vary enormously depending on the specified level of the program, the preferences of hypothetical households, the level of concomitant government policies, and the time interval of the data.

## **Changes in the Provision of Correspondent Banking Services and the Role of Federal Reserve Banks under the DIDMC Act**

**Edward J. Kane**

Working Paper No. 731

August 1981

JEL No. 311

This paper focuses on microeconomic incentives set in motion by Federal Reserve decisions about how to implement the reserve requirement and pricing-of-service provisions of the Depository Institutions Deregulation and Monetary Control Act of 1980 (the DIDMC Act). These incentives promise to reshape the production and character of correspondent banking services, the margin of jurisdictional competition between state banking regulators and the Federal Reserve System, and ultimately the regional structure of the Federal Reserve itself.

## **Measurement Error and the Flow of Funds Accounts: Estimates of Household Asset Demand Equations**

**Carl E. Walsh**

Working Paper No. 732

August 1981

JEL Nos. 313, 211

In the household sector of the Flow of Funds Accounts, the difference between net acquisition of financial assets and net financial savings is equal to a statistical discrepancy that is often quite large relative to the reported changes in asset holdings. This means that the budget restrictions emphasized in the Brainard-Tobin approach to specifying asset demand equations are not satisfied by the data commonly used to estimate such equations. The view adopted in this paper is that the statistical discrepancy should be thought of as resulting from measurement error in the Flow of Funds data. By imposing a structure

on the measurement error, a consistent estimator is developed and used to estimate asset demand equations for the household sector. The demand equations are similar in specification to those used by others, so that the results allow a direct assessment of the effects of alternative treatments of the statistical discrepancy. The empirical results suggest that qualitative conclusions about the effects of financial flows and interest rates on asset demands are not affected by the way the statistical discrepancy is treated. Quantitative conclusions, however, are affected.

## **Taxation and On-the-job Training Decisions**

**Harvey S. Rosen**

Working Paper No. 733

August 1981

This paper presents an econometric analysis of the on-the-job training (OJT) decisions of a group of American white males during 1975. The data are obtained from the *Panel Study of Income Dynamics*, which asked a very careful series of questions concerning the individuals' OJT status. Each individual's internal rate of return is estimated and used as an explanatory variable to predict the probability of taking OJT. The individual's marginal tax rate is also entered into the equation. The results suggest that income taxation has tended to increase the probability of being involved in OJT. I conjecture that this is because income taxation makes investment in physical capital a less desirable vehicle for carrying consumption into the future and hence increases the attractiveness of human capital.

## **Social Security and the Decision to Retire**

**Anthony J. Pellechio**

Working Paper No. 734

August 1981

JEL No. 915

This study examines empirically whether Social Security influences the retirement decisions of individuals. The framework for this study is the life-cycle model of individual behavior that shows that there are two main ways in which Social Security can affect behavior: (1) through the change in an individual's lifetime income; and (2) through the changes in compensation paid for work. Social Security's income, substitution, and labor supply effects are also included in a model for examining retirement decisions. The data used in this study come from the Social Security Administration and are particularly well suited for this purpose. The models of retirement are estimated separately for samples of 62-64 and 65-70-year-old men. The empirical results support the conclusion that Social Security influences the decision to retire. The magnitude of behavioral responses to changes in Social Security benefits is reported, and implications for future behavior are discussed.

## **The Impact of Collective Bargaining: Illusion or Reality?**

**Richard B. Freeman and James L. Medoff**

Working Paper No. 735

August 1981

JEL No. 831

This paper reviews a significant body of evidence regarding the impact of trade unionism on economic performance and seeks to evaluate antithetical views as to whether estimated differences between union and non-union workers and firms represent: illusions created by poor experiments, real effects explicable solely in price-theoretic terms, or real effects that reflect the nonwage-related dimensions of trade unions. The review yields conclusions on both the substantive questions at hand and the methodologies that have been used to address their validity.

With respect to the illusion/reality debate, the preponderance of extant evidence indicates that union effects on a wide variety of economic variables estimated with cross-sectional data are real. Moreover, since the effects of unions on nonwage outcomes generally come from models that hold fixed the level of wages and variables affected by wages, the evidence supports the view that unions do much more than simply raise wages as an economic monopolist. While, in this study, we do not examine interpretations of these nonwage effects, the effects represent an empirical foundation for the "institutional" view of unionism, which is described in Section I.

With respect to methods for evaluating the quality of standard cross-sectional experiments, some techniques appear more useful than others. In particular, we find that sensitivity analyses of single-equation results and longitudinal experiments provide valuable checks on cross-sectional findings while multiple-equations approaches produce results that are much too unstable to help resolve the questions of concern.

## **Macroeconomic Adjustment and Foreign Trade of Centrally Planned Economies**

**John Burkett, Richard Portes, and David Winter**

Working Paper No. 736

August 1981

JEL Nos. 431, 052

This empirical study stresses the underlying macroeconomic forces that determine foreign trade flows in centrally planned economies (CPEs). The general specification includes a planners' demand equation for the volume of imports, a planners' supply equation for the volume of exports, and a rest-of-world demand equation for the export price level. The planners' behavioral equations include variables for activity levels, trade balance constraints, prices, and domestic excess demand. The import price is exogenous. This simultaneous equation model is estimated on annual data from the mid-1950s to

the mid-1970s, for Czechoslovakia, the GDR, Hungary, and Poland. Maximum likelihood estimation in a nested hypothesis testing framework allows selection of restricted versions of the general model for each country. Estimated price elasticities accord with the underlying theory, and the excess demand variables perform well.

### **Implications of Corporate Capital Structure Theory for Banking Institutions**

**Yair E. Orgler and Robert A. Taggart, Jr.**  
Working Paper No. 737  
August 1981  
JEL No. 312

This paper applies some recent advances in corporate capital structure theory to the determination of optimal capital in banking. The effects of corporate and personal taxes, government regulation, the technology of producing deposit services, and the costs of bankruptcy and agency problems are all discussed in the context of the U.S. commercial banking system. The analysis suggests explanations for why commercial banks tend to have relatively less capital than nonfinancial firms, why commercial bank leverage has tended to increase over time, and why large banks tend to have relatively less capital than small banks.

