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# NBER Reporter

NATIONAL BUREAU OF ECONOMIC RESEARCH, INC.

WINTER 1986/7

## Program Report

### Financial Markets and Monetary Economics

Benjamin M. Friedman

Developments within the U.S. financial markets have attracted widespread attention and sometimes have generated substantial concern during the two years since the activities of this program were last described in the *NBER Reporter*.<sup>1</sup> In many cases, prices and yields on financial assets have shown major variation during this period, sometimes in ways apparently out of character with much of the nation's prior financial history. At the same time, the patterns of holding of assets and issuing of liabilities exhibited both by government and by the private sector (including businesses as well as households) have been extraordinary in a variety of ways. Moreover, financial market institutions have continued to evolve and to innovate during this period, so that the unusual movements of both prices and quantities in these markets have often represented more than just fresh observations on an unchanging structure.

The most highly visible movements of financial asset prices and yields in the United States since mid-1984 have been historically large increases in bond and equity prices, and correspondingly large declines in interest rates and earnings/price ratios. For the most part, however, these declines in *nominal* yields have not carried over to yields on an after-inflation basis. Instead, the unusually high *real* rates of return that have become the hallmark of the U.S. financial markets in the 1980s have persisted throughout this period.

The household sector of the U.S. economy has responded by expanding both sides of its aggregate balance sheet, borrowing heavily to finance increased holdings of both financial and nonfinancial assets. As a result of this shift in portfolio behavior, monetary "velocity" has shown not just the usual short-run volatility

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This issue of the *Reporter* highlights the Bureau's Program in Financial Markets and Monetary Economics. Next, Stanley Fischer describes his research on the reduction of inflation; Robert J. Shiller discusses the volatility of stock and bond prices; and Richard C. Marston assesses Japanese competitiveness. After the quarterly Economic Outlook Survey are biographical sketches, news of NBER conferences, the Conference Calendar, and other NBER news and reports. The *Reporter* concludes with short summaries of recent NBER Working Papers.

but, more importantly, a sustained, cumulative departure from prior trend. In addition, the household sector today is more heavily indebted in relation to income than at any time since World War I.

The economy's business sector has also borrowed heavily during these years. In contrast to households, though, it has done so largely in order to substitute debt for equity, rather than to finance any unusual accumulation of either financial or nonfinancial assets. As a result, transactions retiring corporate equity have reached a pace of \$100 billion per annum. Despite the

<sup>1</sup>NBER Reporter, Summer 1984.

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slowdown of business capital spending, the U.S. corporate business sector is also more heavily indebted in relation to income than at any time since World War II.

Monetary and fiscal policies in the United States have also undergone significant movement since mid-1984. These policy changes presumably have played a major role in shaping the U.S. financial environment and, in large part through the financial markets, the course of U.S. nonfinancial economic activity. The Federal Reserve System has apparently deemphasized (or even abandoned) its earlier commitment to monetary growth targets, at least for the narrow M1 concept, allowing annual money growth well in excess of its stated targets in each of 1983, 1985, and 1986 to date. Correspondingly, nominal interest rates have been substantially less volatile during this period than earlier than in the 1980s. By contrast, fiscal policy has undergone little change throughout the decade, with the federal budget deficit continuing to widen both absolutely and on a high-employment basis. After only a small decline in 1984, the series of record deficits that began in 1981 has continued with another new record deficit in the 1985 fiscal year, and then another in fiscal 1986.

From a research perspective, these departures from prior experience present both stimulus and opportunity. The stimulus springs from the continual suggestion that what happens in the financial markets can, and often does, affect importantly such basic aspects of the economy's nonfinancial performance as the level of business activity, the acceleration or deceleration of inflation, and international equilibrium or imbalance, as well as from the constant reminder that the financial markets are, in themselves, an endlessly fascinating window on many aspects of economic behavior at the individual and institutional level. The opportunity arises from the fundamental dependence of economics, like any nonlaboratory science, on real-world observations—with special emphasis on experience that adds significant variation to the already available data—as the basis for empirical verification and measurement.

Not surprisingly, this period has been a time of energetic activity among researchers in the Bureau's Financial Markets and Monetary Economics program.

### The Determination of Interest Rates

By far the most active area of research in the program during the past two years has been the determination of interest rates and asset prices. The emphasis on this subject is hardly surprising in view of its traditionally important role in familiar theories of how government policy and other forces affect nonfinancial activity. In addition, the wide swings in interest rates and asset prices within recent years not only have provided new data capable of supporting or rejecting specific hypotheses about how financial markets determine these prices but also have highlighted this complex process as an aspect of economic behavior worth investigation on its own terms.

Robert Shiller, John Campbell, and Charles Nelson have done new research on the "term structure" relationship among interest rates on otherwise comparable debts of different maturities.<sup>2</sup> They examined aspects of the basic "expectations" theory that represents a long-term interest rate as an expected forecast of future short-term interest rates—or, alternatively, equates the expected holding-period returns on long- and short-term debts—up to some difference that is constant over time. In one paper, Shiller argued that the evidence is consistent with the market's setting interest rates in terms of conventions, or rules of thumb, which make long-term rates follow short-term rates according to distributed lag patterns. By contrast, in joint work, Campbell and Shiller found that the forecast of short-term rates that the market builds into long-term rates behaves as if it were an optimal short-rate forecast. Nelson argued that the apparent flattening of the yield curve typically observed at longer maturities is explainable as a consequence of the persistence of anticipated short-term interest rates but also found, in an investigation of shorter-term rates, specific maturity effects in the form of deviations from predicted yield curve relationships.

*Interest Rates and Risk.* Because most empirical tests typically reject the proposition that risk does not matter for asset pricing, the role of risk in affecting the relative structure of interest rates on different debts is also a long-standing question. Campbell, Richard Clarida, Takatoshi Ito, Terry Marsh, and Angelo Melino have all done new research on different aspects of this question.<sup>3</sup> In joint work, Campbell and Clarida showed that the risk premiums evident in uncovered foreign asset positions move sufficiently closely with those evident in the term structure of Eurodollar interest rates to warrant treating the two as if they were the result of a single source of risk. By contrast, Ito also tested for the presence of risk premiums in uncovered interest parity relationships for debts denominated in different currencies, but he found no significant evidence for such premiums. Marsh found that the returns to investing in U.S. government bonds are better explained by the relationship between bond risk and the variation of aggregate con-

sumption in the economy than by the relationship between bond risk and the risk associated with holding equities. Melino undertook a broad-based survey of work in this area, cataloging different theories about how risk affects interest rates, evaluating the available empirical evidence from a variety of studies.

*Interest Rates and Inflation.* Price inflation is another factor that economists have long thought to bear on interest rate determination. James Wilcox, Lawrence Summers, Robert Barsky, and Alex Kane studied the connection between interest rates and inflation.<sup>4</sup> Using data from the market for indexed bonds issued by the U.K. government, Wilcox found that expected real long-term interest rates vary with forecasts about the state of economic activity and about the tightness or ease of monetary policy, but not with forecasts of inflation; hence expected real interest rates do vary systematically, but nominal rates nevertheless incorporate expected inflation per se on a one-for-one basis. Kane examined nominal interest rates in the Eurocurrency markets and found that these rates provide valuable information about expected inflation in the United States and the United Kingdom, but not in other European countries. By contrast, Summers argued, on the basis of movements of interest rates and inflation rates over very long periods of time, that this "Fisher effect" is not reliably present. In joint work, Barsky and Summers suggested explaining "Gibson's Paradox" (the observed positive correlation between nominal interest rates and the price level) as the result of the working of the gold standard over much of the relevant history.

*Interest Rates and Taxes.* James Poterba, Joe Peek, and Wilcox have done new research focused on still another familiar factor that plausibly affects interest rates: taxes.<sup>5</sup> Poterba's analysis of the influence of personal and corporate tax rates on the yield spread between taxable and tax-exempt securities supported the traditional view that banks are the main holders of short-term municipal securities, while individuals are the main holders of long-term municipals. Reforms such as increasing reliance on short-term financing, or issuing long-term debt in floating-rate form, therefore, would reduce the real interest cost of municipal borrowing. Peek and Wilcox found evidence indicating an even greater role for individual investors and hence even less importance of corporate taxes as opposed

<sup>2</sup>R. J. Shiller, "Conventional Valuation and the Term Structure of Interest Rates," NBER Working Paper No. 1610, April 1985; J. Y. Campbell and R. J. Shiller, "Cointegration and Tests of Present-Value Models," NBER Working Paper No. 1885, April 1986; and C. R. Nelson and A. F. Siegel, "Long-Term Behavior of Yield Curves," NBER Working Paper No. 1789, January 1986, and "Parsimonious Modeling of Yield Curves for U.S. Treasury Bills," NBER Working Paper No. 1594, March 1985.

<sup>3</sup>J. Y. Campbell, "A Defense of Traditional Hypotheses about the Term Structure of Interest Rates," NBER Reprint No. 695, March 1986; J. Y. Campbell and R. H. Clarida, "A Term Structure of Euro-market Interest Rates: An Empirical Investigation," NBER Working Paper No. 1946, June 1986; T. Ito, "Use of (Time-Domain) Vector Autoregressions to Test Uncovered Interest Parity," NBER Working Paper No. 1493, November 1984; T. A. Marsh, "Asset Pricing Model Specification and the Term Structure Evidence," NBER Working Paper No. 1612, April 1985; and A. Melino, "The Term Structure of Interest Rates: Evidence and Theory," NBER Working Paper No. 1828, February 1986.

<sup>4</sup>J. A. Wilcox, "Short-Term Movements of Long-Term Real Interest Rates: Evidence from the U.K. Indexed Bond Market," NBER Working Paper No. 1543, January 1985; A. Kane and L. Rosenthal, "Efficient Inflation Forecasts: An International Comparison," NBER Working Paper No. 1542, January 1985; N. G. Mankiw and L. H. Summers, "Are Tax Cuts Really Expansionary?" NBER Working Paper No. 1443, September 1984; and R. B. Barsky and L. H. Summers, "Gibson's Paradox and the Gold Standard," NBER Working Paper No. 1680, August 1985.

<sup>5</sup>J. M. Poterba, "Explaining the Yield Spread between Taxable and Tax-Exempt Bonds: The Role of Expected Tax Policy," NBER Reprint No. 746, August 1986; J. Peek and J. A. Wilcox, "Tax Rates and Interest Rates on Tax-Exempt Securities," NBER Reprint No. 709, May 1986.

to personal taxes, even in the market for short-term securities.

**Interest Rates and Monetary Policy.** Finally, the events of recent years have heightened interest in a further factor plausibly affecting interest rates: monetary policy. John Huizinga, Frederic Mishkin, James Pesando, Gregory Mankiw, Jeffrey Miron, Carl Walsh, Vance Roley, and Ito have investigated this aspect of interest rate determination.<sup>6</sup> Huizinga and Mishkin documented a relationship between Federal Reserve policy changes in October 1979 (emphasizing monetary aggregate targets) and in October 1982 (deemphasizing them) and changes in the apparent process followed through time by real interest rates. They argued that these policy changes were in part responsible for the extraordinarily high level of real interest rates experienced in the United States during the 1980s. Similarly, Pesando found that Canadian interest rates had decreased in volatility as had U.S. rates after October 1979, and that this increased volatility was mostly unpredictable. Mankiw and Miron placed the focus on these most recent Federal Reserve actions in a broader historical perspective by showing not only that the original introduction of the Federal Reserve System in 1914 significantly changed short-long interest rate relationships but also that the resulting changes were consistent with a monetary policy committed to stabilizing interest rates.

One specific line of interest rate research that has been developed primarily by members of the program in recent years asks how monetary policy affects interest rates by studying how markets respond to the "news" contained in specific announcements—for example, the release of data on money growth. The work done on interest rates and monetary policy during the past two years by several of the program's members has continued to exploit this window on market behavior. Walsh showed that the manner in which interest rates respond to money stock announcements depends not only on the relative magnitude of nominal and real economic disturbances but also on the central bank's policy and the credibility of that policy. Huizinga found signif-

icant changes in the response of interest rates to money announcements associated with the Federal Reserve policy changes in October 1979 and October 1982. Similarly, Roley found significant changes in the response patterns associated with these two policy actions as well as with the adoption of (almost) contemporaneous reserve requirements in February 1984. In another paper, Roley extended this analysis to international financial markets by examining the change in response to U.S. money announcements, by yen-denominated asset yields in Tokyo and the yen/dollar exchange rate, associated with specific changes in U.S. monetary policy. In addition, in joint work, Ito and Roley found that announcements of U.S. money data systematically affected the yen/dollar exchange rate while other kinds of announcements did not.

## Equity Prices

In parallel with the focus on the determination of interest rates, questions about equity prices have also figured prominently in the research carried out during the past two years by members of the financial markets and monetary economics program. At the most basic level, Shiller and Herschel Grossman have done new—and in part conflicting—research on whether equity prices are too volatile to be consistent with fundamental valuations determined by rationally expected streams of future dividends.<sup>7</sup> In two papers based on a survey of institutional investors, Shiller argued that investors' behavior followed patterns of interaction capable of producing price movements unrelated to fundamental determinants of value. By contrast, in a series of four papers analyzing the possibility of speculative "bubbles" in asset pricing (including not just equities but also such assets as money and foreign exchange), Grossman first emphasized the restrictive conditions necessary for such bubbles to exist and then went on to argue, on the basis of empirical evidence, that there are no such bubbles in equity prices. Clearly, the debate over the role of fundamentals versus other factors in equity pricing is likely to continue.

The role of risk in affecting equity prices is no less important than that in affecting interest rates. Robert Pindyck, Patric Hendershott, Poterba, Summers, Bruce Lehmann, Sanford Grossman, Melino, Shiller, Mankiw, and Campbell have all done new research bearing on

<sup>6</sup>J. Huizinga and F. S. Mishkin, "Monetary Policy Regime Shifts and the Unusual Behavior of Real Interest Rates," NBER Reprint No. 770, October 1986; J. E. Pesando and A. Plourde, "The October 1979 Change in the Monetary Exchange Regime: Its Impact on the 'Forecastability' of Interest Rates," NBER Working Paper No. 1874, March 1986; N. G. Mankiw and J. A. Miron, "The Changing Behavior of the Term Structure of Interest Rates," NBER Reprint No. 734, July 1986; C. E. Walsh, "Monetary Information and Interest Rates," NBER Working Paper No. 1589, March 1985; J. Huizinga and L. Leiderman, "Interest Rates, Money Supply Announcements, and Monetary Base Announcements," NBER Working Paper No. 1705, September 1985; V. V. Roley, "The Response of Interest Rates to Money Announcements under Alternative Operating Procedures and Reserve Retirement Systems," NBER Working Paper No. 1812, January 1986, and "U.S. Monetary Policy Regimes and U.S.-Japan Financial Relationships," NBER Working Paper No. 1858, March 1986; and T. Ito and V. V. Roley, "News from the United States and Japan: Which Moves the Yen/Dollar Exchange Rate?" NBER Working Paper No. 1853, March 1986.

<sup>7</sup>R. J. Shiller and J. Pound, "Survey Evidence on Diffusion of Interest among Institutional Investors," NBER Working Paper No. 1851, March 1986; J. Pound and R. J. Shiller, "Speculative Behavior of Institutional Investors," NBER Working Paper No. 1964, June 1986; and B. T. Diba and H. I. Grossman, "Rational Bubbles in Stock Prices?" NBER Working Paper No. 1779, December 1985, "On the Inception of Rational Bubbles in Stock Prices," NBER Working Paper No. 1990, July 1986, "The Impossibility of Rational Bubbles," NBER Working Paper No. 1615, May 1985, and "Rational Inflationary Bubbles," NBER Working Paper No. 2004, August 1986.

this issue.<sup>8</sup> Pindyck found a significant role for the variance of returns (which has increased in recent years) in explaining the level of returns over time in the U.S. equity market. Similarly, Hendershott found evidence linking the decline in equity prices, beginning in the late 1960s, to the increased volatility of relative prices in the economy's nonfinancial markets. By contrast, Poterba and Summers argued that the volatility of equity returns is insufficiently persistent to warrant explaining the poor performance of stock prices since 1970 on this basis.

In a series of papers based on prices of individual securities, Lehmann also found an important role for risk, measured in a variety of ways. Grossman, Melino, and Shiller highlighted the role of risk in affecting equity prices in the aggregate, measuring risk by the relationship between equity returns and aggregate consumption. In contrast to their work, however, Mankiw argued that, because of the likely concentration of the effect of economic shocks, aggregate data are insufficient to measure the role of risk in equity pricing. Finally, Campbell's work focused on the relationship between risk premiums in the returns on equities and bonds, respectively.

### Implications for Nonfinancial Economic Activity

What happens in financial markets merits study by economists not just because it is interesting in itself (which it certainly is) but also—and perhaps even more importantly—because financial market phenomena also affect nonfinancial economic activity. It is not surprising, therefore, that aspects of economic behavior beyond the financial markets also tend to attract strong interest from members of the financial markets and monetary economics program. The past two years have been no exception.<sup>9</sup>

<sup>8</sup>R. S. Pindyck, "Risk Aversion and Determinants of Stock Market Behavior," NBER Working Paper No. 1921, May 1986; P. J. Elmer and P. H. Hendershott, "Relative Factor Price Changes and Equity Prices," NBER Working Paper No. 1449, September 1984; J. M. Poterba and L. H. Summers, "The Persistence of Volatility and Stock Market Fluctuations," NBER Working Paper No. 1462, September 1984; B. N. Lehmann and D. M. Modest, "The Empirical Foundations of the Arbitrage Pricing Theory I: The Empirical Tests," NBER Working Paper No. 1725, October 1985, and "The Empirical Foundations of the Arbitrage Pricing Theory II: The Optimal Construction of Basis Portfolios," NBER Working Paper No. 1726, October 1985; B. N. Lehmann, "Residual Risk Revisited," NBER Working Paper No. 1908, April 1986; S. J. Grossman, A. Melino, and R. J. Shiller, "Estimating the Continuous-Time, Consumption-Based Asset Pricing Model," NBER Working Paper No. 1643, June 1985; N. G. Mankiw, "The Equity Premium and the Concentration of Aggregate Shocks," NBER Working Paper No. 1788, January 1986; and J. Y. Campbell, "Bond and Stock Returns in a Simple Exchange Model," NBER Working Paper No. 1509, November 1984, and "Stock Returns and the Term Structure," NBER Working Paper No. 1626, June 1985.

<sup>9</sup>Research in the Bureau's Programs in Economic Fluctuations and Taxation has also dealt with several of the same issues.

*Money and Income.* Sanford Grossman, Walsh, Ben Bernanke, and I have done research on the relationship between money and economic activity.<sup>10</sup> Grossman analyzed the relationship that would follow from the use of money to economize on transactions costs and showed that, even if all goods markets cleared instantaneously, the presence of transactions costs would cause delayed responses of nominal variables to monetary changes and hence real effects because of monetary policy. Walsh analyzed this relationship in light of potential confusions between inside money (deposits) and outside money (the monetary base). He showed that, in the presence of incomplete information to distinguish shocks to either one, monetary changes again have real effects. Bernanke argued on empirical grounds, however, that the money-income correlation observed in the U.S. data was probably caused either by the role of credit in imperfect markets or by the passive response of money to economic fluctuations, rather than to any more directly causal role of money per se in affecting income. Similarly, I showed empirically that the money-income relationship has not been very regular over the history of U.S. business cycles and, moreover, that the analogous relationships of income to credit and to interest have been approximately comparable.

*Price Flexibility and Economic Stability.* A related question that several members of the program have addressed—including Summers, Glenn Hubbard, and Roger Waud—is the relationship between price flexibility and the stability of nonfinancial economic activity.<sup>11</sup> In two papers, Summers argued first that price inflexibility might be stabilizing on net, and second that the decline in flexibility of prices in the United States since World War II had been a major source of the observed decline in cyclical variability during this period. Similarly, Hubbard argued that, in large part because of credit rationing effects, price declines are likely to be destabilizing for economic activity. In another paper, Hubbard analyzed the logically prior question of what determines the economy's degree of price flexibility,

<sup>10</sup>S. J. Grossman, "Monetary Dynamics with Proportional Transaction Costs and Fixed Payment Periods," NBER Working Paper No. 1663, July 1985; P. R. Hartley and C. E. Walsh, "Inside Money and Monetary Neutrality," NBER Working Paper No. 1890, April 1986; B. S. Bernanke, "Alternative Explanations of the Money-Income Correlation," NBER Working Paper No. 1842, February 1986; and B. M. Friedman, "Money, Credit, and Interest Rates in the Business Cycle," NBER Working Paper No. 1482, October 1984.

<sup>11</sup>J. B. DeLong and L. H. Summers, "The Changing Cyclical Variability of Economic Activity in the United States," NBER Working Paper No. 1450, September 1984, and "Is Increased Price Flexibility Stabilizing?" NBER Working Paper No. 1686, August 1985; C. W. Calomiris and R. G. Hubbard, "Price Flexibility, Credit Rationing, and Economic Fluctuations: Evidence from the United States, 1879-1914," NBER Working Paper No. 1767, November 1985; R. G. Hubbard and R. J. Weiner, "Nominal Contracting and Price Flexibility in Product Markets," NBER Working Paper No. 1738, October 1985; and R. T. Froyen and R. N. Waud, "An Examination of Aggregate Price Uncertainty in Four Countries and Some Implications for Real Output," NBER Working Paper No. 1460, September 1984.

pointing to the relative importance of demand shocks relative to supply shocks as increasing the likelihood of nominal contracts with rigid prices. Waud used empirical data for the United States, the United Kingdom, Canada, and Germany to show that greater price variability increases price uncertainty, and that greater price uncertainty in turn raises unemployment and lowers output levels.

**Consumption Behavior.** Walsh, Miron, Nelson, and I have all done new research on consumption behavior, in each case examining some aspect of the familiar life-cycle hypothesis.<sup>12</sup> Walsh showed that the usual finding that consumption is more sensitive to current income than the life-cycle model implies can be explained by effects of borrowing constraints, in conjunction with persistent shocks to individuals' incomes. By contrast, Miron argued that seasonal fluctuations in consumption purchases are an adequate explanation. Nelson analyzed the differences in specification of the relevant theory used by several previous researchers, showing how these differences can account for their differing results. In two papers, I used data on the pricing of individual life annuities in the United States to show under what conditions the failure of most individuals to buy such annuities could be taken as evidence indicating the presence of a bequest motive.

**Investment Behavior.** In two papers, Pindyck investigated the implications for firms' investment behavior of the fact that new investment takes time to put in place, and then is often irreversible.<sup>13</sup> In one paper, Pindyck showed that, because of the time sequencing, moderate levels of uncertainty over the future value of completed projects can lead firms to overinvest if they apply simple net-present-value rules, while increasing uncertainty will depress investment spending. In another paper, however, Pindyck showed that the irreversibility of investment makes the firms' optimal capacity smaller than it otherwise would be.