### **The Terminations Premium in Mortgage Coupon Rates: Evidence on the Integration of Mortgage and Bond Markets**

**Patric H. Hendershott and Kevin E. Villani**  
Working Paper No. 738  
August 1981  
JEL No. 313

During the last three years mortgage rates have risen relative to yields on comparable maturity bonds. The questions addressed in the present paper are: what is the extent of this increase, and to what is it attributable? We find the increase between early 1978 and early 1981 in coupon rates on GNMA mortgage pools relative to the rate on a comparable portfolio of Treasury bonds to be about 100 basis points. We attribute the increase to a rise in the terminations premium built into mortgage coupon rates. The premium is the price borrowers are charged for the option to repay the mortgage when it is to their benefit (to refinance if interest rates decline). This price has risen in response to an increase in interest rate uncertainty. Our empirical results suggest that the increase is due to both greater uncertainty regarding the inflation premium in interest rates and the lesser weight the monetary authorities give to interest rate stability in their deliberations.

### **Housing Finance in the United States in the Year 2001**

**Patric H. Hendershott and Kevin E. Villani**  
Working Paper No. 739  
August 1981  
JEL No. 313

In this paper, we first identify the essential services provided by a financial system and then derive the characteristics of the system that would exist in a technologically advanced society unfettered by nonneutral taxes and regulations. Next we consider how taxes and regulations have shaped the existing American financial structure. Finally, we posit likely tax and regulatory changes and conjecture as to how technological innovation will further interact with these changes to alter the American financial system. Our basic contentions are that the tax and regulatory influences are eroding and that the system will eventually move toward the unfettered financial system described in the first section.

### **The Effective Tax Rate and the Pretax Rate of Return**

**Martin Feldstein, James Poterba, and Louis Dicks-Mireaux**  
Working Paper No. 740  
September 1981  
JEL No. 320

This paper presents new estimates of the taxes paid on nonfinancial corporate capital, on the pretax rate of return to capital, and on the effective tax rate. The basic time series show that both the pretax rate of return and the effective tax rate have varied substantially in the past quarter century.

An explicit analysis indicates that, after adjusting for different aspects of the business cycle, pretax profitability was between 1.0 and 1.5 percentage points lower in the 1970s than in the 1960s. The rate of profitability in the 1960s was also about 0.5 percentage point greater than the profitability in the seven years of the 1950s after the Korean war.

Changes in productivity growth, in inflation, in relative unit labor costs, and in other variables are all associated with changes in profitability. None of these variables, however, can explain the differences in profitability between the 1950s, 1960s, and 1970s.

Looking at broad decade averages, the effective tax rate and the pretax rate of return move in opposite directions, higher pretax profits occurring when the tax rate is high. There thus appears to have been no tendency for pretax profits to vary in a way that offsets differences in effective tax rates.

## **The Social versus the Private Incentive to Bring Suit in a Costly Legal System**

**Steven Shavell**

Working Paper No. 741

September 1981

JEL No. 022

Given the costs of using the legal system, how do the incentives of private parties to bring suit relate to what would be socially appropriate? The answer presented in this paper involves two elements. First, as a potential plaintiff takes into account only his own legal expenses in deciding whether to bring suit, the private cost of suit is evidently less than the social cost (which would include the defendant's legal expenses as well), suggesting a tendency toward excessive litigation, other things being equal. Second, though, as the plaintiff takes into account his own expected gains but not the social gains attaching to suit (for example, the general effect of the suit on the behavior of potential defendants), and as these social gains could be either larger or smaller than his own gains, there is a tendency that could either counter or reinforce the original tendency to litigate.

## **Pigouvian Taxation with Administrative Costs**

**A. Mitchell Polinsky and Steven Shavell**

Working Paper No. 742

September 1981

JEL No. 022

This paper examines how the optimal Pigouvian tax should be adjusted to reflect administrative costs. Several cases are examined: where the administrative costs are fixed per firm taxed or are a function of the amount of tax collected, and where such costs are borne by the government or by the taxed firm. In some cases, the presence of administrative costs increases the optimal tax above the external cost, while in other cases it leads to a decrease in the tax.

## **On the Role of Social Security as a Means for Efficient Risk-Bearing in an Economy Where Human Capital Is Not Tradeable**

**Robert C. Merton**

Working Paper No. 743

September 1981

JEL No. 915

An intertemporal general equilibrium model of an economy with overlapping generations and two factors of production—labor and capital—is used to analyze the economic inefficiencies caused by the inability to trade human capital and to derive a constrained Pareto-optimal system of taxes and transfers that correct these inefficiencies. It is shown that, in the absence of such a system, this failure of the market causes the equilibrium path of the economy to deviate from the optimum for two rea-

sons. First, as is well known, people cannot achieve their optimal life-cycle consumption program because early in life, when most of their wealth is in the form of human capital, they cannot consume as much as they would otherwise choose. Second, investors cannot achieve an optimal portfolio allocation of their savings. Not only will some investors be forced to bear more risk than they would choose in the absence of this market failure, but also because factor shares are uncertain, the portfolios held by investors will be inefficient. The young are forced to invest too much of their savings in human capital and the old are forced to invest too little in human capital. Hence, all investors bear "factor-share" risk which, if human capital were tradeable, could be diversified away. It is shown that an optimal system of taxes and transfers, not unlike the current Social Security system, can eliminate this inefficiency. Therefore, it is suggested that a latent function of the present system may be to improve the efficiency of risk bearing in the economy.

## **Price Inertia and Policy Ineffectiveness in the United States, 1890-1980**

**Robert J. Gordon**

Working Paper No. 744

September 1981

JEL Nos. 130, 042

This paper introduces a new approach to the empirical testing of the Lucas-Sargent-Wallace (LSW) "policy ineffectiveness proposition." Instead of testing that hypothesis in isolation from any plausible alternative, the paper develops a single empirical equation explaining price change that includes as special cases both the LSW proposition and an alternative hypothesis. The alternative, dubbed "NRH-GAP," states that prices respond fully in the long run, but only gradually in the short run, to nominal disturbances in aggregate demand. A second innovation is the development of a quarterly data file for the period 1890-1980, thus opening up more than 200 new quarterly observations for analysis. A third innovation is the testing of three different methods of introducing "persistence effects" into the LSW analytical framework.

In conflict with the predictions of the LSW approach, the results here exhibit uniformly high coefficients of real output and low coefficients of price changes in response to anticipated changes in nominal GNP. Further, price changes respond positively and output responds negatively to lagged changes in prices, reflecting the short-run inertia in price setting that forms the basis for the alternative NRH-GAP approach. Evidence is also provided that velocity tends to respond negatively to anticipated changes in money in contrast to the usual assumption in this literature of random, serially independent changes in velocity. Two shifts in the structure of the price-setting process are noted—a much higher degree of price responsiveness during World War I and its aftermath, and a longer mean lag in the influence of past price changes after 1953.

Of independent interest, beyond its treatment of the policy ineffectiveness debate, is the treatment in the paper of changes in monetary regimes, and of the impact of programs of government intervention. The money creation process exhibits a highly significant change in structure before and after World War I and a marginally significant change in 1967. The results identify five episodes of government intervention that significantly displaced the time path of prices—the National Recovery Act of 1933–35, and price controls during the two world wars, Korea, and the Nixon era.

### **Financing Capital Formation in the 1980s: Issues for Public Policy**

**Benjamin M. Friedman**  
Working Paper No. 745  
September 1981

Three specific aspects of the corporate financing decision—internal versus external funds, equity versus debt within the external component, and features of the debt, especially including maturity—present opportunities (and pitfalls) for public policy to affect U.S. capital formation.

First, by reducing the government's dissaving and hence its claims on the economy's financial resources, policy can make credit market funds available for corporations to finance their investment externally, thereby both stimulating the overall amount of capital formation and taking advantage of the allocative efficiency of the competitive market mechanism to achieve a productive composition of that capital formation. At the same time, by using the tax system to augment the rate of return on corporate-sector assets, policy can better enable corporations to compete for such funds once they are available.

Second, by eliminating or even reversing the current tax discrimination in favor of debt, policy can encourage corporations to rely at least in part on equities in their external financing, thereby reducing the economy's aggregate-level financial risk.

Third, by neutralizing or even reversing the current emphasis on long-term securities in managing the federal government's own debt, policy can encourage corporations to issue long- instead of short-term debt instruments, thereby further reducing aggregate-level financial risk. Along the same lines, policy can play a role in pioneering markets for new financial instruments, such as bonds that provide protection of the investor's purchasing power, which private borrowers can then use to finance private capital formation.

### **Tax Exporting and the Commerce Clause: Reflections on *Commonwealth Edison***

**Charles E. McLure, Jr.**  
Working Paper No. 746  
September 1981  
JEL Nos. 320, 720

This paper appraises the conflicting contentions found in the majority and dissenting opinions in *Commonwealth Edison Co. et al. v. Montana et al.* about the feasibility of basing findings of constitutionality under the Interstate Commerce Clause on the results of incidence analysis. Severance taxes, property taxes, corporate income taxes levied by both producing and consuming states, and gross receipts taxes levied by consuming states in conjunction with price controls are considered. Factors affecting tax exporting by producing states include the degree of geographic concentration of natural resources, cartelization by producing states, the mobility of various resources, international competition, natural substitutability, government regulations, the prevalence of long-term contracts, and transportation costs. The analysis of tax exporting is sufficiently complicated that attempting to base constitutionality on estimates of tax exporting is fraught with danger, especially in times of rapid economic and institutional change, in part because it is so difficult to know when the tax exporting question is being asked properly.

### **Capital Structure Equilibrium under Incomplete Market Conditions**

**Lemma W. Senbet and Robert A. Taggart, Jr.**  
Working Paper No. 747  
September 1981  
JEL No. 52I

Most discussions of corporate capital structure have been set in the context of a complete capital market. In this paper, we study the determinants of capital structure for the case of incomplete markets, manifested in the form of divergent borrowing and lending rates. We argue that firms have a natural incentive to tailor their financing choices so as to narrow such divergences. While this implies an optimal capital structure for firms in the aggregate, competition will drive out profits, and the capital structure of any individual firm may still be a matter of indifference. Firms' incentive to try to complete the market provides a rationale for corporate finance even in a taxless environment. This incentive may also shed light on such related issues as corporate mergers, the use of complex securities, and the role of financial intermediaries

## Aspects of the Optimal Management of Exchange Rates

Jacob A. Frenkel and Joshua Aizenman

Working Paper No. 748

September 1981

JEL No. 430

This paper analyzes economic aspects of the optimal management of exchange rates. It shows that the choice of the optimal exchange rate regime depends on the nature and the origin of stochastic shocks that affect the economy. Generally, the higher the variance of real shocks that affect the supply of goods, the stronger the desirability of fixing exchange rates becomes. The rationale for that implication is that the balance of payments serves as a shock absorber that mitigates the effect of real shocks on consumption. The importance of this factor diminishes as the economy's access to world capital markets increases. On the other hand, the desirability of exchange rate flexibility increases as the variances of the shocks to the demand for money, the supply of money, foreign prices, and purchasing power parities increase. All of these shocks exert a similar effect and their sum is referred to as the "effective monetary shock." It is also shown that the desirability of exchange rate flexibility increases as the propensity to save out of transitory income grows. When the analysis is extended to an economy that produces traded and nontraded goods, it is shown that the desirability of exchange rate flexibility diminishes as the share of nontraded goods relative to traded goods grows and the elasticities of demand and supply of the two goods declines.