## Monetary and Fiscal Policies

Traditionally in economics, one of the central motivations for investigating either financial or nonfinancial aspects of economic activity is the desire to deepen the understanding of how public policy affects the

economy, for good or ill. Many of the more specific questions on which members of the program have done research during the past two years—including such financial phenomena as interest rates and equity prices, as well as such aspects of nonfinancial behavior as consumption, the money-income relationship, and the effects of price flexibility—bear potentially important implications for the conduct of macroeconomic policy. At the same time, many members of the program have also done research bearing on key issues of monetary and fiscal policy in an even more direct way.

**Budget Deficits and "Crowding Out."** Martin Feldstein, Poterba, Summers, Mankiw, and I have all done research on the question, which has attracted particular attention as the U.S. government's budget deficit has steadily widened in the 1980s, of whether government deficits "crowd out" economic activity in the private sector.<sup>14</sup> Feldstein found evidence indicating that projected future budget deficits raise long-term interest rates by a large amount. In one paper, I found that short-term debt, long-term debt, and equities are sufficiently imperfect substitutes in U.S. investors' portfolios that the increase in government debt required to finance large deficits can have major effects on the structure of relative yields on these assets. In another paper, I found that government deficits crowd out both domestic capital formation and net exports, with little if any offset from additional private saving. By contrast, Poterba and Summers argued that, in practice, the major periods of accumulation of U.S. government debt relative to income typically have been reversed sufficiently rapidly to have had little impact on overall national saving. Similarly, Mankiw pointed out conditions under which increases in government spending can lower real interest rates; he suggested that this finding might explain the observed tendency toward low real interest rates during wartime.

**Targets for Monetary Policy.** Walsh, McCallum, Michael Bordo, Anna Schwartz, and I did new research on the usefulness of various targets as a guideline for monetary policy.<sup>15</sup> I analyzed the information value contained in several different potential policy targets and found little evidence to warrant singling out any specific financial

<sup>12</sup>C. E. Walsh, "Borrowing Restrictions and Wealth Constraints: Implications for Aggregate Consumption," NBER Working Paper No. 1629, June 1985; J. A. Miron, "Seasonal Fluctuations and the Life Cycle-Permanent Income Model of Consumption," NBER Working Paper No. 1845, February 1986; C. R. Nelson, "A Reappraisal of Recent Tests of the Permanent Income Hypothesis," NBER Working Paper No. 1687, August 1985; and B. M. Friedman and M. Warshawsky, "The Cost of Annuities: Implications for Saving Behavior and Bequests," NBER Working Paper No. 1682, August 1985, and "Annuity Prices and Saving Behavior in the United States," NBER Working Paper No. 1683, August 1985.

<sup>13</sup>S. Majd and R. S. Pindyck, "Time to Build, Option Value, and Investment Decisions," NBER Working Paper No. 1654, June 1985; and R. S. Pindyck, "Irreversible Investment, Capacity Choice, and the Value of the Firm," NBER Working Paper No. 1980, July 1986.

<sup>14</sup>M. Feldstein, "Budget Deficits, Tax Rules, and Real Interest Rates," NBER Working Paper No. 1970, July 1986; B. M. Friedman, "Crowding Out or Crowding In? Evidence on Debt-Equity Substitutability," NBER Working Paper No. 1565, February 1985, and "Implications of the U.S. Net Capital Inflow," NBER Working Paper No. 1804, January 1986; J. M. Poterba and L. H. Summers, "Finite Lifetimes and the Crowding-Out Effects of Government Deficits," NBER Working Paper No. 1955, June 1986; and N. G. Mankiw, "Government Purchases and Real Interest Rates," NBER Working Paper No. 2009, August 1986.

<sup>15</sup>B. M. Friedman, "The Value of Intermediate Targets in Implementing Monetary Policy," NBER Reprint No. 595, April 1985; P. Jenkins and C. E. Walsh, "Real Interest Rates, Credit Markets, and Economic Stabilization," NBER Working Paper No. 1575, March 1985; B. T. McCallum, "On the Consequences and Criticisms of Monetary Targeting," NBER Reprint No. 683, February 1986; and M. D. Bordo, E. U. Choudhri, and A. J. Schwartz, "Money Growth Variability and Money Supply Interdependence under Interest Rate Control: Some Evidence from Canada," NBER Working Paper No. 1480, October 1984.

variable—and, in particular, not the M1 money stock—as the central focus of policy. Walsh developed a framework facilitating the evaluation of either a credit aggregate or a real interest rate as potential policy targets. McCallum brought together and evaluated the major criticisms of the use of monetary targets, including the questionable feasibility of monetary control, induced volatility of market interest rates, difficulties arising from technical change and deregulation, and strategic issues such as rules versus discretion and the appropriate extent of policy activism. Bordo and Schwartz studied the difficulties experienced in recent years in achieving money growth stability in Canada and argued that the problems had arisen from the Canadian central bank's use of an interest rate control mechanism.

*Other Monetary Policy Issues.* McCallum, Herschel Grossman, and Jess Yawitz also investigated other questions about monetary policy.<sup>16</sup> McCallum argued that, under some conditions, the maintained inflation rate that is optimal from the perspective of promoting economic growth depends crucially on the role played in the economy by an asset that is productive but not itself reproducible (for example, land). Grossman also analyzed monetary policy and inflation, focusing on conditions under which the government would choose to rely on the “inflation tax” as a means of finance. In another paper, Grossman argued that the shift that took place around 1972 in the correlation between current money growth and past inflation in the United States reflected a change in the dominant source of shocks affecting the U.S. economy, rather than a change in the objectives pursued by U.S. monetary policymakers. Yawitz analyzed the observed effect of announced changes in the Federal Reserve's discount rate on market interest rates, and found that purely “technical” discount rate changes do not significantly affect market rates while “nontechnical” changes do.

## Corporate Finance and Capital Formation

The largest research project undertaken within the program during the 1980s has been the study of “The Changing Roles of Debt and Equity in Financing U.S. Capital Formation,” sponsored by the American Council of Life Insurance. The first studies completed under this project were published individually and summarized in a 1982 NBER volume.<sup>17</sup> Ten further studies, focused

<sup>16</sup>B. T. McCallum, “The Optimal Inflation Rate in an Overlapping-Generations Economy with Land,” NBER Working Paper No. 1892, April 1986; H. I. Grossman and J. B. Van Huyck, “Seigniorage, Inflation, and Reputation,” NBER Working Paper No. 1505, November 1984; S. Green and H. I. Grossman, “The Illusion of Stabilization Policy?” NBER Working Paper No. 1889, April 1986; and M. Smirlock and J. B. Yawitz, “Asset Returns, Discount Rate Changes, and Market Efficiency,” NBER Working Paper No. 1530, December 1984.

<sup>17</sup>B. M. Friedman, ed., *The Changing Role of Debt and Equity in Financing U.S. Capital Formation*, Chicago: University of Chicago Press, 1982.

in particular on the financial side of capital formation undertaken by the U.S. corporate business sector, were published in an NBER volume in 1985.<sup>18</sup> In addition, a further NBER volume published in 1986 has now made available to a nontechnical readership the principal findings of six of these ten studies.<sup>19</sup>

## Financial Behavior and Financial Markets

In addition to the debt-equity project, with its emphasis on corporate financing and corporate capital formation, members of the program have done research on a very broad range of specific topics related to financial behavior and financial markets.

*Asset Demand Behavior.* Roley, Stanley Fischer, Poterba, Julio Rotemberg, and I have all studied aspects of the implications of risk and other factors in determining investors' portfolio behavior.<sup>20</sup> In one paper, I showed that debt and equity securities in the United States are sufficiently imperfect substitutes that investors' resulting desire to allocate their portfolios in relatively inflexible proportions could plausibly explain the historical stability of the U.S. economy's aggregate ratio of debt to income. In another paper, Roley and I examined the implications of asset risk and found that the form of asset demand relationship that is simply assumed in much financial analysis is inconsistent with the observed behavior of both individual and institutional investors in the United States. Fischer found that the familiar principle of investing portfolios with less diversification as the holding period lengthens is not optimal if asset returns exhibit persistence over time. Poterba and Rotemberg experimented with a formulation of investors' asset demands allowing for a direct liquidity benefit to holders of money and other specific assets. In another paper, Roley evaluated a variety of approaches proposed for explaining the apparent unpredictability of U.S. money demand since the early 1970s and found evidence inconsistent with conventional specifications.

*Pensions and Insurance.* Zvi Bodie, Alan Marcus, Robert Merton, Alan Auerbach, and Laurence Kotlikoff

<sup>18</sup>B. M. Friedman, ed., *Corporate Capital Structures in the United States*, Chicago: University of Chicago Press, 1985. For summaries of these papers, see the Program Report in the Summer 1984 NBER Reporter.

<sup>19</sup>B. M. Friedman, ed., *Financing Corporate Capital Formation*, Chicago: University of Chicago Press, 1986. The six papers included in this volume are by Robert Taggart; Hendershott; Zvi Bodie, Alex Kane, and Robert McDonald; Scott Mason; Alan Auerbach; and myself.

<sup>20</sup>B. M. Friedman, “Portfolio Choice and the Debt-to-Income Relationship,” NBER Reprint No. 628, July 1985; B. M. Friedman and V. V. Roley, “Aspects of Investor Behavior under Risk,” NBER Working Paper No. 1611, April 1985; S. Fischer and G. Pennacchi, “Serial Correlation of Asset Returns and Optimal Portfolios for the Long and Short Term,” NBER Working Paper No. 1625, June 1985; V. V. Roley, “Money Demand Predictability,” NBER Reprint No. 688, March 1986; and J. M. Poterba and J. J. Rotemberg, “Money in the Utility Function: An Empirical Implementation,” NBER Working Paper No. 1796, January 1986.



all did research on pension and insurance markets.<sup>21</sup> Bodie, Marcus, and Merton analyzed the different forms of risk inherent in defined-benefit versus defined-contribution pension plans and argued that neither form of plan dominated the other in all circumstances. Pesando used the examples of five Canadian pension plans to show that it can be seriously misleading to analyze pensions as if the worker's cash wage plus accruing pension benefits equaled the worker's marginal product in every time period, rather than on average over a long period of time. Auerbach and Kotlikoff examined data on insurance coverage among the elderly population in the United States and found that combined public and private life insurance is inadequate for a significant minority of households, and that this inadequacy may help to explain the observed high incidence of poverty especially among elderly widows.

**Mortgage Markets.** Hendershott and Edward Kane both did research on the rapid evolution in recent years of U.S. mortgage markets and mortgage securities.<sup>22</sup> In a series of papers, Hendershott analyzed the pricing of the increasingly popular adjustable-rate mortgages, including such specific features as rate effects caused by caps, prepayment risk, and default risk. In another paper, Hendershott developed a framework for examining the impact of seller financing of house sales. Kane studied the connection between government subsidies to house ownership and recent technical changes in mortgage financing, and argued that technical change is reducing the controllability of aggregate subsidies associated with long-standing patterns of providing implicit and explicit federal mortgage guarantees.

**Taxes.** Stewart Myers, Robert Taggart, and Hendershott explored the effects of taxes and tax changes on financial behavior and financial markets.<sup>23</sup> Myers analyzed the implications of asymmetries in the taxation

of operating gains and losses at the corporate level, including provisions for carrying tax losses forward and backward, and concluded that asymmetric taxation can significantly affect the aftertax net present value of corporate investment opportunities. Taggart examined the implication of taxes for the ownership structure of productive assets, focusing especially on the fact that income earned by corporations (in contrast to partnerships) is subject to taxation at both corporate and investor levels. He argued that such tax differences account for familiar patterns of ownership and financing as well as for aspects of such transactions as mergers and spin-offs of corporate assets to partnerships and royalty trusts. Hendershott compared the likely impacts of four different tax reform proposals for taxable and tax-exempt interest rates, borrowing flows, and securities prices, finding significant potential effects that differed in important ways from one proposal to another.

**Securities Markets.** Lehmann, Alex Kane, and Marcus investigated several specific questions about the behavior of investors in securities markets.<sup>24</sup> Lehmann found that evaluations of mutual fund performance hinge critically on the particular benchmark chosen for purposes of the comparison. He showed that there is little similarity in either the absolute or the relative rankings of mutual funds obtained from alternative benchmarks. In one paper, Kane and Marcus developed a framework for evaluating the contribution of security analysis to active portfolio management. They found that the value of security analysis depends critically on such factors as the relevant forecast horizon and the ability to engage in short sales. In another paper, Kane and Marcus developed a model for evaluating the "wild card" option in the standard Treasury bill futures contract and for determining when it is optimal to exercise the option.

**Other Issues.** Finally, Herschel Grossman, Mankiw, Bordo, McCallum, Mishkin, and I all completed research on other aspects of financial behavior and financial markets.<sup>25</sup> Grossman developed a framework for interpreting sovereign debts as contingent claims that shift

<sup>21</sup>Z. Bodie, A. J. Marcus, and R. C. Merton, "Defined-Benefit versus Defined-Contribution Pension Plans: What Are the Real Trade-Offs?" NBER Working Paper No. 1719, October 1985; J. E. Pesando, "Discontinuities in Pension Benefit Formulas and the Spot Model of the Labor Market: Implications for Financial Economists," NBER Working Paper No. 1795, January 1986; and A. J. Auerbach and L. J. Kotlikoff, "Life Insurance for the Elderly: Adequacy and Determinants," NBER Working Paper No. 1737, October 1985.

<sup>22</sup>S. A. Buser, P. H. Hendershott, and A. B. Sanders, "Pricing Rate Caps on Default-Free, Adjustable-Rate Mortgages," NBER Working Paper No. 1525, December 1984; P. H. Hendershott, "Pricing Adjustable-Rate Mortgages," NBER Reprint No. 654, October 1985, and "Mortgage Pricing: What Have We Learned So Far?" NBER Working Paper No. 1959, June 1986; D. R. Haurin and P. H. Hendershott, "Affordability and the Value of Seller Financing," NBER Working Paper No. 1695, September 1985; and E. J. Kane, "Change and Progress in Contemporary Mortgage Markets," NBER Working Paper No. 1478, October 1984.

<sup>23</sup>S. Majd and S. C. Myers, "Valuing the Government's Tax Claim on Risky Corporate Assets," NBER Working Paper No. 1553, February 1985; E. P. Jones and R. A. Taggart, Jr., "Taxes and Ownership Structure: Corporations, Partnerships, and Royalty Trusts," NBER Working Paper No. 1441, September 1984; and P. H. Hendershott, "Tax Reform and Financial Markets," NBER Working Paper No. 1707, September 1985.

<sup>24</sup>B. N. Lehmann and D. M. Modest, "Mutual Fund Performance Evaluation: A Comparison of Benchmarks and Benchmark Comparisons," NBER Working Paper No. 1721, October 1985; A. Kane and A. J. Marcus, "The Valuation of Security Analysis," NBER Working Paper No. 1958, June 1986, and "Valuation and Optimal Exercise of the Wild Card Option in the Treasury Bond Futures Market," NBER Reprint No. 751, August 1986.

<sup>25</sup>H. I. Grossman and J. B. Van Huyck, "Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation," NBER Working Paper No. 1673, July 1985; N. G. Mankiw, "The Allocation of Credit and Financial Collapse," NBER Working Paper No. 1786, January 1986; M. D. Bordo, "Explorations in Monetary History: A Survey of the Literature," NBER Working Paper No. 1821, January 1986; B. M. Friedman, "Financial Intermediation in the United States," NBER Reprint No. 623, July 1985; B. T. McCallum, "Bank Deregulation, Accounting Systems of Exchange, and the Unit of Account: A Critical Review," NBER Reprint No. 704, April 1986; and F. S. Mishkin, "U.S. Macroeconomic Policy and Performance in the 1980s: An Overview," NBER Working Paper No. 1929, May 1986.

risks between borrowers and lenders and analyzed the market equilibrium that would result from borrowers' awareness of how their actions would affect their future creditworthiness. Mankiw exploited the typical information asymmetry between borrowers and lenders to argue that the allocation of credit is likely to be inefficient, hence subject to improvement by government intervention, and that only small changes in interest rates on default-free debts can cause large changes in the allocation of credit and in the resulting inefficiency of market equilibrium. Bordo surveyed recent contributions to economic history in the specific context of work on the role of money. I placed in historical perspective the changes that have taken place in the structure of financial intermediation in the United States since World War II. McCallum surveyed recent proposals for fundamental deregulation of banking industry functions, including proposals that would lead to the predominance of private media of exchange. Mishkin provided an overview of U.S. monetary and fiscal policies in the 1980s, and of the interaction between these policies and the nation's economic performance.

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## Research Summaries

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### Research Conference Held in October

The following three articles summarize presentations made at NBER's Annual Research Conference in New York on October 6.

#### *Annual Research Conference—1:* **The Lesson of Experience in Reducing Inflation**

Stanley Fischer

The German hyperinflation of 1922-3 is the best known of the classic hyperinflations of the 1920s. Austria, Hungary, Poland, and the Soviet Union also suffered from hyperinflation in the aftermath of World War I; and Greece and Hungary (again) experienced hyperinflation during and after World War II. Data on these hyperinflations, taken from a famous paper by Phillip Cagan, are presented in Table 1.

**Table 1. The Classic Hyperinflations**

Country	Period	Average Rate of Inflation*	Average Rate of Growth of Currency*
Austria	10/21- 8/22	47.1	30.9
Germany	8/22-11/23	322.0	314.0
Greece	11/43-11/44	365.0	220.0
Hungary	3/23- 2/24	46.0	32.7
Hungary	8/45- 7/46	19,800.0	12,200.0
Poland	1/23- 1/24	81.4	72.2
Russia	12/21- 1/24	57.0	49.3

\* Percent per month.

Source: Phillip Cagan, "The Monetary Dynamics of Hyperinflation," in *Studies in the Quantity Theory of Money*, M. Friedman, ed., Chicago: University of Chicago Press, 1956.

Cagan defined hyperinflation as starting when the inflation rate first exceeded 50 percent per month: average rates of inflation in some of those episodes were much higher, with the second Hungarian hyperinflation holding the record. The annual inflation rate corresponding to 50 percent per month is 12,800 percent, meaning that currency would lose more than 99 percent of its purchasing power within a year.

The classic hyperinflations took place in the aftermath of wars and the breakup of empires. The post-World War II period has seen a new phenomenon: persistent high inflation, for example in excess of 100 percent per year, for years and even a decade. Persistent high inflations have taken place in some Latin American countries and in Israel; several countries have experienced annual inflation rates of more than 100 percent in episodes lasting more than a year. Except for Bolivia in 1985, however, none of these countries came close to matching the rates of inflation attained in the classic hyperinflations.

In joint research, NBER Research Associates Michael Bruno of Hebrew University, Rudiger Dornbusch of MIT, and I have set out to compare the classic and modern high inflations, seeking to answer the questions of why the inflations begin, how they are sustained, and how (sometimes) they are ended.

Everyone knows that inflation is caused by rapid money growth. It is certainly true that money growth is high in all the inflationary countries. Because inflation itself causes a flight out of money, the average inflation rate in the high-inflation episodes typically exceeds the average growth rate of money, as can be seen in Table 1 and also in Table 2, which presents data from three modern high-inflation countries.

But what causes high money growth? Typically it is a large government budget deficit. Governments are printing money to cover high spending or revenue shortfalls. In the classic hyperinflations the budget deficits

**Table 2. Prestabilization Data, Modern Cases**

Country	Period	Average Inflation Rate (percent per annum)	Inflation Rate In Year of Prestabilizing	Average M1 Growth	Budget Deficit/GNP (percent)*
Argentina	1975-1985	235	672	215	11
Brazil	1981-1985	172	227	151	26 (3)
Israel	1980-1985	195	305	162	13

\* Data for the year before stabilization: 26 percent was total Brazilian deficit/GNP; 3 percent was deficit excluding inflation component of interest.

Sources: IMF, *Financial Statistics*; Dornbusch and Simonsen, "Inflation Stabilization with Incomes Policy Support," Bank of Israel, September 1986, and forthcoming as an NBER Working Paper.

originated in wars and the breakdown of the fiscal system. In the modern high inflations, fiscal problems resulted from wars or political weakness.

Once the inflation starts, inflation-perpetuating mechanisms come into operation: (1) The budget deficit increases as high inflation reduces the efficiency of the tax system, with delays in tax collection reducing the real value of the government's receipts.<sup>1</sup> (2) As the inflation proceeds, money holders shift toward real assets, requiring more money growth to generate a given amount of revenue. (3) Indexation of financial assets, to the price level and the exchange rate, further reduce the role of the domestic currency. Wages and prices become increasingly flexible as a result of indexation. Indexation lags shorten as the inflation increases, causing the economy to become increasingly sensitive to inflationary shocks. (4) At high rates of inflation, the exchange rate has to be flexible and eventually becomes the key price in the economy. Foreign currency becomes used as a unit of account, as a store of value, and to a limited extent, as the medium of exchange.

Of course, it is not inevitable that a country with a budget deficit end up with a hyperinflation, or persistent three-digit (per year) inflation. Most countries that experienced inflation of 20-50 percent per year succeeded in backing away from the brink through a serious concerted attack on inflation, or through the steady application of restrictive policy.

<sup>1</sup>A related effect that seems to raise the budget deficit arises from inflation-caused increases in nominal interest rates. This effect may be very large. For instance, if the national debt is 20 percent of GNP (a low figure) and the inflation rate 100 percent, then if the interest rate rises one-for-one with inflation, the budget deficit will appear to be 20 percent of GNP larger, merely as a result of the inflation. However, the component of interest that compensates for inflation should not be included in the deficit: assuming that portfolio holders want to maintain the real value of their holdings of government debt, these interest payments are in effect automatically reinvested in government debt. The effects of inflation-caused increases in nominal interest rates on measured budget deficits have been a source of disagreement between the IMF and some developing countries.

The hyperinflating countries all had to stabilize eventually, as it became politically and economically impossible to live with the inflation. Each stabilization was preceded by unsuccessful efforts. Often these took the form of an attempt to stabilize the exchange rate, in the belief that the inflation was largely driven by expectations and that it would stop only if some point of stability could be provided around which expectations of stability could coalesce. After the failures, a comprehensive plan was put into effect involving fiscal reform; currency reform—the introduction of a new currency, with the exchange rate fixed against gold or a foreign currency; or some restrictions on money growth, perhaps that the money stock could be increased only if backed by gold or foreign exchange.

In some cases it is not obvious why one stabilization program succeeded where a previous one had failed: self-fulfilling prophecies are a distinct possibility, because confidence that the stabilization would succeed was often one element in success. The stabilizations were usually followed by some increase in unemployment, although because the economy was coming out of a period of extreme disorganization, recovery was typically quite rapid.

Also typical, and very important, are high real interest rates and rapid money growth. At the end of a hyperinflation people want to restore the purchasing power of their money holdings, which may have fallen to a small fraction of the normal value. For instance, in the German hyperinflation, the purchasing power of money at the time of stabilization was about 4 percent of its normal value, meaning that the money supply could be increased severalfold without causing inflation. If money growth is not fast enough to satisfy the increase in demand, interest rates will be high. Even so, there is a dilemma about the extent to which money should be allowed to grow: if confidence is adversely affected by high money growth because people believe that inevitably produces inflation, the success of the stabilization may require high real interest rates for some time. And

the high interest rates in turn may cause bankruptcies and unemployment.