## Real Exchange Rate Overshooting and the Output Cost of Bringing Down Inflation

Willem H. Buiter and Marcus M. Miller

Working Paper No. 749

September 1981

JEL No. 431

Implementing a gradualist policy of monetary contraction, in an open economy with a freely floating exchange rate but nominal inertia in domestic labor costs, can lead to prompt and substantial changes in the nominal and real exchange rates. One of the virtues claimed for such exchange rate overshooting, however, is its immediate effect on the price level and so on domestic wage and price inflation.

In this paper we show that, in a model that is "super-neutral" and has nominal inertia in both the level of labor costs and their trend or core rate of growth, this early overshooting of the exchange rate does not succeed in

cutting the output costs of reducing steady-state inflation. Those output and unemployment costs, which are initially avoided by overvaluing the currency, have to be paid later when this overvaluation is corrected. Relative to other policies that achieve the same effect on steady-state inflation, exchange rate overshooting brings inflation down more quickly.

## Career Patterns of College Graduates in a Declining Job Market

Richard B. Freeman

Working Paper No. 750

September 1981

JEL No. 824

This study uses cohort data from the Current Population Survey and the National Longitudinal Survey for men aged 14–24 in 1966 to examine the earnings growth of college graduates relative to high school graduates during the 1970s—a depressed market for graduates. The principal finding is that the longitudinal/cohort earnings profile for college graduates *flattened* markedly relative to that for high school graduates in the 1970s. With smaller growth rates of earnings for the college educated in the period than in previous decades, the evidence lends no support to the hypothesis that the graduates who suffered economic losses during the period will recover the traditional college advantage as time proceeds. The finding of the flattening of the longitudinal profile of college graduates contrasts sharply with the steepening of cross-section profiles in the period, raising serious doubts about the validity of standard cross-section analyses of age-earnings curves to assess lifetime income profiles and investments in training.

## Have Black Labor Market Gains since 1964 Been Permanent or Transitory?

Richard B. Freeman

Working Paper No. 751

September 1981

JEL No. 824

One of the most important questions about black economic gains after 1964 is whether they are permanent or transitory. This study examines the relative economic progress of black cohorts and of individual black workers in longitudinal samples to evaluate the permanence of changes. The preponderance of evidence runs against the proposition that the post-1964 advances have been transitory, or illusory. Measured both by earnings of workers and by occupational attainment, significant progress has been made by blacks in the 1970s. Measured by the increase in earnings of specific cohorts, black gains did *not* dissipate due to slow growth of earnings.



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## **Union Wage Practices and Wage Dispersion within Establishments**

**Richard B. Freeman**

Working Paper No. 752

September 1981

JEL No. 830

This study uses establishment level data to examine the effect of unionism on the wage structure *within* establishments. The major finding is that unionism substantially reduces within-establishment dispersion of wages, in part through explicit wage practices such as single rate or automatic progression modes of payment as opposed to merit reviews and case-by-case determinations. Dispersion of wages is smaller among organized than among unorganized plants, but modestly so. Overall, the evidence suggests a major role for explicit union wage policies on the dispersion of wages both within firms and in the economy as a whole.

## **Inflation, Tax Rules, and the Accumulation of Residential and Nonresidential Capital**

**Martin Feldstein**

Working Paper No. 753

September 1981

JEL No. 320

This paper analyzes the effect of the interaction between tax rules and inflation on the size and allocation of the capital stock with particular emphasis on the role of owner-occupied housing. The analysis is developed in the framework of an economy that is in equilibrium and in which a constant fraction of disposable income is saved. In this model I show that, with current U.S. tax laws, an increase in the rate of inflation reduces the equilibrium amount of business capital employed in the economy and raises the amount of housing capital. The analysis also shows that a higher rate of inflation lowers the real net-of-tax rate of return to the provider of business capital. In a richer model than the current one, that is, a model in which the rate of personal saving is an increasing function of the net rate of return, a higher inflation rate would therefore lower the rate of saving.

The present analysis also shows that permitting firms to depreciate investments more rapidly for tax purposes increases the accumulation of business capital but that, unless firms are permitted to expense all investment immediately, an increase in inflation continues to depress the accumulation of business capital.

## **Intergenerational Effects of the Distribution of Income and Wealth: The Utah Experience, 1850-1900**

**J. R. Kearl and Clayne L. Pope**

Working Paper No. 754

September 1981

The relationship between the wealth or income of parents and children is an important economic issue in both positive and normative senses. In this paper, we estimate elasticities of the income or wealth of sons with respect to the wealth of their fathers for a sample of households in nineteenth-century Utah. We find the elasticity relating the wealth of fathers to sons to range from .10 to .34 depending on the variables held constant, such as occupation, age, and residence. Elasticities based on observation of the wealth of fathers and sons in the same year were higher than those based on a lagged value of the fathers' wealth. The death of the father prior to observation of the sons' wealth increased the elasticity about threefold. The elasticity between the income of sons and wealth of fathers was low (.09 to .21) but significant even though the sons' incomes were observed fifteen years after the wealth of fathers. In general, the data suggest a persistent relationship between the economic status of parents and their children with substantial regression toward the mean so that an economic elite was unlikely to be based upon intergenerational transmission of economic success.

## **Accelerating Inflation, Nonassumable Fixed-rate Mortgages, and Consumer Choice and Welfare**

**Patric H. Hendershott and Sheng Cheng Hu**

Working Paper No. 755

September 1981

JEL Nos. 130, 932

This paper measures the impact of nonassumable, fixed-rate, long-term mortgage financing on household mobility and housing demand during a period of accelerating inflation (1965-74). We calculate that typical households who bought houses during the 1964-71 period and utilized this type of financing would not have moved until the 1975-77 period despite rising incomes and a sharp fall in the real rental price, or user cost, of housing.

We conclude that the nonassumable, fixed-rate mortgage is largely responsible for both sluggish housing demand in the 1967-74 period and its surge in the 1976-79 period. Housing activity would have been far more stable had variable-rate mortgages been employed. Finally, the enormous gap between current mortgage rates and those existing in the 1970s, and the resultant huge capital gains on existing mortgages, does not bode well for housing activity in the near term future.

## **Permanent Income, Liquidity, and Expenditure on Automobiles: Evidence from Panel Data**

**Ben Bernanke**

Working Paper No. 756

September 1981

JEL No. 131

Several recent papers have tested the permanent income-rational-expectations hypothesis using data on nondurable or semidurable consumption. I show how this approach can be extended to the case of durables. An application to panel data on automobile expenditures reveals no evidence against the permanent income hypothesis. This result is unchanged in subsamples segregated by family holdings of liquid assets.

## **Tax Reform and Corporate Investment: A Microeconomic Simulation Study**

**Michael A. Salinger and Lawrence H. Summers**

Working Paper No. 757

September 1981

This paper develops a methodology for simulating the effects of alternative corporate tax reforms on the stock market valuation and investment plans of individual firms. Estimated effects are then derived for the thirty Dow Jones companies. All estimates are based on extensions of Tobin's  $q$  theory of investment. The results here provide further strong microeconomic support for the  $q$  theory: the  $q$  theory approach provides a superior method for estimating the effects of investment incentives because it recognizes the effects of changes in the cost of capital on the desired level of output.

Our results suggest that some potential tax reforms could have potent effects, which would vary widely among firms. For example, complete indexation of the tax system would raise the Dow Jones average by an estimated 7.6 percent. The variance among companies is substantial, though, with the effect ranging from -13 percent for Sears to 20 percent for American Brands.

## **Capital Gains Taxation in an Economy with an "Austrian Sector"**

**Michael Rothschild and Daniel J. Kovenock**

Working Paper No. 758

September 1981

This paper examines the effects of a proportional capital gains tax in an economy with an "Austrian sector" (with wine and trees) and an ordinary sector. We analyze the effect of capital gains taxation (on both an accrual and a realization basis) on the efficiency with which resources are used within the Austrian sector. Since time is the only input that can be varied in the Austrian sector, this amounts to looking at the effect of capital gains taxation on the harvesting time or selling time of assets.

Accrual taxation decreases the selling time of Austrian assets; realization taxation decreases the selling time of some Austrian assets and leaves it unchanged for others. Inflation further reduces the selling time of assets taxed on an accrual basis; often, but not always, inflation increases the selling time of Austrian assets taxed on a realization basis. These results suggest that the capital gains tax can reduce the holding period of an asset. However, there is a sense in which such taxes (at least when levied on a realization basis) discourage transactions and increase holding periods. It is never profitable to change the ownership of an Austrian asset between the time of the original investment and the ultimate harvesting of the asset for final use.

We also examine the effect of capital gains taxation on the efficiency of the allocation of investment between sectors. No neutrality principles emerge when ordinary investment income is taxed at the same rate as capital gains income. Finally, we analyze the effect of the special tax treatment of capital gains at death and find that the current U.S. tax system, under which capital gains taxes are waived at death, encourages investors to hold assets longer than they otherwise would.

## **Anticipated and Unanticipated Oil Price Increases and the Current Account**

**Nancy Peregrim Marion**

Working Paper No. 759

September 1981

JEL No. 431

This paper examines the current-account response to anticipated future increases and unexpected temporary or permanent increases in real oil prices. The analysis is conducted using an intertemporal two-period model of a small open economy that produces both traded and nontraded goods and imports its oil.

The paper identifies the channels through which various types of oil price increases affect the current account. The inclusion of nontraded investment and consumer goods permits oil price increases to generate intertemporal and static substitution effects in production and consumption that alter net international saving. Moreover, the relative oil-to-value-added ratio in the traded and nontraded sectors plays a crucial role in shaping these substitution effects and hence the current-account response.

## **Anticipated Money, Inflation Uncertainty, and Real Economic Activity**

**John H. Makin**

Working Paper No. 760

September 1981

JEL No. 310

This paper critically examines a number of maintained hypotheses that are necessarily being tested along with the basic notion derived from the rational expectations

(RE) formulation of Lucas that "only unanticipated money matters." The trend stationary representation of secular real output of Lucas and others is replaced by a difference stationary representation found by Nelson and Plosser to be consistent with U.S. historical data. The impact of inflation uncertainty on real activity is considered. Attention is paid to possible mismeasurement of agents' ex ante anticipated money growth. It is found that three alternative measures of anticipated money growth produce a stable impact on growth of output and employment. Contemporaneous and lagged values of unanticipated money growth have no significant additional explanatory power in the presence of any one of the three measures of anticipated money growth. Beyond this, it is impossible to reject the hypothesis that the initial positive real impact of anticipated money is *not* temporary. Inflation uncertainty is found to act as a significant depressant of real economic activity in the presence of all tested combinations of anticipated and unanticipated money growth.

### **The Index of Leading Indicators: "Measurement without Theory," Twenty-five Years Later**

**Alan J. Auerbach**  
Working Paper No. 761  
September 1981  
JEL No. 132

The index of leading economic indicators, first developed by the NBER, remains a popular informal forecasting tool in spite of the original criticism that its use represents "measurement without theory." This paper seeks to evaluate the performance of the index in comparison to alternative time-series methods in predicting business cycle behavior.

While the actual method of choosing the weights for the twelve series included in the index is essentially unnecessary (because the resulting series is indistinguishable from another with uniform weights), the series itself helps explain business cycle behavior, and outperforms an index with econometrically chosen weights.