After our research began, three major stabilization programs were undertaken in high-inflation countries: in Argentina and Israel in June 1985, and in Brazil in February 1986. (Bolivia also undertook a stabilization program, which we have not yet studied.) Paradoxically, it may be more difficult to stabilize a high-inflation economy, where the price system has not broken down entirely, than an economy suffering from hyperinflation.

The modern stabilizations share features with the classics: some fiscal reform, more marked in Argentina and Israel than in Brazil; in Argentina and Brazil, the introduction of new currencies; in all three cases, temporarily fixed exchange rates; in all three cases, rapid money growth; and in Argentina and Israel, but not Brazil, high real interest rates after the stabilization. They differ sharply from the classic stabilizations in that comprehensive wage and price controls were used in each country in an attempt to stop the inflation without creating unemployment. The theory was that it would be possible to move the economy directly to a low inflation equilibrium without having to use unemployment to force down the rate of wage increase, by fixing the exchange rate, wages, and prices while attending to the underlying fiscal imbalance.

It is too early to tell whether the modern stabilizations ultimately will succeed. Inflation and the budget deficit remain low in Israel more than a year after the start of the program; Argentina has seen a resurgence of inflation in recent months; and there are signs of excessive demand pressures in Brazil. But all three stabilization programs showed impressive early success, particularly in reducing inflation without creating a recession. Whether they can make the transition to stable low inflation without wage and price controls remains to be seen, and the reasons for success or failure may be a subject for future research.

*Annual Research Conference—II:*

## **Are Stock and Bond Prices Too Volatile?**

Robert J. Shiller

The day after a major movement in the stock or bond market, the news media inevitably carry a story of what happened. Sometimes they report that the market responded to news about the outlook for corporate profits. Other times they say that the market responded to suspicions that the Federal Reserve would tighten or loosen credit, or to indicators of the business cycle that suggest a coming boom or recession.

Readers naturally might wonder if such stories have any factual basis. Two questions of interpretation come to mind. First, were people actually thinking what was attributed to them by reporters? Second, was there in fact any rational basis for people to change the valuation of stocks or bonds for the reasons offered?

The first question of interpretation, it would seem, might be easily settled by a systematic poll of market participants conducted right after a big market change, while memories are still fresh. I have been unable to find any published scientific poll of this sort. So, I conducted such a poll after the major stock market drops of September 11 and 12, 1986, when the Dow Jones industrial index dropped a total of almost 121 points, or 6.4 percent, in two days. A few days later I sent out questionnaires to a random sample of 300 individuals throughout the United States: 175 institutional investors and 125 wealthy individual investors. I asked them to tell me "any reason to buy or sell you thought about *on those days*," and emphasized, "Please try hard to remember; don't give something you thought or talked about later." I received 113 responses: none mentioned any of the stories or rumors offered in the major newspapers for the market drop. In fact, no more than three responses seemed to refer to any new rumor or newsbreak in that week except the news of the market decline itself. If these investors were responding in large numbers to anything at all, it was the price drop itself. Of course, it is possible that my survey missed a class of investors who were moving the market then, and of course this evidence concerns only one drop in the market.

The second question—whether movements in stock or bond markets typically can be justified by economic fundamentals—may be more authoritatively answered, since we have a large amount of data on stock and bond prices and on other relevant economic variables. In 1979, I used interest rate data extending back to the 19th century to determine whether long-term bond yields could be explained in terms of conventional expectations theories of the term structure. According to these theories, long-term interest rates are a sort of moving average of expected future short-term rates, and moving averages tend to smooth out the series being averaged. Thus, expectations theories imply that long-term rates should not be too volatile. I concluded that the observed volatility of long-term rates is too high unless short-term rates are actually more variable than historical experience would suggest.<sup>1</sup>

In 1981, Stephen LeRoy and Richard Porter used U.S. data back to World War II to assess whether the volatility of stock prices could be justified by subsequent earnings movements. Along similar lines, I used U.S. data back to 1871 to determine whether the volatility of stock prices could be justified by subsequent dividend movements. The conclusion of both studies

<sup>1</sup>R. J. Shiller, "The Volatility of Long-Term Interest Rates and Expectations Models of the Term Structure," *Journal of Political Economy* 87 (December 1979), pp. 1190-1219.

was that stock prices are more volatile than can be justified by earnings or dividends unless earnings or dividends are in fact much more variable than their historical movements would suggest.<sup>2</sup>

Together, these results suggest that the answer to the second question is no: the economic factors that have been studied do not offer a rational basis for the magnitude of price movements typically observed in bonds and stocks. Thus, by changing investor optimism, fashions or fads may indeed move the stock market, as many analysts have claimed. But there are alternative explanations of these results.

For example, much discussion has focused on the possibility that the summary statistics used to measure the historical variability of short-term interest rates, earnings, or dividends may not be good guides to the potential variability of these factors.<sup>3</sup> If interest rates, earnings, or dividends show a lot of persistence through time—that is, if they are vulnerable to wide, slow swings that may not be seen even in century-long samples—then they may be misleading. One of the simplest ways to deal with the possibility of such persistence is to use year-to-year changes in interest rates or dividends, the spread between long-term interest rates, and the dividend-price ratio. All of these measures seem to show dramatically less persistence through time than the *levels* of interest rates, dividends, or prices. Therefore, the analysis can be recouched in terms of these variables.

Recent work suggests that the spread between long-term interest rates and short-term interest rates has not really shown excess volatility with regard to the expectations theory of the term structure. John Campbell and I found that the spread is not a bad forecaster of the weighted-average change in short-term rates over the life of the long-term bond. Thus, the expectations theory of the term structure may be true. Nonetheless, there is evidence of some short-run noise in long-term bond rates. Such noise adds a lot to the variance of short-term holding returns on long-term bonds even though it adds little to the variance of the spread between long-term and short-term interest rates.<sup>4</sup>

Using the Standard & Poors Composite Index for 1872–1986, Campbell and I also found that the dividend-price ratio correctly predicts certain future divi-

dend movements. However, this “prediction” is much less impressive evidence that stock prices behave properly than was the corresponding evidence for the expectations theory of long-term interest rates. That is, short-term movements in the dividend-price ratio predict short-term movements in dividends. However, the dividend-price ratio is worthless in predicting the *overall* course of dividends. Aggregate real dividends follow a rather choppy path through time, while stock prices are less choppy. Therefore, when dividends suddenly show a temporary runup, the dividend-price ratio will tend to be high. But many movements in the dividend-price ratio do not relate to future changes in dividends, so it is essentially useless as a forecaster of dividends.

Movements in the dividend-price ratio may also reflect the outlook for future real interest rates. When real interest rates are high, stock prices should be relatively heavily discounted and thus low. Therefore, the dividend-price ratio also should tend to be high. But we find that real interest rates have not helped to explain the dividend-price ratio. Nor did changes in real per capita consumption or in the variance (or uncertainty) of stock market returns help to explain movements in the dividend-price ratio.<sup>5</sup>

Our overall conclusion is that certain market movements can be rationally justified in terms of economic fundamentals. However, particularly for the stock market, most movements may well have nothing at all to do with such fundamentals.

<sup>5</sup>The results on the dividend-price ratio are in J. Y. Campbell and R. J. Shiller, “The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors,” presented at the NBER Economic Fluctuations meeting, Boston, October 1986.

<sup>2</sup>S. F. LeRoy and R. D. Porter, “The Present-Value Relation: Test Based on Variance Bounds,” *Econometrica* 49 (May 1981), pp. 555–574; and R. J. Shiller, “Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?” NBER Reprint No. 188, August 1981, and *American Economic Review* 71, 3 (June 1981), pp. 421–436.

<sup>3</sup>See, for example, M. A. Flavin, “Excess Volatility in the Financial Markets: A Reassessment of the Empirical Evidence,” *Journal of Political Economy* 91 (December 1983), pp. 929–956; and T. A. Marsh and R. C. Merton, “Dividend Variability and Variance Bounds Tests for the Rationality of Stock Market Volatility,” *American Economic Review* 76 (June 1986), pp. 483–498.

<sup>4</sup>J. Y. Campbell and R. J. Shiller, “Cointegration and Tests of Present-Value Models,” NBER Working Paper No. 1885, April 1986.

## Annual Research Conference—III: Assessing Japanese Competitiveness

Richard C. Marston

Recently, the misalignment of the dollar relative to the yen has obscured the effects of an even longer-term influence on the relative competitiveness of the two economies: higher productivity growth in Japan. Estimates of real exchange rates, which measure competitiveness only in terms of general price indexes, seriously underestimate the relative competitiveness of the Japanese economy.

For the past few decades, productivity growth has been much more rapid in Japan than in the United States. Ordinarily, such a gap in productivity growth would not affect real exchange rates, except that productivity

growth has been concentrated in the traded goods sectors of both economies. To reflect this productivity growth, the prices of traded goods must continually fall relative to the prices of nontraded goods (the latter consisting largely of services). Between 1973 and 1983, prices of traded goods fell relative to those of nontraded goods by 57 percent in Japan (compared with a decline of relative prices of 12 percent in the United States). Because of these internal price changes, Japanese general price indexes, which include nontraded goods as well as traded goods, give a distorted picture of the competitiveness of Japan's traded sector.

The magnitude of that distortion is surprisingly large. From 1973 to 1983, the first 11 years of floating exchange rates, the real exchange rate between the dollar and the yen based on the *consumer price index* (CPI) actually showed an improvement in U.S. competitiveness of 9 percent (measured as a trend). This improvement, if taken at face value, occurred despite a dramatic rise in the dollar over 1981-3 and despite record U.S. trade deficits, including a bilateral deficit with Japan that reached \$50 billion in 1985. The real exchange rate based on the *wholesale price index* (WPI) did show a decline in U.S. competitiveness, but this measure (representing a rise in the prices of U.S. goods relative to Japanese goods) rose only 4.4 percent from 1973 to 1983, hardly enough to account for the trade deficit.

In contrast, real exchange rates based on the prices of *traded goods* alone paint quite a different picture. During this same 11-year period, the real exchange rate based on value-added deflators in the traded sector rose by 27 percent, and in the manufacturing sector alone by 35 percent. Similarly, the real exchange rate based on *unit labor costs* in the traded sector rose by 38 percent. These figures are much more consistent with the loss in U.S. competitiveness reflected in recent U.S. trade performance.

The differential movements in real exchange rates are explained well by relative trends in productivity in the two countries. One can see this in a comparison between the real exchange rate based on the general GDP (gross domestic product) deflator (a general measure of inflation) and that based on unit labor costs for traded goods alone. According to my estimates, the high rate of growth of productivity in the Japanese traded sector required a relative fall of 38 percent in the real exchange rate based on the broader price index over 1973-83. The actual relative movement was almost exactly 38 percent. In the case of real exchange rates based on CPIs and on unit labor costs, productivity differentials (with changes in raw materials prices) also explained a large percentage of the fall in one real exchange rate relative to the other, although not all of it.

While these *relative* movements in real exchange rates are driven by productivity growth patterns in the two economies, the *absolute* movements in real exchange rates are governed by macroeconomic conditions. U.S. trade performance during the past five years has deteriorated because the rise in the dollar's nominal value has driven up the real exchange rates that matter

for trade performance: those based on traded goods. The real exchange rates based on such broad price indexes as the CPI, WPI, or GDP deflator have changed little overall. Although those rates are widely cited, they are irrelevant to U.S. exporters.

Another way to look at the situation is that to maintain the competitiveness of the U.S. traded goods sector over this 11-year period, the real exchange rate based on the GDP deflator would have had to fall by almost 40 percent relative to unit labor costs in the traded goods sector. Similar adjustments would have had to occur in the real exchange rate based on the CPI or the WPI. But the misalignment of the dollar has prevented such adjustments. The recent fall from 260 yen/dollar in February 1985 to 155 yen/dollar in October 1986, on the other hand, should go far toward restoring overall U.S. trade competitiveness vis-à-vis Japan.

Nonetheless, focusing on traded goods, or even manufactured goods alone, hides considerable variation in productivity growth and competitiveness among the subsectors of manufacturing in the United States and Japan. This variation is superimposed on the trends for manufacturing as a whole, so that some subsectors in the United States might fare well in times when the dollar is overvalued, while other subsectors might suffer even during times of undervaluation of the dollar.

The GDP accounts of the two countries provide a breakdown of manufacturing into subsectors. Nominal and real GDP, as well as employment, are divided into nine subsectors, enabling us to construct real exchange rates based on value-added deflators and productivity measures on a disaggregated basis.

Table 1 lists the nine subsectors and the weights in the 1980 U.S. and Japanese GDPs. Subsector eight (fabricated metal products, machinery, and equipment) represents 44 percent of U.S. manufacturing and about 50 percent of Japanese manufacturing, so the relative competitiveness of that subsector is particularly important.

Figure 1\* illustrates the movement in real exchange rates or relative prices for the subsectors of manufacturing, as well as for manufacturing as a whole. In this figure, a rise in the real exchange rate or relative value-added deflator represents a real depreciation of the yen or a loss in competitiveness for U.S. manufacturing. In manufacturing as a whole, U.S. prices rose relative to Japanese prices by 35 percent (measured by fitting the real exchange rate series to a trend between 1973 and 1983). But this trend for manufacturing as a whole masks a wide variation across subsectors. At one extreme, subsector one (food, beverages, and tobacco) saw a relative fall in U.S. prices of 31 percent. But at the other extreme, subsector eight registered a

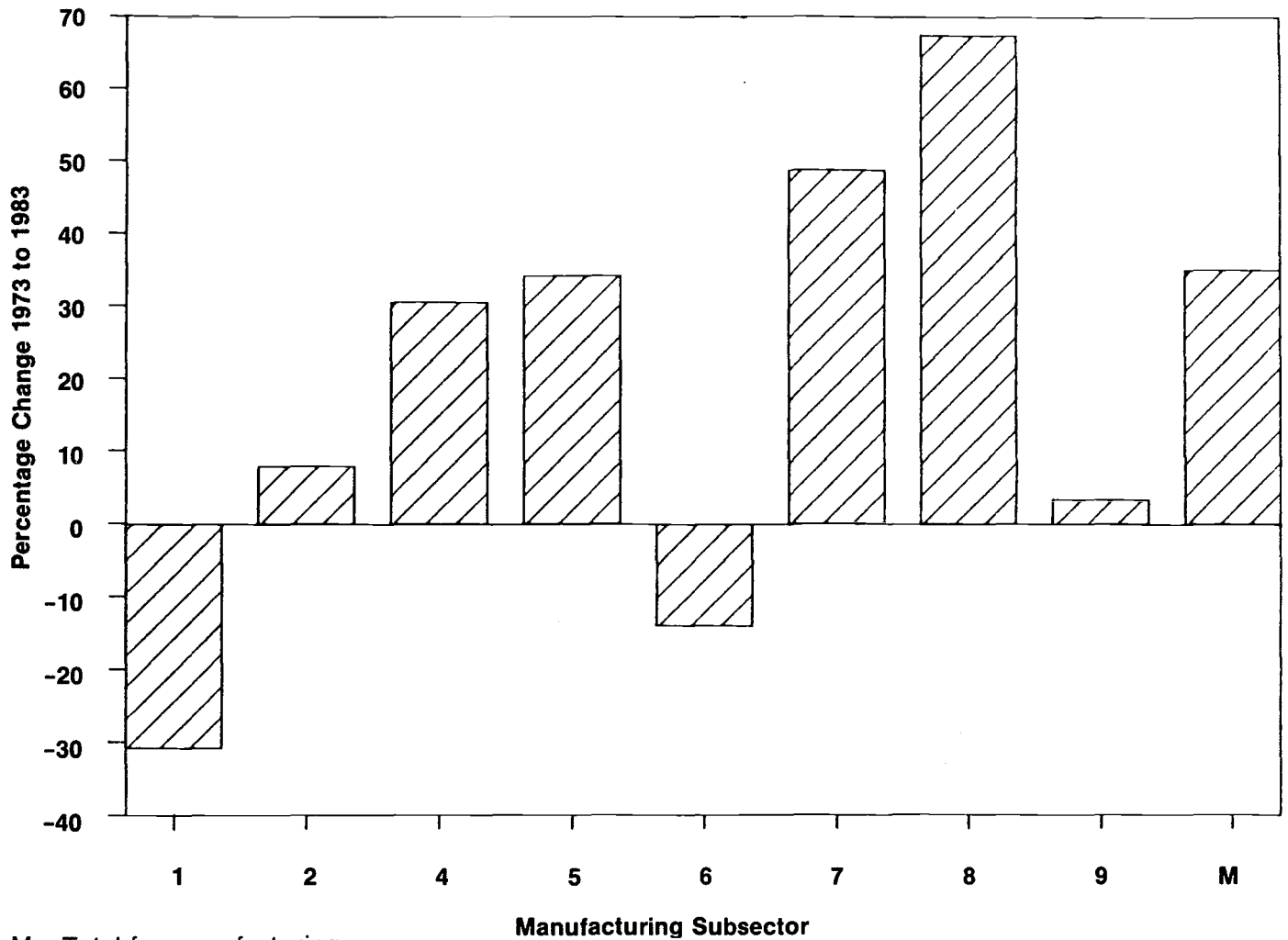
\* The third manufacturing subsector (wood and wood products, including furniture) is of negligible importance to Japan, so it has been omitted from Figures 1 and 2.

**Table 1. List of Subsectors for Manufacturing**

- 1: Food, beverages, and tobacco
- 2: Textile, wearing apparel, and leather industries
- 3: Wood and wood products, including furniture
- 4: Paper and paper products, printing and publishing
- 5: Chemicals and chemical petroleum, coal, rubber, and plastic products
- 6: Nonmetallic mineral products except products of petroleum and coal
- 7: Basic metal industries
- 8: Fabricated metal products, machinery, and equipment
- 9: Other manufacturing industries

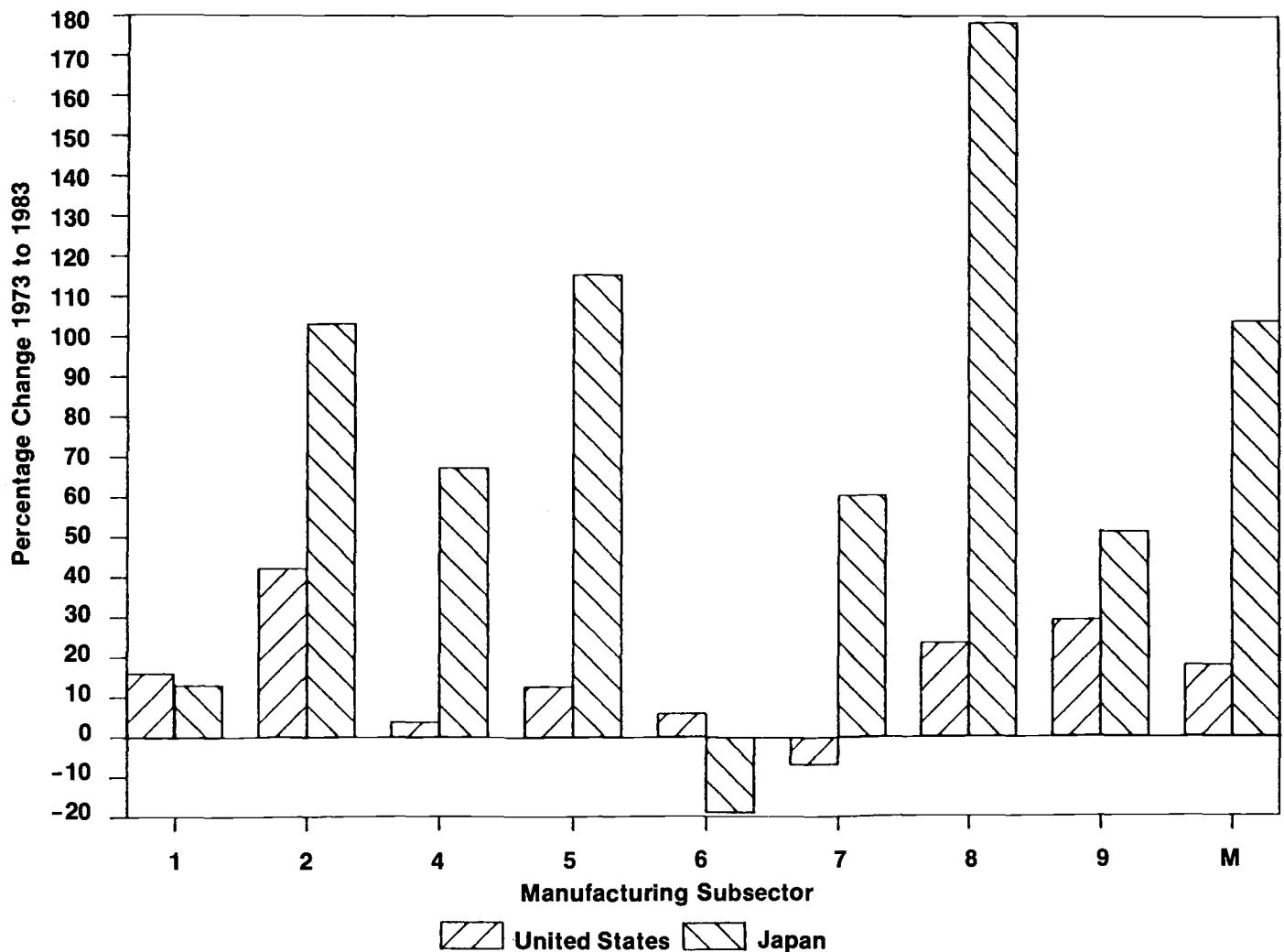
Subsector	GDP Weights for 1980								
	1	2	3	4	5	6	7	8	9
United States	.113	.065	.043	.087	.140	.029	.069	.440	.015
Japan	.081	.037	.000	.023	.096	.029	.104	.503	.126

**Figure 1. Relative Value-Added Deflators by Subsector  
(U.S. Prices Relative to Japanese Prices)**



M = Total for manufacturing

**Figure 2. Rates of Growth of Productivity  
(Trend Growth by Subsector, 1973-1983)**



M = Total for manufacturing

relative rise of 68 percent in U.S. prices. This pattern across subsectors reflects shifts in comparative advantage as, for example, Japan increased its competitiveness in machinery and equipment at the expense of food manufacturing, textiles, and other less technologically advanced products.

These shifts in comparative advantage are most easily seen if we imagine that the real exchange rate for manufacturing as a whole remained constant over the period (that is, if we imagine that the dollar did rise in the early 1980s and thereby did drive up the real exchange rate in manufacturing). In that case, the relative prices of U.S. goods in the food and beverage subsector would have fallen by over 60 percent, while relative prices in machinery and equipment would have increased by a little less than 35 percent. Because the real exchange rate for manufacturing as a whole actually rose by 35 percent over the period, the loss in competitiveness in machinery and equipment was much larger than it would have been if the dollar had not appreciated so much relative to the yen.

The pattern of relative price movements across subsectors is closely related to relative productivity growth in the two countries. Figure 2 shows productivity in the United States and Japan measured as a trend over 1973-83 for the same subsectors as before. In all but two subsectors, productivity growth in Japan exceeds that in the United States, in several cases by large margins. But the magnitude of the gap varies widely. In the machinery and equipment subsector, the gap is 155 percentage points: productivity in Japan grew by a remarkable 178 percent compared with 23 percent in the United States. For manufacturing as a whole, the gap is 86 percentage points.

The pattern of productivity growth across sectors is the main determinant of relative price changes by sector. This pattern is confirmed by comparing Figures 1 and 2. For example, the two subsectors in which U.S. productivity growth exceeds that of Japan, subsectors one (food and beverages) and six (mineral products) are those in which the relative price of U.S. goods has fallen over the same period. Similarly, subsector eight



(machinery and equipment), in which the gap between Japanese and U.S. productivity growth is largest, is experiencing the greatest rise in U.S. prices relative to those in Japan. More generally, if we compare the relative price change in any subsector with the productivity gap in the same subsector (both measured relative to manufacturing as a whole), we find that the correlation over the 11-year period is almost perfect (.906).

Since the pattern of relative sectorial price changes is so strongly influenced by the pattern of productivity growth across sectors, these price patterns should persist even though the misalignment of the dollar relative to the yen has been largely eliminated in recent months. On the other hand, now that the dollar has risen in relation to the yen, misalignment will no longer compound an already serious problem of sectorial adjustment in manufacturing.

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## Economic Outlook Survey

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### Fourth Quarter 1986

Victor Zarnowitz

According to the November survey of 24 professional forecasters taken by NBER and the American Statistical Association, real GNP will increase 2.5 percent in 1986-7 and 2.9 percent in 1986:4-1987:4. Three months ago the group projected slightly higher growth rates. The downward revisions are related to the somewhat disappointing performance of the economy in recent months. However, most of the 24 respondents expect the expansion to continue at a relatively slow but steady pace, with a good chance of improvement late in 1987.

#### Less Optimism on Growth

The predictions of growth rates for 1987 range from 1.3 percent to 4.0 percent. Three-fourths of the forecasts fall between 2.0 percent and 3.5 percent. About 60 percent of the respondents expect the economy to perform below the long-term average trend rate of 3 percent. These results indicate increased agreement among the forecasters as compared to the previous survey, as well as reduced optimism.

The mean percentage distributions based on the individual probabilistic forecasts of real GNP growth in 1986-7 confirm these shifts, as shown by the following summary:

Percentage Change in Real GNP	Mean Response (Percentage)	
	September 1986	December 1986
4.0 percent or more	15	9
2.0 to 3.9 percent	45	60
0 to 1.9 percent	28	25
Negative	12	6

#### Low Chances of a Recession in 1987

The forecasts of less growth do not imply a higher probability of a downturn. For the five successive quarters 1986:4-1987:4, individual assessments that the economy's output will decline average 8, 21, 18, 16, and 16 out of 100, respectively—lower than their September counterparts that varied from 18 to 23. No respondent thought that a recession was likely in 1987.

#### Inflation Still Temperate but Probably on the Rise

According to the median forecast, the GNP implicit price deflator (IPD) will rise 2.5 percent in 1986:4 and 3.1 percent in 1986:4-1987:4. These figures are well below the revised estimate of 3.8 percent for 1986:3 released on December 17 (after the survey), which reflects a pickup in energy and food prices. But there is much dispersion among the individual predictions of inflation, and their distribution is skewed toward the upper end. The mean for the year ahead is 3.3 percent with a standard deviation of 1.1 percent. Ten responses equal or exceed 3.5 percent, five equal or exceed 4.0 percent. The shift to expectations of higher inflation is clear if not large, as shown by the following mean percentage distributions for the individual probabilistic forecasts of the rate of change in IPD:

Percentage Change in IPD	Mean Response (Percentage)	
	September 1986	December 1986
6.0 percent or more	5	6
4.0 to 5.9 percent	19	20
2.0 to 3.9 percent	62	67
Less than 2.0 percent	14	7

#### Relatively Small Changes Seen in Interest Rates

Most forecasters think that the three-month Treasury bill rate will remain between 5.0 percent and 5.4 percent through mid-1987, then will drift up slowly. The median predictions are 5.1 percent for 1987:1 and 1987:2, and 5.2 percent and 5.5 percent for 1987:3 and 1987:4, respectively. The average for 1987 is 5.2 percent, lower than that for 1986 (5.9 percent). But the individual forecasts are dispersed. Three out of ten responses have the bill rate lower in 1987:4 than in 1986:4. The range for 1987:4 is 4.4-6.2 percent.

## Projections of GNP and Other Economic Indicators, 1986-7

	Annual				
	1985 Actual	1986 Forecast	1987 Forecast	Percent Change	
				1985 to 1986	1986 to 1987
1. Gross National Product (\$ billions)	3998.1	4213.0	4448.5	5.4	5.6
2. GNP Implicit Price Deflator (1982 = 100)	111.5	114.6	118.0	2.8	3.0
3. GNP in Constant Dollars (billions of 1982 dollars)	3585.2	3678.0	3771.0	2.6	2.5
4. Unemployment Rate (percent)	7.2	7.0	6.9	-0.2 <sup>1</sup>	-0.1 <sup>1</sup>
5. Corporate Profits After Taxes (\$ billions)	131.4	139.0	147.5	5.8	6.1
6. Nonresidential Fixed Investment (billions of 1982 dollars)	461.4	457.0	457.0	-1.0	0.0
7. New Private Housing Units Started (annual rate, millions)	1.74	1.85	1.72	6.20 <sup>2</sup>	-7.03 <sup>2</sup>
8. Change in Business Inventories (billions of 1982 dollars)	9.0	15.1	18.5	6.1 <sup>3</sup>	3.4 <sup>3</sup>
9. Treasury Bill Rate (3-month, percent)	7.49	5.94	5.20	-1.55 <sup>1</sup>	-0.74 <sup>1</sup>
10. Consumer Price Index (annual rate)	3.6	2.0	3.3	-1.6 <sup>1</sup>	1.3 <sup>1</sup>

	Quarterly							Percent Change	
	1986 Q3 Actual	1986 Q4	Q1	1987 Forecast			Q4		
					Q2	Q3	Q4		
1. Gross National Product (\$ billions)	4234.3	4291.5	4341.5	4405.5	4482.0	4565.0	5.8	6.4	
2. GNP Implicit Price Deflator (1982 = 100)	115.0	115.7	116.6	117.3	118.3	119.3	2.9	3.1	
3. GNP in Constant Dollars (billions of 1982 dollars)	3683.3	3709.0	3730.0	3755.3	3782.0	3816.5	2.7	2.9	
4. Unemployment Rate (percent)	6.9	6.9	7.0	6.9	6.9	6.8	0.0 <sup>1</sup>	-0.1 <sup>1</sup>	
5. Corporate Profits After Taxes (\$ billions)	145.5	142.5	140.0	144.0	150.5	152.3	3.4	6.9	
6. Nonresidential Fixed Investment (billions of 1982 dollars)	457.1	458.6	453.5	455.0	458.0	462.5	0.2	0.9	
7. New Private Housing Units Started (annual rate, millions)	1.76	1.75	1.72	1.71	1.71	1.73	-2.84 <sup>2</sup>	-0.86 <sup>2</sup>	
8. Change in Business Inventories (billions of 1982 dollars)	-4.5	10.0	18.5	14.5	21.0	14.8	25.5 <sup>3</sup>	4.8 <sup>3</sup>	
9. Treasury Bill Rate (3-month, percent)	5.53	5.25	5.10	5.10	5.25	5.50	-0.28 <sup>1</sup>	0.25 <sup>1</sup>	
10. Consumer Price Index (annual rate)	2.9	3.1	3.3	3.5	3.7	3.9	0.8 <sup>1</sup>	0.8 <sup>1</sup>	

SOURCE: National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, December 1986. The figures on each line are medians of twenty-four individual forecasts.

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

<sup>2</sup>Possible discrepancies in percentage changes are caused by rounding.

<sup>3</sup>Change in billions of dollars.

Similar patterns of change are projected for the yield on new high-grade corporate bonds, which most responses place between 8.7 percent and 9.5 percent in 1987:4.

### Consumption and Housing: Weak Gains and Mild Declines

Of the major expenditure components of real GNP, consumption will be a source of weakness in the near future rather than strength as in the recent past. The median forecast has consumer expenditures down less than 1 percent at an annual rate in 1986:4, then up less than 2 percent in 1987:1 and 2.3-2.6 percent in the following three quarters. The gain in 1985-6 is expected to be 4.1 percent, the gain in 1986-7 only 2.7 percent.

Residential fixed investment will fall about 4 percent between 1986:4 and 1987:4, according to the survey averages. The trifling rise of 0.6 percent predicted for 1986-7 stands in sharp contrast to the gain of about 9 percent in 1985-6. Most forecasters see the decline in housing starts as tapering off late in 1987. On the average, the losses in starts are 7 percent for 1986-7, and less than 5 percent for 1986:4-1987:4.

### Business Investment: Getting Worse, Then Better

Nonresidential fixed investment will be slightly lower in the first half of 1987 than in the second half of 1986,

according to the survey averages. Its overall level in 1987 may be about the same as in 1986. But most respondents anticipate improvements in the second half of 1987, with average gains of 2.7 percent in 1987:3 and 4.0 percent in 1987:4.

Most survey participants expect inventory investment to be positive and rising but only a few see it as gathering much strength in 1987.

## Reduced Trade Deficits Improve Industrial Outlook

Net exports of goods and services are expected to average a deficit of \$123 billion (1982 dollars), with a standard deviation of \$26 billion, in 1987:4. This compares with a deficit of \$162 billion (1982 dollars) in 1986:3. Many individuals predict much larger reductions in the trade deficit, while some remain pessimistic.

The lower trade deficits should help raise the growth rate of industrial production. The median forecasts show little gain in the output of manufacturing, mining, and public utilities through 1987:1 but predict rises of 3.2 percent (annual rate) in 1987:2 and 4.8 percent in the second half of 1987. The average increases for 1985-6, 1986-7, and 1986:4-1987:4 are 1.0 percent, 2.2 percent, and 3.2 percent, respectively.

## Policy and Other Assumptions

The forecasts are based on the new tax code. They generally assume that no new changes or surprises will occur in this area at least until 1988, but a few respondents foresee some increase in the overall tax burden in 1987.

Federal government purchases of goods and services will rise, but slowly. The average forecasts are 1.7 percent for 1985-6, 1.8 percent for 1986-7, close to 1.0 percent for 1986:4-1987:4. The reported assumptions about defense spending in 1987 agree that it will not exceed 3 percent. Growth in state and local government expenditures is expected to average 2.8 percent in 1986-7 and 2.4 percent in 1986:4-1987:4.

Numerical estimates of monetary growth in 1987 range from 6 to 13 percent for M1 (mostly around 9 to 11 percent) and 5 to 11 percent for M2 (mostly around 7 to 10 percent). Most forecasters assume that oil prices per barrel will vary between \$14 and \$18; the outliers are \$12 and \$20. The demand for energy is expected to increase mildly.

Most respondents predict that the dollar will continue to decline. The estimates for 1986-7 vary from 3 percent to 1 percent. Of those who quantified their predictions of exchange rates, only three anticipate essentially no further depreciation.

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*This report summarizes a quarterly survey of predictions by 24 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison of NBER, was responsible for tabulating and evaluating this survey.*

## Charles H. Berry

Charles H. Berry, professor of economics and public affairs at Princeton University, has served on NBER's Board of Directors since 1969. Berry was born in Ottawa, Canada, and holds a B.Sc. (AGR) degree from McGill University, an M.Sc. degree from the University of Connecticut, and a Ph.D. from the University of Chicago.



He began his teaching career as instructor in economics at Yale University in 1955 and was promoted to assistant professor in 1957. He taught at Yale until 1963, when he joined the Economic Studies Division of the Brookings Institution in Washington, DC. Berry came to Princeton as associate professor of economics and public affairs in 1966 and was promoted to professor in 1971.

At Princeton, he has taught regularly in both the Department of Economics and at the Woodrow Wilson School of Public and International Affairs. He was named

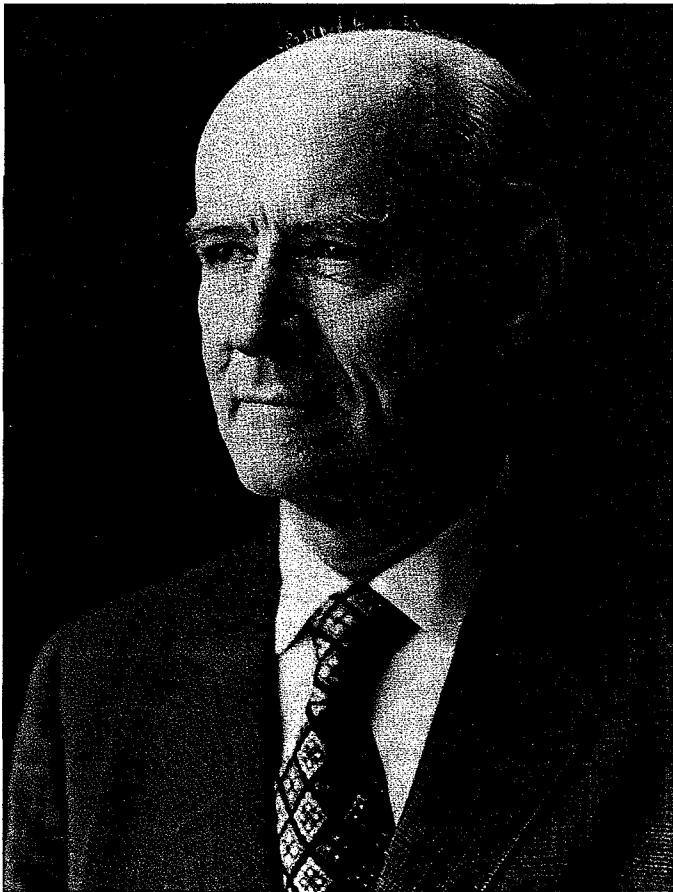
associate dean and director of the Graduate Program in the Woodrow Wilson School in 1975, held that position for three years, and was again named associate dean for a five-year term beginning in 1980. In 1986, he was appointed master of Rockefeller College, one of Princeton's five residential colleges.

Berry is the author of two books: *Voluntary Medical Insurance and Prepayment*, published in 1965, and *Corporate Growth and Diversification*, published in 1975. He has been a frequent consultant to the federal governments of both Canada and the United States.

Berry is married to the former Gisella Erdody. They have a son and two daughters. His major extracurricular interest is a summer house on a remote island 70 miles north of Ottawa.

## George T. Conklin, Jr.

George T. Conklin, Jr., was elected vice chairman of NBER's Board of Directors at their September meeting in New York. He has served as an NBER director since 1978 and has also been a member of the Bureau's Investment Committee and Executive Committee.



Conklin is a graduate of Dartmouth College and holds a master's degree from Dartmouth College and a Ph.D. from New York University. He joined The Guardian Life in 1939 as assistant to the president and director of research. In 1957 he was elected to the board of Guardian

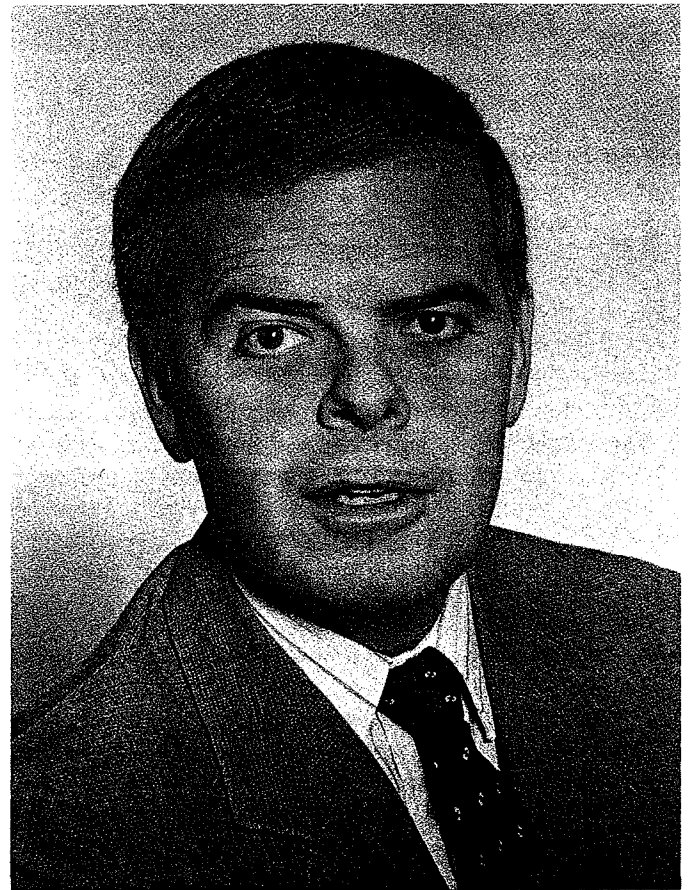
Life and became president in 1969, chief executive officer in 1971, and chairman of the board and CEO in 1977. In 1980 Conklin was appointed director and chairman of the Investment Committee, and chairman of the Guardian Park Avenue Fund. In 1985 he was named consulting director of the company.

Conklin is also a trustee of Adelphi University. In addition, he chairs the Investment Advisory Committee of the New York State Teachers' Retirement System and the Economic Advisory Group of AT&T.

Conklin and his wife, Julie, live in Port Washington, NY. He has four children and three grandchildren. Conklin's hobbies are reading, tennis, golf, music, and dance.

## Richard C. Marston

Dick Marston, a professor of finance and economics at the Wharton School of the University of Pennsylvania, has been a research associate in NBER's Program in International Studies since 1979. Marston received an A.B. in history from Yale University, a B.Phil. in economics from Balliol College, Oxford University, and a Ph.D. in economics from MIT. In addition to his post at the University of Pennsylvania, he has had visiting appointments at the London Business School, Ecole Supérieure des Sciences Economiques and Commerciales in Paris, the Institute for Advanced Studies in Vienna, and Chulalongkorn University in Bangkok, Thailand.



Marston is on the editorial boards of the *Journal of Economic Literature*, *Journal of International Money and Finance*, and *Empirical Economics*. His research centers on international finance, including exchange rate determination and stabilization policies in open economies. He is currently directing an NBER project on the long-term effects of exchange rate misalignment.

Marston lives in Narberth, PA, with his wife Jerrilyn, a lawyer and historian, and two daughters. He spends his free time bicycling, trying to stay ahead of his older daughter in tennis, and traveling abroad.

Golbe and White show that the wave of merger activity that took place in the 1980s was much smaller than two similar waves: one that occurred at the turn of the century and a second in the late 1920s. They further find that there has been no noticeable impact on competitive conditions in most industries as a result of recent mergers and acquisitions.

Taggart examines the recent rise in junk bond finance and dispels a number of common concerns about it. First, he shows that junk bonds represent a relatively small fraction, about 14 percent, of total corporate debt outstanding. Moreover, contrary to popular fears, federally insured savings and loan associations hold only 0.5 percent of their assets in junk bonds. Further, only a small fraction of merger and acquisition activity has been financed by junk bonds. Finally, Taggart shows that junk bonds have performed favorably relative to higher-grade bonds, and any difference in returns cannot be explained fully by apparent differences in the risks of these assets.

Ruback examines the various methods that corporations have developed to resist takeover attempts—including poison pills, dual class recapitalization, and staggered terms for board directors—and assesses their effectiveness at resisting takeovers and their effect on stock prices. He finds that takeover defenses that give managers the power to veto a takeover have generally caused a decline in the value of the firms' shares.

Auerbach and Reishus ask whether the tax system actually encourages merger activity. Contrary to popular belief, they find that tax benefits in general were not a significant factor in the majority of large mergers and acquisitions that occurred in the decade ending in 1983. However, they do find that of all of the tax benefits, the potential transfer of unused tax credits and tax losses was the most important tax-related factor for the acquisitions and mergers that took place in the 1970s and early 1980s. This benefit was present in 20 percent of their sample of mergers and acquisitions.

Finally, Shleifer and Vishny study management buyouts of public companies. They find that these transactions generally have been beneficial to those involved: shareholders earn a 50 percent premium on average, managers gain a larger equity stake, and sponsoring investment bankers receive high fees and realize 50 percent annual returns (over five to seven years) on their equity investment. In addition, in many cases in which the company ultimately went public again, it increased its value many times over. Shleifer and Vishny speculate that some of these gains to shareholders, investment bankers, and managers come from increased efficiency and some from reduced tax payments made possible by 1981 changes in the tax code.

A volume containing these papers, edited by Auerbach, will be published by the University of Chicago Press. Its availability will be announced in a future issue of the *NBER Reporter*.

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## Conferences

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### Mergers and Acquisitions

Approximately 50 finance specialists from the business community attended an NBER conference on Mergers and Acquisitions in New York City on October 7. The conference was organized by Alan J. Auerbach of NBER and the University of Pennsylvania. The authors and the topics discussed were:

Devra Golbe, Rutgers University, and Lawrence White, New York University, "Mergers and Acquisitions: An Aggregate and Historical Analysis"

Robert A. Taggart, Jr., NBER and Boston University, "The Growth of the 'Junk Bond' Market and Its Role in Financing Takeovers"

Richard Ruback, MIT, "Takeover Defenses and Stockholder Wealth"

Alan J. Auerbach, and David Reishus, Harvard University, "The Impact of Taxation on Mergers and Acquisitions"

Andrei Shleifer, NBER and Princeton University, and Robert Vishny, University of Chicago, "Management Buyouts as a Response to Market Pressure"

# International Symposium on the United States and Japan

NBER and Japan's Ministry of Finance (MOF) co-sponsored an International Symposium on "Current Theoretical and Policy Issues in the U.S. and Japanese Economy" in Tokyo on October 16-17. The program was:

Opening statement by Ryuichiro Tachi, President, Institute of Fiscal and Monetary Policy, MOF

Keynote speech by Mitsuhide Yamaguchi, Special Advisor to the Institute of Fiscal and Monetary Policy, MOF

## FIRST SESSION

Chairman: Ryuichiro Tachi

Masaaki Homma, Osaka University, "Sensitivity of Private Consumption to the Choice of Tax versus Public Debt: A Macro Test of the Neutrality Hypothesis in Japan"

Discussants: Seiritsu Ogura, Saitama University, and Shun-ichi Nagata, Director, Research Division, Budget Bureau, MOF

## SECOND SESSION

Chairman: Yukio Noguchi, Hitotsubashi University

Joel B. Slemrod, NBER and University of Minnesota, "International Capital Mobility and the Theory of Capital Income Taxation"

Charles Horioka, Kyoto University, "On the Determinants of Household Saving in Japan: Evidence from a Cross-City Analysis"

Discussants: Toshiaki Tachibanaki, Kyoto University; Tsuneo Ishikawa, Tokyo University; and Kazuo Yoshida, Osaka University

## THIRD SESSION

Chairman: Akiyoshi Horiuchi, Tokyo University

Takatoshi Ito, NBER and University of Minnesota, "The Intradaily Exchange Rate Dynamics and Monetary Policies After the G-5 Agreement" (NBER Working Paper No. 2048)

Kazuo Ueda, Osaka University, Senior Economist, Institute of Fiscal and Monetary Policy, "Japanese Capital Outflows: 1971-1985"

Discussants: Kunio Okina, Tsukuba University; Masahiro Kawai, Tokyo University; and Takehiko Kondo, Director, Research Division, International Finance Bureau, MOF

## FOURTH SESSION

Chairman: Iwao Nakatani, Osaka University

Alan J. Auerbach, NBER and University of Pennsylvania, "Cost of Capital in the United States and Japan: A Comparison" (NBER Working Paper No. 1762)

Heizo Takenaka, Senior Economist, Institute of Fiscal and Monetary Policy, "An Analysis of Cost of Capital from Comparative Perspective"

Discussants: Takao Kobayashi and Takaaki Waka-sugi, Tokyo University; and Haruhiko Kuroda, Counselor, Research and Planning Division, MOF

In the first paper discussed, Homma uses time-series data on aggregate Japanese consumption to test whether government fiscal decisions are offset by private decisions, so that their net effect is neutral. He concludes that this "neutrality hypothesis" cannot be rejected for the Japanese economy as a whole. However, consumption data broken down by age group do not exhibit such neutrality consistently.