### **The Holding Period Distinction of the Capital Gains Tax**

**Steven Kaplan**  
Working Paper No. 762  
September 1981  
JEL No. 323

U.S. tax law distinguishes between short-term and long-term capital gains. By taxing long-term gains at a lower rate, the law creates an incentive for investors to postpone the realization of short-term gains. This study examines the lock-in effect induced by the differential tax treatment of long- and short-term gains. Analysis of data on corporate stock transactions from 1973 suggests

that the lock-in effect is large and thus causes investors to alter their investment portfolios. The existence of such an effect is inefficient and results in a reduction in capital market efficiency.

The inefficiency might be justified if there were convincing reasons that supported the existence of the holding period distinction. It is commonly argued, for instance, that eliminating the distinction would encourage short-term speculation at the expense of long-term commitment to capital. It is also claimed that this would result in a loss of revenue to the government. This study relies on IRS data and simulations using the NBER—TAXSIM file to examine the validity of these arguments. The results of this study suggest that the holding period distinction is not very effective in deterring speculation and does not increase government revenues; in fact, it may decrease them.

### **Partial Retirement and the Analysis of Retirement Behavior**

**Alan L. Gustman and Thomas L. Steinmeier**  
Working Paper No. 763  
September 1981  
JEL No. 800

This paper examines the phenomenon of partial retirement. Topics covered include: (1) the quantitative importance of partial retirement; (2) institutional constraints, in addition to mandatory retirement, which limit the opportunity to retire partially in the main job; (3) the effect of these constraints on the specification of the relevant structural equations in a life-cycle retirement model; (4) the impact of standard explanatory variables on four outcomes—complete retirement, partial retirement both in and outside the main job, and nonretirement; (5) the importance of partial retirement even for those who do not face mandatory retirement, are not covered by a pension, and are healthy; and (6) the sensitivity of results, based on a dichotomous retirement variable, as to whether the partially retired are classified as retired or not.

A number of studies have either treated partial retirement inappropriately or have adopted unrealistic assumptions about the opportunity set facing potential retirees. Our findings call their results into question.

### **The Potential for Using Excise Taxes to Reduce Smoking**

**Eugene M. Lewit and Douglas Coate**  
Working Paper No. 764  
September 1981  
JEL No. 913

By estimating the price elasticity of demand for cigarettes, we examine the potential for reducing cigarette smoking through increases in cigarette excise taxes. Using information on individual smoking behavior for a sample of adults in the 1976 Health Interview Survey, we

estimate the price elasticity of demand (for adults) for cigarettes to be  $-.45$ . Moreover, we find that price has its greatest effect on the smoking behavior of young males, and that it operates primarily on the decision to begin smoking regularly rather than via adjustments in the quantity of cigarettes smoked. It follows that if future reductions in cigarette smoking are desired, federal excise tax policy can be a potent tool to accomplish this goal, but only in the long run. An excise tax increase, if maintained in real terms, would discourage smoking participation by successive cohorts of young adults, and reduced smoking levels would be reflected in aggregate smoking as these cohorts mature. In the short run, however, the impact of an excise tax increase on aggregate cigarette consumption would be relatively small.

### **Low-cost Student Labor: The Use and Effects of the Subminimum Wage Provisions for Full-time Students**

**Richard B. Freeman, Wayne Gray, and Casey Ichniowski**  
Working Paper No. 765  
September 1981  
JEL No. 824

Section 14(b) of the Fair Labor Standards Act permits certain classes of employers to pay full-time students a wage 15 percent below the legislated minimum wage. This study develops a new data base, using administrative records, our own survey of participating company and establishment managers, and published information on local labor markets, to investigate employer responses to a subminimum wage program.

Our analysis of the full-time student certification program yields four general conclusions.

(1) While the most important users of the program are institutions of higher education, certain noneducational employers in the retail and service sectors employ a sufficiently large and increasing number of students below the minimum wage to suggest that the program has considerable attractiveness in the private sector.

(2) Area labor market conditions are a major determinant of which establishments that have permits to pay students subminimum wages in fact do make use of the program, and the extent to which they use it. Establishments in areas characterized by high wages and low levels of unemployment, implying high costs in employing or locating substitute labor, make more use of student subminimum workers than establishments in areas with lower costs for substitute labor. The magnitude of the effect of area wage is, however, sensitive to the precise specification of the full-time student employment equation and the variable used to measure area wage. Although this sensitivity leads to variations in the estimation of the elasticity of substitution between student and other labor, reasonable estimates of this elasticity range from 0.5 to 1.0.

(3) Among company characteristics, unionism reduces program usage while certain company incentives promote use of the program.

(4) Restrictions in the law on hours worked at the subminimum appear to be a major reason for failure to employ students under this program.

### **Exchange Rate Determination and the Demand for Money**

**Craig S. Hakkio**  
Working Paper No. 766  
September 1981  
JEL No. 431

This paper examines the conventional monetary equation of exchange rate determination. Under certain conditions of exogeneity, one can write the price level, at home and abroad, as the ratio of the nominal money supply to the demand for real money balances. Then, since the exchange rate is the domestic price of foreign exchange, one can equate the exchange rate to the ratio of domestic to foreign prices. This then allows one to write, and estimate, the exchange rate as a function of the money supply differential, income differential, and interest rate differential. If the domestic and foreign money demand errors are autocorrelated, and if deviations from purchasing power parity are autocorrelated, tests based on the above model may be invalid. Only if all autoregressive parameters are equal will test results be valid. A full information maximum likelihood procedure is used to estimate and test the assumptions necessary for the conventional procedure to be correct. Finally, two alternative models of exchange rate determination are considered to illustrate the importance of introducing the error terms at the beginning of the analysis.