Next, Slemrod examined capital income taxation in an open economy, questioning whether standard propositions need to be altered and what new questions need to be addressed. His paper investigates the nature of equilibrium in an open economy, the importance of foreign tax systems, and the role of largeness and uncertainty. He concludes that the challenge of future research is to develop models of taxation in an open economy that are theoretically consistent and that can generate observed patterns of saving and investment that apparently imply imperfect capital mobility.

Horioka's paper investigates the determinants of household saving in Japan. Using cross-sectional data from 48 prefectures, he finds that both growth in disposable income and the extent of bonus income affect saving positively. The rate of return on total saving appears to have no effect, although the composition of saving into real versus financial assets seems to be related to the relative rate of return offered on these assets.

In the third session, Ito considered the importance of government intervention as opposed to fundamental market factors in determining changes in exchange rates. His study observes intradaily changes in the dollar-yen exchange rate in the Tokyo, European, and New York markets following the G-5 meeting in September 1985. He finds that the decline in oil prices after January 1986, and changes in monetary and fiscal policies, each contributed to changes in exchange rates. However, the hypothesis that coordinated intervention can affect the exchange rate is not strongly supported by the data.

Ueda's paper (joint work with Mariko Fujii of the MOF) analyzes the pattern of movements in Japan's long-term capital account during the 1970s and 1980s. The paper suggests that the large increases in capital outflows during the 1980s were caused in part by high U.S. interest rates. Other important factors include the relaxation of restrictions on holdings of foreign securities, increased sensitivity of households and corporations to interest rate changes, domestic financial liberalization, and the resulting increase in competitiveness.

Auerbach's paper (written jointly with Albert Ando, University of Pennsylvania) uses market data and financial statements from a large sample of nonfinancial

corporations to estimate returns on capital in the United States and Japan. The conclusion is that the cost of capital is significantly lower in Japan than in the United States. This difference cannot be explained by differences in corporate taxes paid (which are higher in Japan), or by greater Japanese use of tax-deductible debt. Possible explanations for the gap in returns include: more favorable individual tax treatment of capital income in Japan; the high Japanese rate of saving, which has not been allowed to flow out of the country; or, the lower risk faced by Japanese firms.

Finally, Takenaka estimated the (Jorgensonian) user cost of capital for several countries, including the United States and Japan. His conclusion is also that the cost of capital is lower in Japan than in the United States. Again, tax factors are relatively unimportant in explaining this finding. One important contributing factor, however, is that the relative purchase price of capital goods is lower in Japan than in the other countries he studied.

## Tax Policy and the Economy

One hundred members of the business, government, and legal communities and the press attended NBER's first annual conference on Tax Policy and the Economy in Washington, D.C., on November 17. The following papers were presented:

B. Douglas Bernheim, NBER and Stanford University, "Does the Estate Tax Raise Revenue?" (NBER Working Paper No. 2087)

Jeffrey Harris, NBER and MIT, "The 1983 Increase in the Federal Cigarette Excise Tax"

Michael J. Boskin, NBER and Stanford University, and Douglas J. Puffert, Stanford University, "Social Security and the American Family"

Herman B. Leonard and Richard J. Zeckhauser, NBER and Harvard University, "To Forgive but Not Forget: Amnesty and Tax Policy" (NBER Working Paper No. 2096)

John B. Shoven, NBER and Stanford University, "New Developments in Corporate Finance and Tax Avoidance: Some Evidence" (NBER Working Paper No. 2091)

Alan J. Auerbach, NBER and University of Pennsylvania, and James M. Poterba, NBER and MIT, "Why Have Corporate Tax Revenues Declined?"

Bernheim's study suggests that the federal estate tax might reduce federal tax revenues. Because of its many exemptions and the tax avoidance schemes that

are legally permissible, the estate tax has raised only a small amount of revenue—approximately \$6 billion in 1985. The estate tax also encourages such avoidance techniques as making gifts to children, which reduce income tax collections. Standard estimates of the revenue raised by the estate tax, however, do not include its negative impact on income tax collections. Bernheim suggests that the reduction in income tax revenues caused by the estate tax approximately offsets the revenue it generates directly.

Harris examines the effect on prices and consumption of the recent hike in the federal excise tax on cigarettes. Over the last five years, the real price of a pack of cigarettes rose by 36 percent. This price increase was much greater than the increase in the various taxes on cigarettes. However, Harris argues that the tax increase may have provided the opportunity for cigarette producers to collude to raise prices, thus leading to the 36 percent rise. Harris also finds that the tax increase reduced the projected number of new smokers, and he concludes that it almost certainly led to a substantial reduction in potential cigarette-related illnesses.

Boskin and Puffert show that the redistribution of funds between married workers and single workers in the Social Security system dwarfs the much-discussed "marriage tax" effects of the individual income tax. Social Security results in very large redistributions from married women who work to married women who do not, and provides very low rates of return for women who are divorced or widowed. The authors also demonstrate that for many individuals Social Security benefits and contributions are only weakly related.

Leonard and Zeckhauser review the experience of several states with tax amnesty programs and consider the likely effects of a federal tax amnesty program. The authors stress the fact that a de facto amnesty already exists, since the IRS currently waives about half of the penalties it could collect from delinquent taxpayers. They conclude that a full-scale tax amnesty, coupled with stricter enforcement procedures, would raise revenue in the short run and would add taxpayers to the rolls. However, they caution that such a strategy has long-term risks. For example, an amnesty might change attitudes toward the income tax and therefore might undermine the voluntary compliance that ensures the success of the current program.

Shoven examines the effect on tax collections of a trend toward increased share repurchases and mergers. He concludes that these devices have helped and will continue to help corporate shareholders escape the double taxation of dividends. At the same time, these corporate strategies may have cost the Treasury a significant amount of money—perhaps as much as \$25 billion in 1985.

Finally, Auerbach and Poterba examine the striking decline in corporate tax revenues as a share of GNP in the last 20 years. The corporate tax burden relative to GNP is only about one-third as large as it was in 1960. Auerbach and Poterba show that about half of this decline is caused by reductions in corporate profitability

and the other half is the result of changes in tax rules. Even after the 1986 Tax Reform Act is phased in, they conclude, corporate tax burdens relative to profits will be light by historical standards.

A volume containing these papers, edited by Lawrence H. Summers of NBER and Harvard University, will be published by the M.I.T. Press. An announcement of its availability will appear in a future issue of the *NBER Reporter*.

## The Economics of Government Expenditure Programs

About 60 economists from universities throughout the United States and Canada attended an NBER-sponsored Universities Research Conference on "The Economics of Government Expenditure Programs" in Cambridge on November 20 and 21. The conference program, organized by Research Associates Jerry A. Hausman and James M. Poterba, both of MIT, was:

John Bound, NBER and University of Michigan, "The Health and Earnings of Rejected Disability Insurance Applicants"

Discussants: Donald Parsons, Ohio State University, and Paul J. Taubman, NBER and University of Pennsylvania

Theodore Groves and Adolfo Todo-Rovira, University of California, San Diego, "Estimation of the Demand for Local Public Goods: An Alternative to the Median Voter Model"

Discussants: Helen Ladd, Duke University, and Therese McGuire, State University of New York, Stony Brook

John Butler and Jennie Raymond, Vanderbilt University, "The Effect of the Food Stamp Program on Nutrient Intake"

Discussants: Lawrence H. Summers, NBER and Harvard University, and Henry Aaron, Brookings Institution

Donald Deere, Texas A & M University, and Jeffrey A. Miron, NBER and University of Michigan, "The Cross-Sectional Impact of Unemployment Insurance on Layoffs, Employment, and Wages"

Discussant: Lawrence F. Katz, NBER and Harvard University

Thomas Fraker, Mathematica Policy Research, and Robert Moffitt, Brown University, "The Effect of Food Stamps on Labor Supply: A Bivariate Selection Model"

Discussants: Gary Burtless, Brookings Institution, and Henry S. Farber, NBER and MIT

Charles W. Calomiris, Northwestern University, R. Glenn Hubbard, NBER and Northwestern University, and James H. Stock, NBER and Harvard University, "Growing in Debt: The 'Farm Crisis' and Public Policy" (NBER Working Paper No. 2085)  
Discussants: Jeffrey Perloff, University of California, Berkeley, and Lester Thurow, MIT

Frank R. Lichtenberg, NBER and Columbia University, "The Private R and D Investment Response to Federal Design and Technical Competitions"

Discussants: Stanley Besen, The Rand Corporation, and Ariel Pakes, NBER and University of Wisconsin

Bound studies a group of applicants who failed to pass the medical screening for Social Security disability insurance. Using data drawn from 1972 and 1978 surveys, he finds that fewer than 50 percent of these rejected male applicants are working. Of those who are working, typical earnings are less than 50 percent of the median earnings for other men their age. This is consistent with the historical record that shows that there were a substantial number of disabled men out of the labor force before Social Security disability insurance existed. Bound suggests that the disincentive effects of disability insurance may be substantially smaller than suggested by other recent work.

Groves and Todo-Rovira propose an alternative to the median voter model that is frequently used to estimate the demand for local public goods. They explicitly aggregate individual demand functions and find that the demand for certain local public goods (including public education, police and fire protection, public housing, parks and recreation, and overall expenditures) is influenced by the median (or mean) and variance of the income distribution, the progressivity of tax revenues, and various demographic variables. They conclude that their model is potentially useful for exploring the relationships between income and the distribution of political influence in determining the level of local public expenditure.

Butler and Raymond ask whether the Food Stamp Program fulfills its primary goal of increasing the nutrient intake of the poor. Based on a sample of the elderly and of the rural poor, they find after controlling for knowledge of nutrition that the poor would be better nourished without food stamps. They also find that "even rudimentary knowledge of nutrition can increase nutrient intake considerably." They conclude that although the Food Stamp Program increases income and purchases of food, it decreases nutrient intake.

Fraker and Moffitt also study the Food Stamp Program to determine how it affects work effort of the low-income population. Using 1980 data on female heads of families, they find that the Food Stamp Program reduces the labor supply of recipients by about 9 percent. However, marginal changes in the program's benefit-reduction rate have only small effects on hours of work.

Deere and Miron estimate the impact of unemployment insurance (UI) on the allocation of labor across industries. They focus on UI's effects on: (1) the inci-



dence of layoffs in different industries; (2) the distribution of employment between industries with low and high layoff rates; and (3) interindustry wage differentials. Deere and Miron find that a 10 percent increase in the monthly subsidy (UI) to a layoff raises employment in construction by an average of more than 100 workers per state while lowering employment in finance, insurance, and real estate by a similar amount. Their results also indicate that UI has important effects on the cross-sectional allocation of labor, as well as on the overall level of labor utilization.

Calomiris, Hubbard, and Stock examine the role of credit markets in the current farm crisis. Their analysis of state-level panel data on incomes and of balance sheets of farms and financial intermediaries indicates that disruptions in agricultural credit markets can have real effects on farm output. That finding is consistent with the observation that, unlike credit markets for large firms or for firms for which monitoring is less costly, agricultural financial markets require close customer arrangements. Local financial institutions, for which such relationships are best developed, are often unable to diversify their loan risks either within agriculture or across other geographically separated activities. Because of the Farm Credit System's ability to pool agricultural loan risks nationally and its access to national capital markets, it will continue to be an important lender in agricultural credit markets. Their evidence also suggests that the growing dispersion of farm sizes may be traceable to differential access to credit.

Lichtenberg estimates the amount of private R and D investment undertaken in response to government-sponsored design and technical competitions and to government procurement generally. He finds that 29 percent of company R and D investment in 1984 was performed in response to government demand, and that almost *half* of the increase in private R and D between 1979 and 1984 was stimulated by federal procurement. Thus, the government plays a larger role in determining the allocation of U.S. investment in R and D than is generally recognized.

## State and Local Government Finance

On December 12 and 13, Harvey S. Rosen of Princeton University, director of NBER's Project on State and Local Government Finance, chaired an NBER conference in Cambridge on that subject. The two-day program was:

Jane Hannaway, Princeton University, "The Organization and Management of Schools: Peeking Inside the Black Box"

Discussant: Daniel L. Rubinfeld, University of California, Berkeley

Thomas Romer and Howard Rosenthal, Carnegie-Mellon University; and Vincent Munley, Lehigh University, "Economic Incentives and Political Institutions: Spending and Voting in School Budget Referenda"

Discussant: James R. Hines, Jr., NBER and Princeton University

Robert P. Inman, NBER and University of Pennsylvania, "Public Policies Toward Public Deficits: The Case of Teacher Pensions"

Discussant: Wallace E. Oates, University of Maryland

Michael J. Boskin, NBER and Stanford University (joint work with Alan Huber, Stanford University, and Marc S. Robinson, General Motors Research Laboratories), "New Estimates of State and Local Government Tangible Capital and Net Investment"

Discussant: Charles Hulten, NBER and University of Maryland

James M. Poterba, NBER and MIT, "Capital Budgets, Borrowing Rules, and State Capital Spending"

Discussant: Herman B. Leonard, NBER and Harvard University

Charles T. Clotfelter, NBER and Duke University, and Philip J. Cook, Duke University, "Lotteries in State Government Finance"

Discussant: B. Douglas Bernheim, NBER and Stanford University

Katherine Bradbury, Federal Reserve Bank of Boston, and Helen Ladd, Duke University, "Property Taxes and City Tax Bases"

Discussant: Daniel R. Feenberg, NBER

Jeffrey S. Zax, NBER and Queens College (CUNY), "Property Values Assessment and Property Tax Revenues"

Discussant: Theresa McGuire, SUNY Stony Brook

In the first paper presented, Hannaway examines differences in the management practices of public and private schools, especially the degree of influence that principals exercise over school matters (that is, the degree to which the system is decentralized). She finds that principals and teachers in Catholic schools exercise significantly more influence over school matters than their counterparts in public schools do. Moreover, the factors that affect centralization in the public sector do not have the same effect in the private sector.

Romer, Rosenthal, and Munley use a median voter demand model and the results of public referendums on annual school district budget proposals to determine what factors influence levels of educational expenditure. They find that both economic and political considerations influence expenditures on local public services. Using data for 544 New York state school districts, they find that when closed-end matching grants

exist, local school spending responds to the incentives embodied in state aid formulas. At the same time, local school spending reflects certain aspects of the political process. Even when the effects of price, income, and district size are accounted for, it seems that large districts have a tendency to spend more heavily than smaller districts do.

Inman examines the trends in funding for one form of state and local government debt: teacher pensions. He asks how a central government might check any unwanted growth in these liabilities. He concludes that this form of state-local debt is sizable and growing. Further, state and local governments have an implicit bias toward "pay-as-you-go" pension financing that encourages the growth of debt. However, central government regulations on benefits and funding, or policies for debt relief, can slow or even reverse that growth.

Boskin, Huber, and Robinson estimate net investment and depreciation of state and local government capital. They calculate an aggregate net state and local nonresidential capital stock of \$1.8 trillion in 1985, 17 percent larger than the Bureau of Economic Analysis estimate. They also find that net state and local government investment has exceeded the state and local deficit annually for the last 45 years. While the fraction of state and local purchases of goods and services devoted to net investment has fallen, it has exceeded net capital formation by the federal government (except during defense buildups) and has averaged more than 40 percent of net private nonresidential fixed investment since 1951. The net capital stock of state and local governments substantially exceeds state and local debt and is about twice the size of the federal government's capital stock.

Poterba asks whether state budgeting and borrowing rules affect the level of public spending. He compares capital spending in states that maintain separate budgets for capital and operating expenditures with analogous spending in states that employ a unified budget. He also investigates the impact of financing rules, in particular the use of "pay-as-you-go" rules for capital projects, on the level of spending. Poterba's results suggest that states that borrow to finance capital outlays, and those that maintain separate capital and operating budgets, tend to spend more on public capital. These results suggest that fiscal institutions can have important real effects on government outlays.

Clotfelter and Cook observe that lotteries are a small but rapidly growing source of state revenue. Over half of the states now have lotteries, and all 28 lottery agencies have much in common. In every case, a state agency has been given a legal monopoly in lottery games; the implicit tax rate on these games is very high; and the games are heavily advertised and promoted. Lottery agencies seem to try to maximize net revenues. Viewed as a consumer service, legalized state lotteries benefit would-be players. However, the marginal tax rate implied by these lotteries is both regressive and highly concentrated among relatively few heavy players at each income level.

Bradbury and Ladd investigate the relationship between tax rates and city property tax bases using data for 86 large U.S. cities in 1967, 1972, 1977, and 1982. They find that a 10 percent increase in the city's property tax rate decreases the city's tax base by about 1.3 percent. In addition, they find that local income taxes and taxes levied by overlying jurisdictions (such as county and state governments) also have negative, but smaller, impacts on the city's property tax base. Local sales tax rates, in contrast, appear to have little impact. Thus, the authors conclude that taxes affect local property values more than is typically implied by previous studies that have investigated the impacts of state and local taxes on firms' location decisions.

In the final paper of the conference, Zax examines the effect of property assessment ratios on effective property tax rates in Massachusetts municipalities between 1976 and 1983. These municipalities have unusually uniform assessment ratios within jurisdictions. However, assessment ratios vary widely across jurisdictions. This variance presumably reflects differences in policy choices. Zax presents three possible roles for assessment ratios: as veils, compliance measures, and exploitation devices. In Massachusetts, the exploitative role appears to be most important. Municipalities with high expenditures keep assessment ratios low. Effective property tax rates are high in municipalities with low assessment ratios. The threat of property tax reform encourages exploitative assessment practices, but reform itself discourages them.

In addition to those already mentioned, participants at the conference included: David F. Bradford, director of the Bureau's Program in Taxation, also of Princeton University; Geoffrey Carliner, NBER; and Gilbert Metcalf, Harvard University.

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## Conference Calendar

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

Organizations wishing to have meetings listed in the Conference Calendar should send information, comparable to that given below, to Conference Calendar, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please also provide a short (fewer than fifty words) description of the meetings for use in determining whether listings are appropriate for inclusion. The deadline for receipt of material to be included in the Spring 1987 issue of the *Reporter* is February 15. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

**February 12-13, 1987**

International Economic Association Conference on Global International Macroeconomics: Policy Conflict and Cooperation, Center for Economic Policy Research

**February 13-14, 1987**

Conference on Trade Issues, NBER

**February 19-22, 1987**

Mergers and Acquisitions, NBER

**February 27, 1987**

Program Meeting: Financial Markets and Monetary Economics, NBER

**March 6-7, 1987**

The United States in the World Economy, NBER

**March 13-14, 1987**

Macroeconomics, NBER

**March 20, 1987**

Program Meeting: Productivity, NBER

**March 20-21, 1987**

The Economics of Aging, NBER

**March 26-27, 1987**

Program Meeting: Taxation, NBER

**March 26-28, 1987**

Annual Conference, Midwest Economic Association\*

**March 27-28, 1987**

Income and Wealth Conference: Measurement of Savings, NBER

**April 1987**

Annual Conference, Atlantic Economic Society\*

**April 3-5, 1987**

International Coordination of Economic Policy, NBER

**April 10-11, 1987**

State and Local Government Finance, NBER

**April 10-11, 1987**

Program Meeting: International Studies, NBER

**April 23-24, 1987**

Economic Policy Panel, Paris: The New Conservative Economic Policies, Center for Economic Policy Research

**April 24-25, 1987**

Conference, Carnegie-Mellon University-University of Rochester

**May 1-2, 1987**

Carnegie Conference on Political Economy, Carnegie-Mellon University

**May 7-8, 1987**

Misalignment of Exchange Rates, NBER

**May 7-8, 1987**

The Economic Analysis of Labor Markets in the 1930s, Center for Economic Policy Research

**May 8-9, 1987**

Universities Research Conference: Labor Studies, NBER

**June 3-5, 1987**

3rd International Conference, Institute for Monetary and Economic Studies-Bank of Japan

**June 16-17, 1987**

Conference: The Economics of Inventory Management, Wesleyan University-International Society for Inventory Research

**July 6-8, 1987**

Exchange Rate Regimes, Money GDP Targets, and Macroeconomic Policy, Center for Economic Policy Research

**July 7-11, 1987**

Annual Conference, Western Economic Association

**July 10, 1987**

Research Meeting: Economic Fluctuations, NBER

**August 2-5, 1987**

Annual Meeting, American Agricultural Economics Association\*

**August 17-20, 1987**

Annual Meeting, American Statistical Association\*

**August 24-28, 1987**

43rd Congress: Public Finance and Performances of Enterprises, International Institute of Public Finance

**September 4-6, 1987**

Employment Strategies, Enterprise Management, and Industrial Relations, Center for Economic Policy Research

**September 9-12, 1987**

18th Bi-Annual Conference, Center for International Research on Economic Tendency\*

**September 16-17, 1987**

Conference on LDC Policy, NBER

**September 27-October 1, 1987**

Annual Meeting, National Association of Business Economists\*

**October 22-23, 1987**

Economic Policy Panel, Center for Economic Policy Research

**November 8-11, 1987**

80th Annual Conference, National Tax Association-Tax Institute of America\*

**November 17, 1987**

Tax Policy and the Economy, NBER

**November 22-24, 1987**

Annual Meeting, Southern Economic Association\*

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

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

**August 8-11, 1988**

Annual Meeting, American Statistical Association\*

**September 25-28, 1988**

81st Annual Conference, National Tax Association-Tax Institute of America\*

**September 25-28, 1988**

Annual Meeting, National Association of Business Economists\*

**November 20-22, 1988**

Annual Meeting, Southern Economic Association\*

**August 14-17, 1989**

Joint Statistical Meetings, American Statistical Association\*

**September 17-20, 1989**

Annual Meeting, National Association of Business Economists\*

**October 8-11, 1989**

82nd Annual Conference, National Tax Association-Tax Institute of America\*

**November 19-21, 1989**

Annual Meeting, Southern Economic Association\*

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



Marjorie B. McElroy



Harold T. Shapiro

Easterlin, a professor of economics at the University of Southern California since 1982, began his long association with NBER in 1955, and was a member of the research staff until 1966. Easterlin holds an undergraduate degree from Stevens Institute of Technology (1945) and a Ph.D. from the University of Pennsylvania (1953). From 1948 until 1982 he taught economics at the University of Pennsylvania, where he also chaired the department for a number of years and served as an associate dean from 1974-9. Easterlin is also the author of two NBER books: *Population, Labor Force, and Long Swings in Economic Growth* (1968), and *Population and Economic Change in Developing Countries* (1980).