### **Employee Valuation of Pension Claims and the Impact of Indexing Initiatives**

**James E. Pesando**  
Working Paper No. 767  
September 1981  
JEL No. 824

There is discussion in both Canada and the United States of the government's requiring private pension plans to provide contractual cost-of-living protection. This paper employs both an auction and an implicit contract model to identify the compensating wage differentials required of possible indexing initiatives. The contract model, motivated by the prevalence (especially in Canada) of ad hoc cost-of-living adjustments to pensions in pay, presumes that workers have a call option on the investment earnings in excess of the interest rate assumption used to value the plan. The case for policy action would appear to rest on either (1) the assumption that workers misperceive the value (and, possibly, the security) of pension benefits, or (2) the presumption that society should subsidize pension income by providing to pension plans an investment vehicle (such as an index bond) whose risk-return characteristics cannot be duplicated by portfolios of existing assets.

## **Schooling and Health: The Cigarette Connection**

**Phillip Farrell and Victor R. Fuchs**

Working Paper No. 768  
September 1981

Numerous studies by economists during the past decade have revealed a large, statistically significant correlation between health and years of schooling after controlling for differences in income and other variables. Cigarette smoking is a likely intervening variable because of the strong effect of smoking on morbidity and mortality, and because there is a strong negative correlation between smoking and years of schooling—at least at high school levels and above. This paper tests the hypothesis that schooling causes differences in smoking behavior. We use retrospective smoking histories of 1183 white, non-Hispanic men and women who had completed twelve to eighteen years of schooling. The data were collected in 1979 by the Stanford University Heart Disease Prevention Program from randomly selected households in four small California cities.

The most striking result is that the negative relation between schooling and smoking observed at age 24 is accounted for by differences in smoking behavior present at age 17, when all subjects were still in approximately the same grade. We conclude that additional years of schooling cannot be the cause of differential smoking behavior; one or more “third variables” must cause changes in both smoking and schooling. Analysis of smoking by cohort reveals that the schooling–smoking correlation developed only after the health consequences of smoking became widely known; it has remained strong even in the most recent cohorts. This implies that the mechanism behind the schooling–smoking correlation may also give rise to the schooling–health correlation.

## **Collective Bargaining and Compulsory Arbitration: Prescriptions for the Blue Flu**

**Casey Ichniowski**

Working Paper No. 769  
September 1981  
JEL No. 832

This paper reveals that municipal police departments are much less likely to strike in states that have collective bargaining laws than in states with no bargaining law for police or where police bargaining has been specifically outlawed. Unlike previous research that has used the state as the unit of observation, this study examines the decision to strike at the municipal level for a pooled cross-section of 2998 municipal police departments.

Pooled cross-section estimates from this study reveal two important relationships. First, municipalities in states that provide for any form of collective bargaining experience significantly fewer police strikes than do municipalities in areas where there is no law or where police bargaining is specifically outlawed. Second, among states with duty-to-bargain rights for police, the areas with compulsory arbitration provisions experience significantly fewer strikes. Fixed-effect estimates that consider strike probabilities of the same cities under different statutes qualify the first finding. Municipalities that changed from a “no law” to a bargaining law environment were less likely to experience strikes even while in the “no law” environment than were municipalities that had always been “no law”. However, fixed-effect estimates confirm the finding that a compulsory arbitration provision significantly reduces propensities to strike. Interviews with representatives of cities that experienced a police strike suggest that state agencies responsible for administering arbitration mechanisms could help to avoid strikes by speeding the arbitration process after the expiration of contracts.

## **Capital Mobility and the Scope for Sterilization: Mexico in the 1970s**

**Robert E. Cumby and Maurice Obstfeld**

Working Paper No. 770  
September 1981  
JEL No. 431

This is an empirical study of the Banco de Mexico's monetary policy during the 1970s, particularly the Mexican response to the liquidity effects of balance-of-payments disequilibria and the extent to which capital mobility undermined monetary control. Estimates of a Banco de Mexico reaction function suggest that the Mexican central bank attempted to sterilize reserve flows through offsetting movements in domestic credit, at least over the second half of the decade. This finding suggests that estimates of the capital-account response to domestic credit expansion should be derived from a structural model, and we accordingly estimate an aggregative three-equation model of Mexican financial markets. The paper distinguishes between the short-run or one quarter capital-account offset and a hypothetical long-run offset that would obtain under instantaneous asset-market adjustment. The model implies that, depending on the method of monetary expansion, between 30 and 50 percent of an expansion in domestic credit was offset by capital outflow in the same quarter. The implied long-run offsets range from 50 to 76 percent. These offset coefficients indicate that the Banco de Mexico's monetary control was exercised at a substantial cost in terms of reserve volatility.

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## **The Interaction between Research and Public Policy: The Case of Unemployment Insurance**

**Daniel S. Hamermesh**  
Working Paper No. 771  
September 1981  
JEL Nos. 820, 910

This essay examines the role of economic research on the recommendations of the National Commission on Unemployment Compensation, and the likely impacts on policy both of that commission and of economists' research findings. Using a questionnaire addressed to commission members, I find that: (1) most became quite aware of the results of research on the labor market effects of unemployment insurance, with the degree of recognition proportional to the strength of the consensus among economists on a particular result; (2) the members had little awareness of the identity of particular economists who had done the research; and (3) although the members claimed their recommendations were influenced importantly by research, that influence is difficult to detect in the commission's report. Because that report goes against the tenor of current labor market policy, its short-run impact will likely be small. Since the focus of interest in policy will change over time, its long-term influence may also not be great. Economic research, though, is shown to have had an immediate impact in three specific cases. Its long-run effect, by conditioning the policy discussion, has been and will likely be substantial.

## **The Effects of Pensions and Earnings on Retirement: A Review Essay**

**Olivia S. Mitchell and Gary S. Fields**  
Working Paper No. 772  
September 1981  
JEL No. 800

Does retirement behavior react predictably to economic incentives? Evidence on this question would be useful to policymakers responsible for work and retirement programs affecting the elderly. This paper reviews some lessons and limitations of recent economic literature on pensions, earnings, and retirement. Section I develops the life-cycle context for analyzing this problem. Section II examines the theoretical literature and Section III reviews the empirical literature.

## **The International Economics of Transitional Growth: The Case of the United States**

**Laurence J. Kotlikoff, Edward E. Leamer, and Jeffrey Sachs**  
Working Paper No. 773  
September 1981

This paper develops a general equilibrium, two-country, two-commodity, dynamic simulation model of international trade in commodities and financial claims. The model generalizes the Heckscher-Ohlin static theory of trade by incorporating costs of quickly adjusting levels of capital stocks in particular industries; capital mobility is permitted in the short run, but at a price. The model predicts Heckscher-Ohlin relationships, including factor price equalization, in the long run, but not during the economy's transition path to its ultimate steady state. An interesting feature of the model is that it provides a determinate solution to the long-run international allocation of the world's capital stock. This is true despite the fact that the Rybczynski theorem holds in the long run.

The simulation model of international trade with costly capital stock adjustment appears capable of explaining many features of the patterns of factor price equalization, international investment, and changes in comparative advantage that have characterized the postwar period.

## **Prices and Terms of Trade for Developed-Country Exports of Manufactured Goods**

**Irving B. Kravis and Robert E. Lipsey**  
Working Paper No. 774  
September 1981  
JEL Nos. 123, 227, 421

This paper contributes some new measurements to the discussion of trends in the terms of trade between exports of manufactured goods from countries and exports of primary products from developing countries. The new measures are price indexes for manufactured goods derived from price data rather than from unit value data and with some corrections for change in quality.

Our calculations indicate that the prices of manufactured goods exported by developed countries to developing countries have risen over twenty years or so by 75 percent, as compared to the 140 percent rise shown by the generally used United Nations unit value indexes. The decline in terms of trade for these goods relative to primary products has been almost 50 percent over this period.

Over the last hundred years, fluctuations in the terms of trade of manufactured goods relative to primary products have been very wide, as far as we can tell from the inadequate measures we have. Impressions about trends have been highly dependent on choices of beginning and end years. There is very little evidence for a long-run trend in either direction.

## Monetary Aggregates as Targets: Some Theoretical Aspects

Charles Freedman

Working Paper No. 775

September 1981

JEL No. 311

In the mid-1970s the Bank of Canada, along with a number of other central banks, began to set explicit targets for monetary growth and to emphasize the long-run role of monetary aggregates in controlling the rapid upward trend of prices. There are three distinct ways of viewing and interpreting a policy of setting growth targets for monetary aggregates. The first is associated with the work of William Poole; the second is derived from the reduced-form model initially developed at the Federal Reserve Bank of St. Louis; and the third, which I have labeled the feedback-rule approach, is related to the techniques developed within central banks to implement the policy of monetary targeting. In this paper I set forth the logic and examine the implications of these three methods when the principal aim of policy is to reduce the rate of inflation. I also examine the question of gradualist versus "cold-shower" policies and the criteria for selecting a monetary aggregate as a policy target.

## Currency Diversification and Export Competitiveness: A Model of the "Egyptian Disease"

Jorge Braga de Macedo

Working Paper No. 776

October 1981

JEL Nos. 431, 121

This paper presents a dynamic portfolio model under currency inconvertibility that rationalizes the recent Egyptian experience: real exchange rate appreciation and currency diversification following an increase in oil exports, and a partial financial liberalization after 1976. The two shocks are linked because the price of manufacturing exports relative to oil is also the premium of the black market rate over the official exchange rate. The effects of various official exchange rate policies on the temporary equilibrium values of the premium and the real wage, and on the steady-state values of asset stocks, are examined. A review of the Egyptian experience shows that, as the model suggests, the official devaluation in 1979 was ineffective against the "Egyptian disease." Therefore, little can be expected from the 1981 devaluation. In light of the results of the model, a crawling peg policy may have certain advantages over current policy.

## Agency, Delayed Compensation, and the Structure of Executive Remuneration

Jonathan Eaton and Harvey S. Rosen

Working Paper No. 777

October 1981

In this paper we examine the factors affecting the structure of executives' compensation packages. We focus particularly on the role of various types of delayed compensation as means of "bonding" executives to their firms.

The basic problem is to design a compensation package that rewards actions that are in the long-run interest of the stockholders. Firms must take into account: (1) their ability to distinguish between unfortunate circumstances and mismanagement; (2) the extent to which a compensation package forces the executive to face risks beyond his control; and (3) the willingness of a given executive to bear this risk.

We use our theory to interpret some data on executive compensation from the early 1970s. The results are generally in line with the theoretical predictions.

## The Effects of Incomes Policies on the Frequency and Size of Wage Changes

John Pencavel

Working Paper No. 778

October 1981

Along with housing rents, wages have frequently been described as the "stickiest" prices in the economy, rarely adjusted more than once a year. Because of this stickiness (which arises from the transactions costs involved in changing wages), a distinction exists between the adjustment of wages and the size of that adjustment. This distinction has important implications for empirical investigations of the determinants of aggregate changes in money wages. The equations fitted in such studies are almost invariably plagued with aggregation bias unless the nonsynchronous pattern of wage settlements in different sectors of the economy is taken into account. This is a particularly relevant issue in evaluating the effectiveness of incomes policies, since some policies have operated by postponing the implementation of new wage settlements (in which case they are directed toward the occurrence of the event) while other policies have taken the form of specifying a permissible ceiling on wage increases (in which case they are designed to affect the extent of occurrence of the event, but not its occurrence per se). One purpose of this paper is to reevaluate the effectiveness of incomes policies using information from one industry both on the frequency of wage settlements and on the size of wage changes when a settlement takes place. The empirical work leads one to conjecture whether the apparent "statistical significance" reported by researchers with respect to the performance of variables in models of *aggregate* wage changes primarily reflects the effects of these variables on the *probability* of wages being adjusted rather than on the *magnitude* of wage changes conditional upon wages being adjusted.

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