Easterlin has also been a visiting professor at Texas A & M, University of Washington, University of Warwick (England), and Stanford University. He was named a Fellow of the American Academy of Arts and Sciences in 1978, and a Fellow of the Econometric Society in 1983. Easterlin also served as president of the Population Association of America in 1978 and president of the Economic History Association in 1979-80.

Hughes, a native of the state of Washington, has been a professor of economics at Northwestern University since 1966. He holds a Bachelor of Science degree from Utah State University, and a D.Phil. from Oxford.

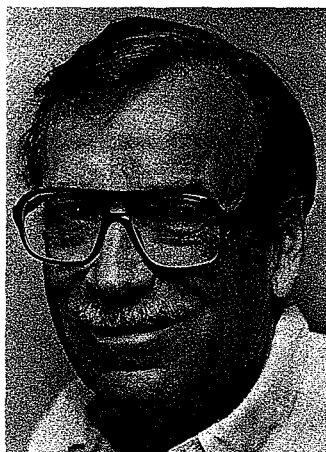
Hughes began his teaching career in 1956 as an assistant professor of economics at Purdue University, where he became an associate professor in 1958, and a professor of economics in 1961. In 1966, he joined Northwestern's economics department as a full professor, and he chaired the department from 1972-4. Hughes has also been a visiting professor at Columbia University, the University of Colorado, and the University of California, Berkeley. Hughes also served as president of the Economic History Association in 1980-1.

McElroy is a professor of economics at Duke University and an associate consultant to Duke's Institute of Statistics and Decision Sciences. Born in Pennsylvania, she received her B.A. from Pennsylvania State University and her Ph.D. from Northwestern. McElroy has been on the economics faculty at Duke since 1970. She also has been a visiting professor at the University

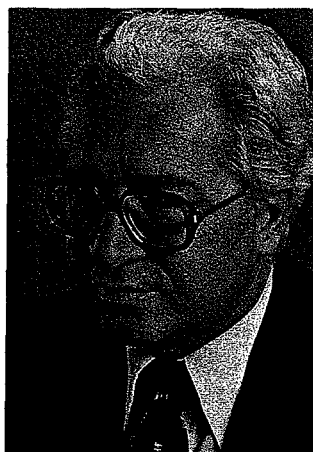
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## Bureau News

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Richard A. Easterlin



Jonathan R. T. Hughes

## NBER Names Four to Board

NBER's Board of Directors elected four new members at its September meeting: Richard A. Easterlin, to replace Douglass C. North as the representative of the Economic History Association; Jonathan R. T. Hughes, to replace Marcus Alexis, from Northwestern University; Marjorie B. McElroy, to replace John Vernon for Duke University; and Harold T. Shapiro, replacing Paul McCracken, for the University of Michigan.

of Chicago, the University of Illinois, and the University of Virginia.

McElroy's research interests include demand systems, labor economics, financial economics, and applied econometrics. She recently chaired a committee that revised the arts and sciences curriculum at Duke University. McElroy has also been an associate editor of *American Statistician* since 1981.

Shapiro has been president of the University of Michigan since 1980 and, since 1977, has also been a professor of economics and public policy at that institution. He received his undergraduate degree from McGill University, and his M.A. and Ph.D. in economics from Princeton.

Shapiro joined Michigan's economics faculty in 1964 as an assistant professor, was promoted to associate professor in 1967, and to professor in 1970. Shapiro also chaired the economics department from 1974-7.

Since 1980, Shapiro has been a member of the Board of Trustees of the Alfred P. Sloan Foundation. He also serves on a number of both corporate and nonprofit boards, and on the Governor's Commission on Jobs and Economic Development in Michigan.

## Frenkel to IMF

NBER Research Associate Jacob A. Frenkel, the David Rockefeller Professor of International Economics at the University of Chicago, became the Economic Counsellor and Director of Research at the International Monetary Fund in Washington on January 2. Frenkel, who has taught economics at the University of Chicago since 1973, was born in Tel Aviv. He received his B.A. in economics and political science from Hebrew University, and his M.A. and Ph.D. in economics from the University of Chicago.

Frenkel has been a visiting professor at Tel Aviv University, Centro de Estudios Macroeconomicos de Argentina (Buenos Aires), and Institute für Weltwirtschaft (Kiel, Germany). He has also been a member of NBER's Programs in International Studies and in Economic Fluctuations since 1978 and is the editor of two NBER volumes: *Exchange Rates and International Macroeconomics* (1983) and *International Aspects of Fiscal Policy* (forthcoming, 1987).

## 1986-7 Research Associates

Andrew B. Abel  
John M. Abowd  
Joshua Aizenman  
Steven G. Allen  
Orley C. Ashenfelter  
Alan J. Auerbach  
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Ernst R. Berndt  
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Michael D. Bordo  
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Michael Denny  
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Daniel Feenberg  
Martin Feldstein  
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Franklin Fisher  
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Richard B. Freeman  
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J. Vernon Henderson  
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Bengt Holmstrom  
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Takatoshi Ito  
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James R. Kearl  
Mervyn A. King  
Alvin Klevorick  
Laurence J. Kotlikoff  
Irving B. Kravis  
Paul R. Krugman  
Edward P. Lazear  
Jonathan S. Leonard  
Richard M. Levich  
Richard Levin  
Eugene M. Lewit  
Jay O. Light  
Robert E. Lipsey  
Robert F. Lucas  
Harold Luft  
Thomas E. MaCurdy  
Charles F. Manski  
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## Conference in May: Labor Markets and the Macroeconomy

On May 8 and 9, 1987, the National Bureau of Economic Research will sponsor a conference in Cambridge on Labor Markets and the Macroeconomy. The program, being organized jointly by Professors John M. Abowd and Orley C. Ashenfelter of NBER and Princeton University, will consist of seven papers with two formal discussants assigned to each paper. There will be no published conference proceedings but the conference will be summarized in the *NBER Reporter*.

The conference will consider a wide variety of issues arising from the linkage between labor markets and the general macroeconomy. Among the topics satisfying these criteria are: the dynamics of wage rates and employment; the role of unemployment, inflation, and economic growth in determining wage structures; negotiated wage settlements and inflation; models of short-term employment dynamics connecting unemployment to general economic conditions; and effects of fiscal and monetary policy on employment, unemployment, and wages. Papers studying labor markets in the United States or in other developed economies, or that compare several economies, are all encouraged. The conference is intended to provide a forum for discussion of a broad range of issues connecting the labor market with the macroeconomy. Priority will be given to new empirical research; however, theoretical papers are also welcome.

Papers will be selected on the basis of abstracts of about 500 words or, when possible, complete papers. Any research that will not be published before November 1987 may be submitted. Authors chosen to present papers will be notified by February 20, 1987. Finished papers must be ready for distribution to conference participants and discussants by April 10, 1987. The NBER will pay the expenses of those chosen to give papers at the conference. Abstracts should be sent to: Professor John Abowd, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138.

## Macroeconomists Hold Fall Meeting

Nearly 100 members and guests of NBER's Program in Economic Fluctuations met in Boston on October 10 to discuss their recent research. The day's agenda was:

John Y. Campbell, NBER and Princeton University, and Robert J. Shiller, NBER and Yale University, "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors" (NBER Working Paper No. 2100)

Discussant: Mark W. Watson, NBER and Northwestern University

Andrew B. Abel, NBER and University of Pennsylvania; and N. Gregory Mankiw, Lawrence H. Summers, and Richard J. Zeckhauser, all of NBER and Harvard University, "Assessing Dynamic Efficiency: Theory and Evidence" (NBER Working Paper No. 2097)

Discussant: Philippe Weil, NBER and Harvard University

Paul M. Romer, University of Rochester, "Increasing Returns and Long-Run Growth"

Discussant: Sumru Altug, University of Minnesota

Robert B. Barsky, NBER and University of Michigan, "Why Don't the Prices of Stocks and Bonds Move Together?" (NBER Working Paper No. 2047)

Discussant: Kenneth J. Singleton, NBER and Carnegie-Mellon University

Christina D. Romer, NBER and Princeton University, "The Prewar Business Cycle Reconsidered: New Estimates of Gross National Product, 1869-1918" (NBER Working Paper No. 1969)

Nathan S. Balke, Southern Methodist University, and Robert J. Gordon, NBER and Northwestern University, "The Estimation of Prewar GNP Volatility, 1869-1938" (NBER Working Paper No. 1999)

Discussant: David Weir, Yale University

Campbell and Shiller investigate the extent to which variation over time in the dividend-price ratio can be explained by changes in expected future dividends versus changes in discount rates. They find that a significant amount of the movement in dividend-price ratios is caused by changes in expected future dividends. There is little support for the alternative hypothesis that time-varying discount rates are important: this is the case only in the version of their model in which discount rates are measured by consumption growth rates. However, Campbell and Shiller find that much of the variation in dividend-price ratios is not accounted for by either factor.

In their paper, Abel, Mankiw, Summers, and Zeckhauser ask how dynamic inefficiency—the overaccumulation of capital—may be diagnosed in an economy where the returns on assets are random. In such an economy, they argue, one cannot simply compare the average growth rate with the marginal productivity of capital, or with the rate of return on a safe asset (such as Treasury bills), to determine whether the economy is overcapitalized. Therefore, they propose using a cash flow criterion: if the economy always consumes a portion of the return to capital (or, equivalently, if investment is less than the cash flow generated by production, net of wage payments), then it is judged to be dynamically efficient. They point out that the U.S. econ-

omy has always satisfied this condition and conclude that the United States does not have too much capital.

Paul Romer's paper develops a model of long-run growth in which the increasing marginal productivity of knowledge is an input in the production process. In the model, an individual firm (whose output is knowledge) faces diminishing returns to the production of *new* knowledge. Because firms are competitive, they do not take into account their impact on the aggregate stock of knowledge when they are choosing how much of it to produce. Thus, the competitive equilibrium is characterized by consumption that is too high, and levels of research that are too low, relative to the social optimum.

Barsky asks why the values of stocks and bonds are not highly correlated over time. He demonstrates that an increase in the risk associated with holding equities has the effect of: (1) decreasing the risk-free rate of interest in the economy; (2) increasing the equity premium (the difference between stock returns and the risk-free interest rate); and (3) possibly changing the level of equity returns. Thus, the fact that stock and bond prices do not move together can be explained by an increase in the nondiversifiable risk associated with holding equities. Barsky also discusses the effects of a reduction in the rate of growth of productivity on equity and bond values: again, the risk-free rate falls, and the effect on the value of the equity is ambiguous.

The final two papers estimate prewar GNP figures. Christina Romer's paper follows the original Kuznets methodology very closely. However, Kuznets's estimates assumed that GNP moved one-for-one with commodity output valued at producer prices; Romer shows that this is not true and constructs estimates that reflect the true relationship between GNP and output more closely. She emphasizes that the resulting "backcast" GNP series exhibits much less volatility than economists previously had thought, and that these results corroborate her earlier studies of the prewar unemployment rate and industrial production.

Balke and Gordon's results stand in marked contrast to Romer's: their estimates show that output was decidedly more volatile in the prewar era than previously thought, and they present a variety of estimates to support this view. Their study differs importantly from Romer's in their use of additional explanatory variables, including freight ton-miles and construction activity, to backcast GNP. None of their results supports Romer's claim that prewar GNP volatility was "spurious"; their estimates of prewar-postwar volatility ratios range from a low of 1.73 to a high of 2.17.

NBER's Program in Economic Fluctuations is directed by Robert E. Hall of Stanford University. This report was prepared with the assistance of Marianne Baxter, University of Rochester.

## Tax Program Meets in Cambridge

Members and guests of NBER's Program in Taxation met in Cambridge on October 23 and 24 to discuss their research. The program for the meeting was:

Alan J. Auerbach, NBER and University of Pennsylvania, and James M. Poterba, NBER and MIT, "Why Have Corporate Taxes Declined?"

Discussant: Jane Gravelle, Congressional Research Service

Lawrence B. Lindsey, NBER and Harvard University, "Individual Taxpayer Response to ERTA, 1982-1984" (NBER Working Paper No. 2069)

Discussant: Daniel R. Feenberg, NBER

Laurence J. Kotlikoff, NBER and Boston University (coauthors Torsten Persson and Lars E. O. Svensson), "Laws As Assets: A Solution to the Time-Consistency Problem" (NBER Working Paper No. 2068)

Laurence J. Kotlikoff, "Is Debt Neutral in the Life-Cycle Model?" (NBER Working Paper No. 2053)

Discussant: Louis Kaplow, NBER and Harvard University

Kenneth L. Judd, Stanford University (joint work with Yves Balcer), "The Efficiency of Capital Taxation: Capital Gains versus Corporate Income"

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

John Whalley, NBER and University of Western Ontario (joint work with Rich Jones), "Regional Effects of Taxes in Canada: An Applied General Equilibrium Approach" (NBER Working Paper No. 2107)

Discussant: Don Fullerton, U.S. Department of the Treasury

Jonathan S. Skinner, NBER and University of Virginia, "Risky Income, Life-Cycle Consumption, and Precautionary Savings"

Discussant: Andrew B. Abel, NBER and University of Pennsylvania

John B. Shoven, NBER and Stanford University, "Share Repurchase and other Nondividend Cash Payments to Equity Holders" (NBER Working Paper No. 2091)

In their paper, Auerbach and Poterba examine the sources of declining corporate tax revenues during the last 25 years. They find that legislative changes explain less than half of the revenue decrease during this period. Falling corporate profits have had a larger influence on revenue collections than all legislative changes taken together. This result is often obscured in studies that focus solely on the average corporate tax rate. Changes in capital recovery provisions were the most important legislative factor influencing corporate tax revenues, especially in the last five years.

This paper also considers the impact of the Tax Reform Act of 1986. Auerbach and Poterba find that the new tax law will increase the average tax rate on corporate profits by approximately 10 percent. By 1990, the average tax rate will equal its level in the late 1970s, although it will remain substantially below its level in the 1960s and early 1970s.

Lindsey's paper compares the tax revenue expected if there had been no tax cuts with the actual revenue received after the Economic Recovery Tax Act (ERTA) mandated a series of personal tax rate reductions for 1982-4. Lindsey finds that at least one-sixth, and probably as much as one-quarter, of the revenue loss attributable to ERTA was recouped by changes in taxpayer behavior over the period. His data also suggest that personal income was as much as 2 percent higher than it would have been as a result of the change in taxpayer behavior caused by the lower rates.

Kotlikoff and his coauthors present a new solution to the time-consistency problem that seems capable of enforcing ex ante policy in a variety of settings in which other enforcement mechanisms do not work. The solution involves formulating a law, institution, or agreement that specifies the optimal ex ante policy and that can be sold by successive old generations to successive young generations. Each young generation pays for the law through taxes. Both old and young generations have an economic incentive to obey the law. For the old generation that owns the law, breaking it makes the law valueless, and the generation suffers a capital loss. For the young generation, the economic advantage of purchasing the existing law exceeds its cost as well as the economic gain from setting up the law.

In a second paper, Kotlikoff questions the widely accepted view that deficits have real effects in the life-cycle model. Standard analyses of deficits within life-cycle models treat the government as a dictatorial entity that can effect any intergenerational redistribution it desires. In contrast, this paper drops the assumption of compulsion and models the government as a coalition of self-interested young and old generations whose bargaining determines government decisions. Since each generation is selfish, no generation will voluntarily absorb the debts of another except as a quid pro quo for receiving particular goods or services. Hence, redistribution per se between generations will not arise. According to Kotlikoff's model, because each generation is ultimately responsible for its own liabilities, deficit finance has no economic impact although it alters the timing of tax receipts.

Judd presents a model of life-cycle savings in an economy with capital gains and corporate income taxation. He shows that capital gains taxation reduces the sensitivity of lifetime consumption to asset returns. He also shows that capital gains are equivalent to age-dependent tax on interest, low in young and old age, high in middle age. Finally, Judd finds that the optimal mixture of capital gains and corporate income taxation is

very sensitive to investors' utility functions and to revenue needs.

Whalley uses an applied general equilibrium regional model for Canada to investigate the regional effects of taxes. He finds that regional effects of taxes can be significant, and in Canada at least, they do not tend to offset one another. In general, richer regions tend to lose and poorer regions to gain from federal taxes, but other regional characteristics such as manufacturing/nonmanufacturing, or resource/nonresource can also be important.

Skinner's paper suggests that precautionary saving against uncertain income is not important. He derives a closed-form approximation for life-cycle consumption subject to uncertain interest rates and earnings. Then, using measures of income uncertainty from the Panel Study of Income Dynamics, he finds that precautionary saving comprises only 13 percent of life-cycle saving. Empirical comparisons of saving patterns among occupational groups using the Consumer Expenditure Survey indicate that riskier occupations, such as self-employed and salespersons, save less than people in other occupations do.

Finally, Shoven shows that there has been tremendous growth in the magnitude of nondividend cash payments by corporations in the past ten years. In the early 1970s, these payments amounted to roughly 15 percent of dividends. By 1984, they exceeded dividends, and in 1985 they amounted to \$120 billion, or almost 50 percent more than total dividends in the economy. Dividends per unit of equity have not fallen, though. Rather, the acquisition of equity has allowed firms to retain relatively constant debt-equity ratios in the past five years despite strong equity markets. Firms have chosen to absorb equity and to issue debt, holding leverage roughly constant, and have thus saved large amounts of taxes. Shoven estimates that the cost to the Treasury of treating share purchase payments differently from dividends was more than \$25 billion in 1985. He also finds that future corporate tax collections are significantly reduced by the resulting decline in corporate equity.

The following NBER researchers also participated in the meeting: B. Douglas Bernheim, Stanford University; Jeremy I. Bulow, University of Chicago; Geoffrey Carliner, NBER; Charles T. Clotfelter, Duke University; Daniel J. Frisch, U.S. Department of the Treasury; Lawrence H. Goulder, Jerry R. Green, and N. Gregory Mankiw, Harvard University; James R. Hines, Jr., and Andrei Shleifer, Princeton University; and Shlomo Yitzhaki, Hebrew University. Also attending were Thomas S. Neubig, U.S. Department of the Treasury; and Alvin Warren and Bernard Wolfman, Harvard Law School.



## Labor Program Meets

About 40 members and guests of NBER's Program in Labor Studies met at the Bureau's Cambridge office on October 31. John M. Abowd, NBER and Princeton University, organized the day-long event at which the following papers were discussed:

Lisa M. Lynch, NBER and MIT, "The Youth Labor Market in the 1980s: Determinants of Reemployment Probabilities for Young Men and Women" (NBER Working Paper No. 2021)

Harry J. Holzer, NBER and Michigan State University, "Unemployment and Vacancy Rates Across Local Labor Markets"

Kevin Lang and Shulamit Kahn, University of California, Irvine, "Constraints on the Choice of Work Hours"

Katharine G. Abraham, Brookings Institution and MIT, "Flexible Staffing Arrangements: Theory and Some New Evidence"

Victor R. Fuchs, NBER and Stanford University, and Joyce Jacobsen, Stanford University, "Employee Response to Short-Time Compensation" (NBER Working Paper No. 2089)

In her paper, Lynch asks what determines whether a young worker in the United States will find a new job after not working or not seeking work (a state called "nonemployment") for a time. Using data from the new National Longitudinal Survey, she finds that the experiences of whites and nonwhites, and of men and women, are quite different. Also, high school dropouts have more difficulty in the labor market than those who stay in school longer or receive other types of training. Finally, Lynch finds that local demand conditions strongly influence how long a youth is nonemployed. Further, the less time out of work, the higher is the probability of being reemployed for both young men and young women.

Holzer analyzes vacancies at the firm level and in local labor markets to try to differentiate frictional or structural unemployment from unemployment caused by demand deficiencies. He finds that variation in vacancy rates at the local level accounted for one-third to one-half the employment differences across areas in 1980, when cyclical factors were relatively weak, and for most of the increase in unemployment between 1980 and 1982. There is also a great deal of variation across firms and within local markets. Job-specific characteristics (such as starting wages and the education level of new employees), turnover rates at the firm, and employment growth within the firm are all important influences on this variation. In particular, firms with more rapid growth in employment or sales experience longer duration of vacancies, indicating difficulty in hiring for such firms.

Lang and Kahn explore the nature of constraints on hours worked and their relationship to long-term em-

ployment contracts. They show that 40-45 percent of prime-age wage earners would like to work more, and fewer than 5 percent would like to work less (even if that meant earning less money). Moreover, they find no evidence that the tendency to want more work increases with seniority.

Abraham studies flexible staffing arrangements: the use of agency temporaries, short-term hires, and on-call workers. She finds that almost all U.S. employers use some flexible staffing arrangements and that for the average employer flexible staffers add the equivalent of 1.4 percent to the year-round work force over the year but add as much as 20 percent at some organizations. Demand variability and "blips" in regular employees' labor supply (vacations, absences, unexpected quits, and so on) appear to be the main reasons for using flexible staffers. Of employers responding to the survey, 85 percent reported their use of flexible staffing arrangements to be either "very" or "somewhat" important in helping to absorb fluctuations in their organizations' workloads.

Finally, Fuchs and Jacobsen's paper reports on a survey of employees at a firm that implemented 10 percent reductions in hours and pay for six months in 1985. They find that the propensity to come to work even with these reductions rises with income and education and falls with age. Time spent working at home rises for employees with children at home. Employee reaction to the program was most positive among married women and least positive for married men. The generally positive reaction to the program suggests that other firms might consider short-time work as an alternative to layoffs.

## Program Meeting on Financial Markets and Monetary Economics

NBER's Program in Financial Markets and Monetary Economics, directed by Benjamin M. Friedman of Harvard University, met in Cambridge on November 7. The following papers were discussed:

N. Gregory Mankiw, NBER and Harvard University; Jeffrey A. Miron, NBER and University of Michigan; and David Weil, Harvard University, "The Adjustment of Expectations to a Change in Regime: A Study of the Founding of the Federal Reserve" Discussant: Angelo Melino, NBER and University of Toronto

Herschel I. Grossman, NBER and Brown University; and Behzad T. Diba, Brown University, "Market

Fundamentals, Rational Bubbles, and the Stationarity Properties of Stock Prices”

Discussant: John Y. Campbell, NBER and Princeton University

Andrew W. Lo, NBER and University of Pennsylvania; and Craig MacKinlay, University of Pennsylvania, “Stock Prices Do Not Follow Random Walks: Evidence from a New Specification Test”

Discussant: Robert J. Shiller, NBER and Yale University

Stephen J. Turnovsky, NBER and University of Illinois, “Supply Shocks and Optimal Monetary Policy” (NBER Working Paper No. 1988)

Discussant: Matthew D. Shapiro, NBER and Yale University

Laurence J. Kotlikoff, NBER and Boston University (coauthors Torsten Persson and Lars E. O. Svensson), “Laws As Assets: A Solution to the Time-Consistency Problem” (NBER Working Paper No. 2068)

Laurence J. Kotlikoff. “Is Debt Neutral in the Life-Cycle Model?” (NBER Working Paper No. 2053)

Discussants: Alberto Alesina, Harvard University; and Philippe Weil, NBER and Harvard University

Mankiw, Miron, and Weil use data on the term structure of interest rates to examine how quickly expectations responded to the founding of the Federal Reserve in 1914. They show that both the stochastic process for short rates and the relationship between long and short rates changed rapidly. Since the relationship between long and short rates depends on the perception of the policy regime, this finding indicates that expectations adjusted quickly to the new regime in this instance.

Grossman and Diba report empirical tests of a simple model of stock prices that defines stock prices as the sum of an unobservable variable and the expected present value of dividends, discounted at a constant rate. The model also defines a rational bubble to be a self-confirming divergence of stock prices from market fundamentals in response to extraneous variables. Although their specification of market fundamentals does not explain fluctuations of stock prices, they do not find evidence of the existence of rational bubbles.

Lo and MacKinlay test the random walk hypothesis of stock prices and find, first, that weekly stock return indexes depart significantly from the random walk model and, second, that such departures are caused primarily by the behavior of small stocks. Moreover, their empirical results indicate that weekly returns are significantly and positively autocorrelated. Although other studies have uncovered negative serial correlation in returns over long holding periods (three to five years), Lo and MacKinlay’s findings suggest that a simple model of stock prices cannot fully capture the stochastic properties evident in the data. As an alternative, they suggest a nonstationary process for stock prices that matches the actual behavior of market returns more closely.

Turnovsky demonstrates that if current shocks are observed simultaneously, output can be stabilized perfectly for completely general supply disturbances, using simple monetary policy rules based on: the current shock; the previous forecast of the current shock; and the forecast for just one period ahead. The optimal policy rule can be expressed in an infinite number of ways and the paper considers various alternatives. With optimal wage indexation, the monetary rule is even simpler. If current shocks are not observed simultaneously, but are inferred from other signals, then the optimal rules are of the same form, with the current perceived disturbance replacing the actual one.

The two papers presented by Kotlikoff are described in “Tax Program Meets in Cambridge” in this issue of the *NBER Reporter*.

Also attending this meeting were NBER associates: Robert B. Barsky, University of Michigan; Olivier J. Blanchard, MIT; Jeremy I. Bulow, University of Chicago; R. Glenn Hubbard, Northwestern University; Takatoshi Ito, University of Minnesota; Alex Kane and Alan J. Marcus, Boston University; Bruce N. Lehmann, Columbia University; Terry A. Marsh, Stanford University; Andrei Shleifer, Princeton University; and Lawrence H. Summers, Harvard University. Other participants were: Sumru Altug, University of Minnesota; Geoffrey Carliner, NBER; and J. Bradford DeLong, Kenneth Kuttner, and David Laibson, Harvard University.

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753. “Debt Policy and the Rate of Return Premium to Leverage,” by Alex Kane, Alan J. Marcus, and Robert L. McDonald, 1985 (NBER Working Paper No. 1439)

754. “Capital Mobility in the World Economy: Theory and Measurement,” by Maurice Obstfeld, 1986 (NBER Working Paper No. 1692)

755. "The Deductibility of State and Local Taxes: Impact Effects by State and Income Class," by Daniel R. Feenberg and Harvey S. Rosen, 1986 (NBER Working Paper No. 1768)
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61. "Granger-Causality and Policy Ineffectiveness: A Rejoinder," by Willem H. Buiter, October 1986 (JEL Nos. 130, 211)

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## Study of Developing Countries Published

*Economic Adjustment and Exchange Rates in Developing Countries*, edited by Sebastian Edwards and Liaquat Ahamed, is now available from the University of Chicago Press for \$48.00. This NBER volume includes 11 papers and discussions presented at a 1984 conference on exchange rates.

The topics range from the role of devaluations in stabilization programs to exchange rate policies in Western Africa. The book also includes discussions of the use of multiple exchange rates, contractionary devaluations, and the role of exchange rate policy during a liberalization reform. Finally, there are case studies on Colombia, Greece, and Kenya.

While the papers were written by academic economists, each was commented on by at least one policy expert, typically from the World Bank or the International Monetary Fund. Therefore, readers will be able to compare the ways in which academic economists and practitioners view a particular problem, and the book should be of interest to a fairly wide audience.

Edwards is a faculty research fellow in NBER's international studies program. He is also an associate professor of economics at the University of California at Los Angeles. Ahamed is a senior investment officer at the World Bank.

## Volume on Economic History Available

*Long-Term Factors in American Economic Growth*, edited by Stanley L. Engerman and Robert E. Gallman, is now available from the University of Chicago Press. The price of the book is \$79.95.

This NBER volume includes 15 papers presented at a 1984 Conference on Research in Income and Wealth and represents a major step toward understanding the sources of economic growth. The papers focus on economic change in the United States, Canada, and the British Caribbean during the 19th and 20th centuries, and cover such topics as: new estimates of Canadian national income after 1870; the growth and sectorial composition of the U.S. capital stock in the 19th century; the changing role of women in the U.S. labor force; and the measurement of state and local government expenditures for nearly two centuries. Many of the analyses use primary sources on population and human development never before analyzed. Therefore, the work should be of particular interest to scholars of American economic history and of growth and development in general.

Engerman and Gallman are research associates in NBER's Program in Development of the American Economy. Engerman is a professor of economics and history at the University of Rochester. Gallman is a professor of economics and history at the University of North Carolina, Chapel Hill.

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*Journal of Economic Literature* (JEL) subject codes, when available, are listed after the date of the Working

Paper. Abstracts of all Working Papers issued since October 1986 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.

## **Investment, Tobin's Q, and Multiple Capital Inputs**

**Robert S. Chirinko**  
Working Paper No. 2033  
October 1986  
JEL No. 130

Despite their solid theoretical basis, models of business investment based on Tobin's Q theory have performed disappointingly in general. This paper examines one possible source of misspecification. When the firm's technology is expanded to include two or more capital inputs, the investment equation that follows from maximizing behavior includes Q and a series of additional explanatory variables. This paper assesses the importance of these omitted variables, and the econometric evidence is mixed. The Multicapital Q model clearly dominates the Conventional specification, but empirical problems remain. In addition, this paper notes the implications for tax policy of the parameter estimates from the Conventional and Multicapital models.

## **Fiscal Increasing Returns, Hysteresis, Real Wages, and Unemployment**

**Olivier J. Blanchard and Lawrence H. Summers**  
Working Paper No. 2034  
October 1986

European unemployment is widely regarded as a problem of excessive real wages. This view, as it is usually expressed, carries the disturbing implication that there is a sharp conflict between the interests of those currently employed and the unemployed; it suggests that increases in employment will require reductions in the real wages of those currently employed.

The first part of this paper shows that increases in employment in Europe are likely to be associated with rising real take-home pay for current workers because of *fiscal increasing returns*. Increases in employment and output will make possible reductions in taxes that are large enough to offset any effects of diminishing returns to labor.

The second part of the paper considers alternative explanations for the failure of nominal wages to adjust so as to restore full employment; it also examines the implications of those explanations for the efficacy of fiscal policies. We conclude that, under a variety of plausible conditions, tax cuts would succeed in stimulating employment.

## **Hysteresis in Unemployment**

**Olivier J. Blanchard and Lawrence H. Summers**  
Working Paper No. 2035  
October 1986

The recent European experience of high, persistent unemployment has led to the development of theories of "unemployment hysteresis" that embody the idea that the equilibrium unemployment rate depends on the history of the actual unemployment rate. This paper summarizes two directions for research on hysteresis that appear especially promising. The first, a group of membership theories, is based on the distinction between insiders and outsiders. These theories explore the idea that wage setting is largely determined by firms' incumbent workers rather than by the unemployed. The second direction, a group of duration theories, explores the idea that the long-term unemployed exert much less downward pressure on wages than do the short-term unemployed.

## **Pensions, Unions, and Implicit Contracts**

**Alan L. Gustman and Thomas L. Steinmeier**  
Working Paper No. 2036  
October 1986  
JEL Nos. 820, 830

This paper analyzes the relationship of pension coverage and key plan characteristics to measures of union membership and strength, and to related interactions. The large and significant relationships that we find cannot be explained by, and are often inconsistent with, predictions obtained by extending the major explanations for the existence of pensions to allow for union monopoly effects. The findings support some (but not other) explanations in which the impetus for pensions arises more directly from the behavior of unions. The findings also suggest that behavioral and related policy analyses of pensions should be conducted separately for the union and nonunion sectors.

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## **Wages, Employment, Training, and Job Attachment in Low-Wage Labor Markets for Women**

**Alan L. Gustman and Thomas L. Steinmeier**

Working Paper No. 2037

October 1986

JEL Nos. 810, 820

This paper analyzes economic behavior and the effects of training and income support policies in the low-wage market for women. It takes account of nonlinearities and discontinuities that are associated with career interruption, part-time work, and government programs. There are two sectors: one rewards training and individual ability; the other does not and offers only the minimum wage. Effects of policies vary importantly among heterogeneous groups of women according to ability and taste for children and household work. We present some preliminary empirical evidence to narrow the choice of specification.

## **International Oligopoly and Asymmetric Labor Market Institutions**

**James A. Brander and Barbara J. Spencer**

Working Paper No. 2038

October 1986

JEL No. 410

Asymmetries in labor relations can have important effects on imperfectly competitive rivalries between firms. Such asymmetries are particularly striking in cross-country comparisons and are therefore of greatest interest in international markets. Using a simple duopoly model, we focus on two asymmetries. First, one firm may face a noncooperative union. Second, institutional factors may allow one firm to commit itself to particular labor input before its rival sets output, giving it a natural Stackelberg leadership role. We examine the trade policy incentives resulting from these labor asymmetries, focusing on profit-sharing tariffs, quotas, and subsidies.

## **Seniority Rules and the Gains from Union Organization**

**Joseph S. Tracy**

Working Paper No. 2039

October 1986

This paper examines the optimality of several seniority provisions that are common to U.S. union contracts.

I focus on the attempts by the initial members of the union to maximize their return from organizing the union. Using an overlapping-generations model, I find that seniority wage increases serve as implicit initiation fees. Thus they are one means of appropriating rents from future union members. Layoff rules are optimal only when the organizers are constrained in the types of contracts they can write. Without such constraints, the optimal contract provides full insurance and makes layoff rules unnecessary. I conclude with a plausible set of constraints that organizers may face, and I discuss the conditions necessary for seniority layoff rules to result.

## **The Importance of Local Fiscal Conditions in Analyzing Local Labor Markets**

**Joseph Gyourko and Joseph S. Tracy**

Working Paper No. 2040

October 1986

This paper proposes a new test of the compensating wage differential model. We extend the logic behind Roback's model, and we show how differences in non-produced amenities may be reflected in intercity wage differentials, to the case of differences in local fiscal conditions, represented by tax rates and publicly produced services. We find that differences in local tax rates and provision of services generate compensating wage differentials across cities. We then examine the effects of a particularly large set of taxes and effective services output measures.

## **Final Prerequisites for a Viable Managed Exchange Rate Regime: A Nontechnical Eclectic Introduction**

**Willem H. Buiter**

Working Paper No. 2041

October 1986

This paper first reviews the budget identities of the fiscal and monetary authorities and the solvency constraint, or present-value budget constraint, of the consolidated public sector for closed and open economies. It then discusses the new conventional wisdom concerning the fiscal roots of inflation.

Sargent and Wallace's popular rational expectations "Unpleasant Monetarist Arithmetic" model has ambiguous implications for inflation from an increase in the fundamental deficit. It is also incapable of generating hyperinflation. The only runaway, explosive, or unstable behavior it can exhibit is "hyperdeflation." In the

open economy, the need to maintain a managed exchange rate regime does not impose any constraint on the growth rate of domestic credit that arises through the government's need to remain solvent. Therefore, Obstfeld's proposition to the contrary is caused by the omission of government bonds and borrowing.

So far there is no "deep structural" theory that justifies the (exogenous) lower bounds on the stock of foreign exchange reserves as is characteristic of the literature on collapsing exchange rates. Without such a theory of "international liquidity," one cannot satisfactorily model a foreign exchange crisis that is not a government solvency crisis at the same time. Given such a lower bound, the existence (or absence) of a pecuniary opportunity cost to holding reserves conditions the fiscal and financial actions consistent with prolonged survival of the managed exchange rate regime.

### **Optimal Monetary Policy and Wage Indexation under Alternative Disturbances and Information Structures**

**Stephen J. Turnovsky**  
Working Paper No. 2042  
October 1986

This paper analyzes the interdependence between the optimal degree of wage indexation and optimal monetary policy for a small open economy under a variety of assumptions about the relative information available to private agents and the stabilization authority and the perceived nature of the disturbances impinging on the economy. It emphasizes the distinctions between unanticipated and anticipated disturbances, and permanent and transitory disturbances. The extent to which stabilization is achieved depends on the nature of the disturbances and the available information. I emphasize the policy redundancy issue, implying that optimal rules frequently can be specified in many equivalent ways.

### **International Capital Mobility in Developing Countries versus Industrial Countries: What Do Saving-Investment Correlations Tell Us?**

**Jeffrey A. Frankel, Michael Dooley,**  
and **Donald Mathieson**  
Working Paper No. 2043  
October 1986  
JEL Nos. 441, 430

Feldstein and Horioka's (1980) finding that countries' investment rates are highly correlated with their

national saving rates has been confirmed by now by many subsequent studies. However, their inference that international capital mobility must be low has not been as widely accepted. This paper examines the statistical relationship between national saving and investment in a sample of 14 industrialized countries and 50 developing countries. The paper addresses some of the econometric critiques that have been aimed at the Feldstein-Horioka work. Contrary to what one would expect from consideration of capital mobility, the coefficient appears higher for industrialized countries than for developing countries, and higher after 1973 than before.

Our interpretation of the saving-investment evidence is that the data do not support the hypothesis of a high degree of substitutability for claims on physical capital located in different countries. International substitutability for financial capital may be high, but this is a separate condition (which is properly tested by looking directly at rates of return). High international substitutability for bonds would imply high international substitutability for physical capital if capital were perfectly substitutable for bonds within each country. There is no reason for this to hold, any more than there is a reason for all goods to be perfect substitutes.

### **Empirical Structural Evidence on Wages, Prices, and Employment in the United States**

**Olivier J. Blanchard**  
Working Paper No. 2044  
October 1986  
JEL No. 130

In this paper, I investigate the dynamics of U.S. post-war prices, wages, and employment by identifying and estimating a price and a wage equation. I reach two main conclusions: First, nominal wages adjust faster to prices than prices do to nominal wages. This may be taken as evidence that price inertia is more important empirically than nominal wage inertia is.

Second, the effect on wage inflation of a permanent increase in unemployment, if prices do not change, is largely temporary. This can be interpreted in various ways. If the wage equation is interpreted as a Phillips curve, for example, both the rate of change and the level of unemployment play an important role in wage determination.

The methodology of this paper is somewhat different from the traditional approach to the estimation of price and wage equations. Its spirit is to impose on the reduced form a just-identifying set of restrictions. In this way, the methodology makes a structural interpretation possible, while the data are left free to speak.

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## Alternative Liberalization Strategies

**Robert E. Baldwin**

Working Paper No. 2045

October 1986

JEL No. 421

This paper examines various strategies that have been proposed for halting the recent drift toward protectionism and restoring a more liberal trading regime. A number of groups and individuals propose a multilateral approach aimed at immediately reducing all forms of import barriers and export subsidies on a nondiscriminatory basis across all commodities. Others, who doubt that all major countries are prepared at this time to pursue this approach, favor a bilateral and regional strategy in which those countries willing to liberalize conclude agreements that are left open for others to join. They believe that this approach will eventually lead to multilateral liberalization. Some groups believe that neither of these approaches will succeed and that an aggressive strategy of quickly retaliating against the unfair trade practices of other countries is the best way to bring countries to the bargaining table for multilateral negotiations.

This paper considers the merits and problems of these various strategies as well as their prospects for implementation. It also discusses the importance of other conditions necessary for trade liberalization, such as satisfactory domestic and international macroeconomic conditions.

## Capital Accumulation and Annuities in an Adverse-Selection Economy

**Dan Peled and Martin S. Eichenbaum**

Working Paper No. 2046

October 1986

JEL No. 313

This paper suggests that adverse-selection problems in competitive annuity markets can generate quantity-constrained equilibria in which some agents whose length of lifetime is uncertain find it advantageous to accumulate capital privately. This occurs despite the higher rates of return on annuities. We analyze the welfare properties of these allocations. We also show that the level of capital accumulation is excessive in a Paretian sense. Finally, we discuss policies that eliminate this inefficiency.

## Why Don't the Prices of Stocks and Bonds Move Together?

**Robert B. Barsky**

Working Paper No. 2047

October 1986

The very low real interest rates on bonds in the 1970s were accompanied by a large drop in the value of common stocks relative to dividends and earnings. More generally, a number of authors have demonstrated that the real prices of debt and equity claims do not covary closely and often move in opposite directions. This paper analyzes the effects of two disturbances—an increase in risk, and a slowing of productivity growth—each of which might rationalize a simultaneous drop in equity values and in real interest rates on bonds.

As long as marginal utility is a convex function of consumption, an increase in risk depresses the return on riskless bonds. When all of the wealth of the economy is traded in the stock market, equity values fall with increasing equity risk only if the intertemporal elasticity of substitution in consumption exceeds unity. This same pattern occurs in response to a fall in productivity growth. In a richer model with two real assets, which takes account of the fact that corporate capital has rarely been more than one-quarter of total wealth, it is likely that both increased risk and lower productivity growth in the corporate sector lead to a fall in stock prices, a drop in real interest rates, and a rise in the price of the second tangible asset. This was the pattern seen in the 1970s.

## The Intradaily Exchange Rate Dynamics and Monetary Policies After the G-5 Agreement

**Takatoshi Ito**

Working Paper No. 2048

October 1986

JEL No. 431

This paper investigates the determinants of yen appreciation from the G-5 agreement of September 1985 to the end of May 1986. I identify four waves of appreciation separated by calm periods during that time. For each wave and calm period, I decompose the changes in the yen/dollar exchange rate into those that took place in the Tokyo, Europe, and New York markets. In addition, I study correlations among the yen, mark, and pound for each market during each wave.

I find that the surprisingly strong effect of the G-5 agreement on the exchange rate was caused by the signaled change in U.S. policy. The role of direct intervention by the Bank of Japan was rather limited at that point.



The Bank of Japan adopted the "high-interest policy" in October 1985. By narrowing the interest rate gap between Japan and the United States, the Bank of Japan successfully created another round of appreciation.

A major cause of the third wave of yen appreciation that began on January 24, 1986, was the decline in oil prices. After the third wave was over, the Bank of Japan started intervening in the market in support of the dollar—a reversal of direction. However, the effort did not succeed in stopping another round of yen appreciation. That fourth wave of appreciation in the middle of April was caused by mixed prospects for reducing U.S. federal deficits and for a further decline in oil prices.

These findings are consistent with a view that exchange rates respond mainly to news of fundamentals and that they are not manageable by coordinated interventions alone.

## **Location Decisions of New Immigrants to the United States**

**Ann P. Bartel**

Working Paper No. 2049

October 1986

JEL No. 823

This paper estimates a multinomial logit model of the location decisions of new immigrants to the United States. I use data from the 5 percent Public Use Samples of the 1970 and 1980 Censuses of Population to study the geographic distribution of immigrants who arrived after 1965.

I find, first, that in choosing both initial and subsequent locations, immigrants are considerably more concentrated geographically than are native Americans who move to a new city. Moreover, all of the immigrant groups I study prefer to live in cities where their countrymen are already located, but this relationship is much weaker for the more educated immigrants.

Third, evidence on the question of whether immigrants learn about economic opportunities as they spend time in this country is ambiguous. On the one hand, with the exception of Mexicans, distance from the home country has a much weaker negative impact on location choice as time in the United States elapses. On the other hand, the expected wage variable, which should have a larger positive effect over time, does only for Asians and, to some extent, Central and South Americans (excluding Mexicans and Cubans).

Finally, within each ethnic group, there are significant differences in the location choice of the 1965–9 and 1975–9 immigrant cohorts. The results are consistent with an increase over time in the quality of Asian immigrants, and a decrease in the quality of Mexican, Cuban, and European immigrants.

## **Investment and Sales: Some Empirical Evidence**

**Andrew B. Abel and Olivier J. Blanchard**

Working Paper No. 2050

October 1986

JEL No. 130

This paper attempts to give a structural interpretation to the distributed lag of sales on investment at the two-digit level in U.S. manufacturing. It first presents a simple model that captures the various sources of lags and their respective implications. It then estimates the model, using both data on investment and sales and direct evidence on the sources of lags. The spirit of the paper is exploratory; it uses the model mainly as a vehicle to construct, present, and interpret the data.

We find that this model roughly generates the distributed lag structure found in the data: Firms face delivery lags of three quarters. They also face adjustment costs, which lead them to take into account expected future sales with a discount factor of 0.9 when constructing the desired capital stock, and to close about 5 percent of the gap between actual and desired capital per quarter. They pay for orders at a constant rate between the time of order and that of delivery. However, the model is not very successful in explaining differences in dynamics across sectors.

## **The Competitiveness and Comparative Advantage of U.S. Multinationals, 1957–1983**

**Robert E. Lipsey and Irving B. Kravis**

Working Paper No. 2051

October 1986

JEL Nos. 421, 441

In world exports of manufactured goods, the share of U.S. multinational firms, including their majority-owned overseas affiliates, has been nearly stable since 1966. This stability, over a period in which the export share of the United States as a geographical entity was declining for the most part, suggests that it was not declines in the competitiveness of American firms' management and technology that were responsible for the deterioration of the U.S. trade position. That view is reinforced by the fact that a good deal of the change in U.S. export shares can be explained by changes in U.S. prices relative to those of other countries.

The comparative advantage of both the United States and U.S. multinational firms, especially the latter, has been in chemicals, machinery, and transport equipment, industries with relatively fast growth in worldwide exports. The growth of U.S. exports in 1966–77 fell far

short of what it would have been if the United States had retained its share in each industry. The growth of U.S. multinationals' exports fell a little short of that implied by constant shares but surpassed that of the United States as a country in almost every industry. After 1977, both the United States and its multinationals kept up with their constant-share growth rates and the United States even ran a bit ahead. The multinationals' position as exporters, now supplying almost half their exports from their majority-owned overseas affiliates, seems to have been quite insulated from changes in U.S. policies and circumstances.

## **New Evidence on the Effects of Exchange Rate Intervention**

**Martin Feldstein**

Working Paper No. 2052

October 1986

JEL No. 431

The September 1985 decision of the G-5 countries to pursue coordinated intervention has been widely credited with the subsequent sharp decline of the dollar relative to other major currencies. On the surface, the dollar's decline appears as evidence that coordinated intervention can be an effective instrument of economic policy, contrary to most of the previous economic analysis of this issue.

The evidence in this paper shows that such a conclusion is unwarranted. The dollar's decline in the nine months after the G-5 agreement was generally no faster than it had been since the beginning of its decline in the spring of 1985. The only indication of discontinuity in the overall behavior of the dollar was a drop of about 4 percent that occurred immediately after the G-5 meeting, and that has largely persisted.

Although this evidence cannot be taken as a conclusive indication that coordinated intervention had no effect on the dollar's rate of decline, it does show the inappropriateness of interpreting the dollar's decline after September 1985 as evidence that coordinated intervention was effective.

The special case of the Japanese yen is more ambiguous. Unlike all of the other G-5 currencies, the yen did appreciate more rapidly after the G-5 meeting than it did before. But, immediately after the G-5 meeting, the Japanese government was also unique in making a major shift in monetary policy to strengthen the yen. Moreover, the yen was the major currency that could be expected to appreciate most as a result of the massive and unexpected decline of the price of oil in the first half of 1986.

## **Is Debt Neutral in the Life-Cycle Model?**

**Laurence J. Kotlikoff**

Working Paper No. 2053

October 1986

JEL No. 320

This paper questions the widely accepted view that deficits have real effects in the life-cycle model. Standard analyses of deficits within life-cycle models treat the government as a dictatorial entity that can effect any intergenerational redistribution it desires. In contrast, this paper drops the assumption of compulsion and models the government as a coalition of self-interested young and old generations whose bargaining determines government decisions. Since each generation is selfish, no generation will voluntarily absorb the debts of another except as a quid pro quo for receiving particular goods or services. Hence redistribution per se between generations will not arise. Because each generation is ultimately responsible for its own liabilities, deficit finance, while altering the timing of tax receipts, has no economic impact.

## **A Test of International CAPM**

**Charles M. Engel and Anthony Rodrigues**

Working Paper No. 2054

October 1986

We propose and implement a test of the international capital asset pricing model (CAPM). We regress ex post asset returns on asset supplies. CAPM requires that the matrix of coefficients from a regression of  $n$  rates of returns on  $n$  asset supply shares be proportional to the covariance matrix of the residuals from those regressions. We test this restriction in the context of a model that aggregates all outside financial assets for each of ten countries. We do not find strong support for the restrictions of CAPM.

## **Management Ownership and Corporate Performance: An Empirical Analysis**

**Randall Mørck, Andrei Shleifer, and Robert Vishny**

Working Paper No. 2055

October 1986

JEL No. 521

We investigate the relationship between management ownership and corporate performance, as measured by Tobin's  $Q$ . In a cross section of *Fortune* 500 firms, Tobin's  $Q$  first increases and then declines as the holdings of boards of directors rise. For older firms, there is weak evidence that  $Q$  is lower when a firm is run by a member of the founding family than when it is run by an officer unrelated to the founder.

## **The Demand for Workers and Hours and the Effects of Job Security Policies: Theory and Evidence**

**Daniel S. Hamermesh**  
Working Paper No. 2056  
October 1986  
JEL Nos. 821, 824

There has been a wide variety of research on worker hours substitution and the effects of various costs on the speed and extent to which labor demand adjusts. Much of this literature, though, confuses various types of fixed costs and fails to provide a guide for identifying how changes in labor cost structures affect static relative demands for workers and hours and the paths by which they adjust. This study presents a typology of labor cost structures and examines how they affect these and other aspects of labor demand. Some of the many recently adopted changes in labor market policies in OECD countries are pigeonholed by their effects on labor costs.

A review of the evidence indicates clearly that there is some slight substitution between workers and hours along a constant effective labor isoquant. The evidence is clear that employers adjust the demand for hours more rapidly than that for workers, and that both adjust fairly rapidly. It also shows that a major effect of cost-increasing policies designed to induce substitution from hours to workers is a reduction in the total amount of worker hours demanded. Original analysis demonstrates that lags in the adjustment of employment in response to changes in demand lengthened in most OECD countries during the 1970s.

## **Business Cycles and Oligopoly Supergames: Some Empirical Evidence on Prices and Margins**

**Ian Domowitz, R. Glenn Hubbard,**  
and **Bruce C. Petersen**  
Working Paper No. 2057  
October 1986

There has been significant interest in applying supergames to oligopoly behavior on a theoretical level. Implications for pricing behavior of trigger-strategy models in response to aggregate demand are of particular importance for public policy considerations. We contrast the predictions for the movements of industry prices of two such models over the business cycle—put forth by Edward Green and Robert Porter and by

Julio Rotemberg and Garth Saloner—and test the predictions using a panel data set of U.S. manufacturing industries.

We have four principal findings. (1) The levels of price-cost margins of concentrated, homogeneous-goods industries, while higher than those of unconcentrated counterparts, appear to be closer to those predicted by a single-period Cournot-Nash equilibrium than to monopoly. (2) There is little evidence to support the idea that price-cost margins of these industries have cyclical patterns that are different from other industries apart from effects by level of industry concentration. (3) Maximum price declines for concentrated industries give little support for the occurrence of price wars during either recessions or booms. (4) Consistent with the predictions of the Rotemberg-Saloner model, the industries with high price-cost margins have more countercyclical price movements than those exhibited by other industries. However, the fact that gradual price adjustment is quantitatively important for those industries suggests that other factors may lie behind the apparent rigidity of prices.

## **Structural Change and Patterns of International Trade**

**Robert E. Baldwin**  
Working Paper No. 2058  
October 1986  
JEL No. 411

This paper focuses on economists' understanding of the basic determinants of trade patterns and, in particular, on the manner in which these underlying factors change over time and are affected by various policies. A brief survey contrasts the determinants of the structure of trade emphasized by the Ricardian, Heckscher-Ohlin, and imperfect-competition models and discusses how well the predictions of these various theories are supported by empirical evidence. The main conclusion of the survey is that trade economists have been reasonably successful in explaining the structure of trade at any given time but much less successful in understanding how the determinants of the patterns of trade change over time. This inability to explain how the basic determinants of the structure of trade change over time can lead to both poor predictions and bad policy advice.

Given the increased interest in long-term shifts in trading structures, I argue that trade economists should enlarge their analytical framework by endogenizing to a greater extent the basic economic factors determining these shifts. They must also recognize the endogenous nature of trade policies in their models if they are to carry out their predictive and evaluative roles in the best possible manner.

## **International Macroeconomic Policy Coordination When Policymakers Disagree on the Model**

**Jeffrey A. Frankel and Katharine Rockett**  
Working Paper No. 2059  
October 1986  
JEL No. 431

The literature on international macroeconomic policy coordination makes the unrealistic assumption that policymakers all know the true model. From this it generally follows that the Nash bargaining solution is superior to the Nash noncooperative solution.

Everything changes once we recognize that policymakers' models differ from each other and therefore differ from the "true" model. It is still true that, in general, the two countries will be able to agree on a cooperative policy package that each believes will improve the objective function relative to the Nash noncooperative solution. However, the bargaining solution is as likely to move the target variables in the wrong direction as in the right direction, in light of a third true model.

This paper illustrates these theoretical points with monetary and fiscal multipliers taken from simulations of eight leading international econometric models. (It is a sequel to NBER Working Paper No. 1925, which considered coordination between the domestic monetary and fiscal authorities.)

We first consider coordination between U.S. and non-U.S. central banks. We find that out of 512 possible combinations of models that could represent U.S. beliefs, non-U.S. beliefs, and the true model, coordination improves U.S. welfare in only 289 cases, reducing it in 206, and improves the welfare of other OECD countries in only 297 cases, reducing it in 198.

Then we consider coordination with both monetary and fiscal policy. We find that out of 512 combinations, coordination improves U.S. welfare in 183 cases, reducing it in 228, and improves the welfare of other OECD countries in 283 cases, reducing it in 219. The final section of the paper considers possible extensions of the framework, dealing with uncertainty.

## **Optimal Labor Contracts, Imperfect Competition, and Underemployment Equilibria: A Framework for Analysis**

**Russell Cooper**  
Working Paper No. 2060  
October 1986  
JEL No. 023

This paper examines the macroeconomic properties of imperfectly competitive economies. The focus is on

the coordination failures that might arise in these economies, a study of alternative policies, and the comparative static properties of these models. This paper differs from others in this area by modeling the labor market from the perspective of optimal contract theory. This permits an evaluation of the role of labor market behavior in producing these coordination failures and a study of labor market policies (such as unemployment insurance and alternative compensation schemes).

## **Debt Problems and Macroeconomic Policy**

**Lawrence H. Summers**  
Working Paper No. 2061  
October 1986

This paper examines the recent dramatic increase in the ratio of U.S. nonfinancial debt to GNP. It concludes that the increase is largely the result of federal budget deficits. There does not appear to have been a major change in traditional patterns of private sector borrowing in recent years. The excessive accumulation of federal debt probably threatens financial stability more than recent increases in private debt do.

## **The Effects of Fiscal Policies When Incomes Are Uncertain: A Contradiction to Ricardian Equivalence**

**Martin Feldstein**  
Working Paper No. 2062  
November 1986  
JEL Nos. 023, 323

This paper shows that when earnings are uncertain, the substitution of deficit finance for tax finance, or the introduction of an unfunded Social Security program, will raise consumption even if all bequests reflect intergenerational altruism. Thus, contrary to the theory developed by Barro and a number of subsequent writers, an operative bequest motive need not imply Ricardian equivalence.

Since there is no uncertainty in this analysis about the date of each individual's death, this conclusion does not depend on imperfections in annuity markets. Nor does it depend on the existence of other than lump-sum taxes and other distortions. Rather, it follows from the result derived in the paper that when an individual's future earnings are uncertain, his future bequest is also uncertain. His consumption therefore rises more in response to an increase in his current disposable income than to an equal present-value increase in the disposable income of his potential heirs.

## **Trends and Deviations in Federal, State, and Local Finance**

**Jeffrey S. Zax**

Working Paper No. 2063

November 1986

This paper contains a descriptive analysis of real per capita annual revenues, expenditures, deficits, debt level, and capital expenditures for federal, state, and local governments in the United States for 1952-83. It summarizes each time series as a deterministic trend and an ARIMA characterization of the deviations around trend. These summaries indicate that civilian capital outlays have been falling at an accelerating pace in all levels of government. Federal government expenditures and debt have been expanding at an accelerating rate. Local special districts also have been growing quadratically. State governments have had a continuing surplus of revenues over expenditures, and local governments have depended upon intergovernmental revenues to maintain balance between revenues and expenditures while reducing debt. Stochastic persistence has tended to increase at more disaggregated levels of government. Expenditures have tended to have longer lags than revenues.

## **The Economic Consequences of the Franc Poincaré**

**Barry J. Eichengreen and Charles Wyplosz**

Working Paper No. 2064

November 1986

JEL No. 400

In this paper, we reassess the cyclical performance of the French economy in the 1920s, focusing in particular on 1926-31 and on France's resistance to the Great Depression. France expanded rapidly after 1926 and, unlike the other leading industrial economies, resisted the onset of the Depression until 1931. We find strikingly little support for the conventional explanation for these events, which emphasizes an undervalued French franc and an export-led boom. While French exports as a share of GDP turned down as early as 1928, the economy continued to expand for several subsequent years. Investment, not exports, emerges as the proximate source of the French economy's resistance to the Great Depression. Fiscal policy emerges as the major determinant of the surge in French investment spending. Previous accounts have emphasized the role of monetary policy in determining the real and nominal rates ostensibly responsible for French economic fluctuations in the decade after 1921. In contrast, we argue for a more balanced view of the roles of monetary and fiscal policies in French macroeconomic fluctuations over that critical decade.

## **Fiscal Policies and Real Exchange Rates in the World Economy**

**Jacob A. Frenkel and Assaf Razin**

Working Paper No. 2065

November 1986

JEL Nos. 431, 320

This paper examines the effects of fiscal policies on the evolution of real rates of interest and real exchange rates in the interdependent world economy. We construct an analytical framework for examining in detail how these variables are influenced by government spending and by tax policies. The analytical framework uses a general equilibrium approach, highlighting the roles played by wealth effects and by temporal and intertemporal substitution effects. The general principle illustrated by the analysis of the dynamic effects of budget deficits is that the consequences of temporary tax policies stretch beyond the period during which they are in effect. The counterpart to these dynamic implications is the rise in the economy's external debt induced by the budget deficit that must be serviced into the indefinite future. By a series of examples, allowing for both distortionary and nondistortionary taxes and for various patterns of government spending, we show that the quantitative and qualitative effects of fiscal policies on real exchange rates, real interest rates, debt accumulation, and the like depend critically on the commodity composition of government spending and its intertemporal allocations on the one hand, and on the details of government debt issue and tax structure, including the timing of taxes and borrowing and the types of taxes used to finance the budget, on the other hand.

## **Forecasting Recessions under the Gramm-Rudman-Hollings Law**

**Geoffrey H. Moore and Victor Zarnowitz**

Working Paper No. 2066

November 1986

JEL No. 130

The targeted deficit reductions of the Gramm-Rudman-Hollings law are to be temporarily suspended in case of an official determination that real economic growth either has been less than 1 percent in the two most recent reported quarters or is projected to be less than zero in any two consecutive quarters over the next six. This amounts to a particular definition of recession. But business cycles are best identified by the consensus of movements in the principal economic aggregates. Not all recessions are associated with real GNP declining or growing less than 1 percent for two

successive quarters. Also, GNP estimates are subject to long sequences of revisions that are often large.

We show that, for these reasons, conditioning a suspension of deficit cuts upon specific changes in preliminary data for real GNP involves very long lags in recognizing recessions. The recessions would be largely over before they were ever identified. We also show that forecasts of real GNP, based on the consensus among groups of professional forecasters, can reduce these lags considerably. This is so despite the fact that early and accurate predictions of business cycle peaks are rare, and that false warnings occur.

## **A Specification Test for Speculative Bubbles**

**Kenneth D. West**

Working Paper No. 2067

November 1986

JEL Nos. 211, 521

There are two ways to estimate the set of parameters needed to calculate the expected present discounted value of a stream of dividends. One test for speculative bubbles, or fads, is to ask whether the two estimates are the same. When the test is applied to some annual U.S. stock market data, the data usually reject the (null) hypothesis of no bubbles. The test is of general interest, since it may be applied to a wide class of linear rational expectations models.

## **Laws As Assets: A Possible Solution to the Time-Consistency Problem**

**Laurence J. Kotlikoff, Torsten Persson,  
and Lars E. O. Svensson**

Working Paper No. 2068

November 1986

JEL No. 320

This paper presents a new solution to the time-consistency problem that seems capable of enforcing ex ante policy in a variety of settings in which other enforcement mechanisms do not work. The solution involves formulating a law, institution, or agreement that specifies the optimal ex ante policy and that can be sold by successive old generations to successive young generations. Each young generation pays for the law through taxes. Both old and young generations have an economic incentive to obey the law. For the old generation that owns the law, breaking it makes the law valueless, and the generation suffers a capital loss. For the young generation, the economic advantage of purchasing the existing law exceeds its cost as well as the economic gain from setting up the law.

## **Individual Taxpayer Response to 1982-1984 Tax Cuts with Implications for the Revenue-Maximizing Tax Rate**

**Lawrence B. Lindsey**

Working Paper No. 2069

December 1986

JEL No. 323

The Economic Recovery Tax Act of 1981 mandated a series of tax rate reductions for 1982-4. They represented the most significant changes in the tax rate structure in nearly two decades. This paper estimates the response of taxpayers to these cuts and uses the results to calculate the revenue-maximizing top tax rate for the personal income tax.

In the paper, I create a baseline income distribution to describe the expected level and distribution of income in the absence of tax changes. I then compare this baseline with actual tax return data to measure the change in taxpayer behavior. Throughout the study, I use NBER's TAXSIM model to perform the detailed microsimulations.

I find that at least one-sixth, and probably as much as one-quarter, of the revenue loss that can be ascribed to the 1981 changes in the tax law was offset by changes in taxpayer behavior from 1982-4. I conclude that, with the tax base of that period, federal income tax revenue would have been maximized at a tax rate of about 35 percent. Total income tax revenue would have been maximized at a total tax rate of 40 percent. The findings also suggest that personal income was as much as 2 percent higher on average than it otherwise would have been as a result of the behavioral response of taxpayers to lower tax rates.

## **Productivity, Wages, and Prices Inside and Outside of Manufacturing in the United States, Japan, and Europe**

**Robert J. Gordon**

Working Paper No. 2070

November 1986

JEL Nos. 134, 824

This paper studies the dynamic behavior of changes in productivity, wages, and prices. The results are based on a new data set that allows a consistent analysis of the aggregate economy, the manufacturing sector, and the nonmanufacturing sector. They are presented for the United States, Japan, and an aggregate called "Europe" consisting of 11 European economies.

The primary theme of the paper is that differences between Europe and the United States have been substantially exaggerated in recent work. Europe has neither greater flexibility of nominal wages nor more rigid

real wages than the United States does. Evidence that the United States exhibits more nominal rigidity is confined to manufacturing, while the U.S. aggregate and nonmanufacturing sectors display as much nominal wage flexibility as Europe does, and similar "output sacrifice ratios" as well. These results undermine the case frequently made against demand expansion in Europe on the ground that such a demand expansion would cause only extra inflation with no bonus of extra output as a result of a uniquely vertical European aggregate supply curve.

The analysis of real wages also yields new results. A consistent treatment of the income of the self-employed almost completely eliminates the secular uptrend in previously developed wage gap indexes for Japan and Europe between the 1960s and the 1980s. If anything, real wages in Europe and Japan were too flexible rather than too rigid, in the sense that much of the increase in wage gap indexes in Europe during 1968-70 and in Japan in 1973-4 can be interpreted as autonomous wage push. The component of increases in wage gap indexes to be attributed to a failure of real wages to respond to the post-1972 productivity growth slowdown is relatively minor.

The paper's analysis of productivity change confirms the real wage elasticity of labor input emphasized previously but shows that the response of productivity to changes in the real wage, and to cyclical output fluctuations, is roughly the same in the United States, Japan, and Europe. The cyclical analysis allows an estimate of trend productivity growth, revealing interesting differences between the manufacturing and nonmanufacturing sectors in the three economies.

## **Exchange Rate Economics: 1986**

**Rudiger Dornbusch**  
Working Paper No. 2071  
November 1986  
JEL No. 430

In the past 15 years, key exchange rates have moved in larger and more persistent ways than advocates of flexible rates in the late 1960s would have left anyone free to imagine. Certainly there was no expectation of constancy for nominal exchange rates. But real exchange rate movements of 30 or 40 percent were definitely not suggested as a realistic possibility. Moreover, where these large movements did occur, they did not obviously appear to be connected with fundamentals and hence seemed difficult to explain in terms of the exchange rate theories at hand. The persistence of rate movements was as surprising as the rapid unwinding of apparent misalignments when they did ultimately occur.

The past 15 years provide a natural dividing line between the Keynesian and the monetary approaches of the 1960s, and the more recent analysis that takes into account exchange rate expectations and portfolio issues, which took off in the early 1970s, as well as the brand new approaches that concentrate on (partial equilibrium) microeconomics. To review these ideas, the paper starts with a brief look at the U.S. experience with flexible exchange rates. From there it proceeds to the Mundell-Fleming model as a comprehensive framework of analysis. The following sections deal with persistent effects of policy disturbances, links between exchange rates and prices, the political economy of exchange rate movements, and the question of policies toward excess capital mobility.

## **Increasing Indebtedness and Financial Stability in the United States**

**Benjamin M. Friedman**  
Working Paper No. 2072  
November 1986  
JEL No. 311

The outstanding indebtedness of U.S. nonfinancial borrowers, in comparison to U.S. economic activity, has risen since 1980 to a level that is extraordinary in comparison with prior historical experience. Approximately one-half of this rise has consisted of increased indebtedness (relative to income) of borrowers in the economy's private sector, including both individuals and businesses. It therefore represents, at least potentially, an increase in the economywide exposure to debt default.

The U.S. household sector as a whole has increased its holdings of liquid and other readily marketable assets in pace with its increased indebtedness, so that in the aggregate its balance sheet is no less sound than before. Available data make it doubtful, however, that the distribution of the additional assets matches the distribution of the additional debt closely enough to avoid household debt service problems in the event of a general economic contraction. In the case of the U.S. business sector, and especially nonfinancial corporations, there are no additional assets to match the additional liabilities. Hence business balance sheets as well as business incomes have become much more leveraged.

The chief implication of this increased private indebtedness is not only that the U.S. economy is likely to be more prone to financial instability in the event of a major business contraction, but also—and perhaps more importantly—that U.S. economic policymakers are therefore likely to be more reluctant either to seek or to tolerate a business recession in the first place.

Experience suggests that it will be difficult to balance the desire to avoid economic downturns with the ability to avoid occasional periods of excess aggregate demand. Hence this increased reluctance to tolerate recessions probably implies a more expansionary monetary policy on average than would otherwise be the case. Experience also suggests that a plausible result of such a no-recession monetary policy, sustained over time, is price inflation. This process is self-limiting, however, in that over time inflation would reduce the real value of the private sector's outstanding nominal indebtedness, thereby reducing the risk of financial instability, and ultimately removing the source of policymakers' increased reluctance to tolerate recessions.

## **The Bolivian Hyperinflation and Stabilization**

**Jeffrey D. Sachs**

Working Paper No. 2073

November 1986

JEL No. 134

The inflation in Bolivia during 1984-5 was the most rapid in Latin American history, and one of the highest in world history. During the first half of 1985, the inflation reached an annual rate of 26,000 percent. Following a stabilization program introduced in August 1985, the hyperinflation was quickly ended; inflation from February 1986 to October 1986 held to an annual rate of about 25 percent. The Bolivian experience sheds light on many of the perennial controversies in the discussions of hyperinflation, including the role of budget deficits versus balance-of-payments deficits in generating hyperinflations; the importance of a "regime change" for a shift from hyperinflation to price stability; and the role for price controls in a stabilization package.

## **The Global Velocity Curve, 1952-1982**

**Michael D. Bordo and Lars Jonung**

Working Paper No. 2074

November 1986

JEL No. 311

This paper provides evidence of and an explanation for an empirical regularity in the income velocity of money. Based on a cross-country comparison of 84 countries arrayed from very low to very high per capita income in the post-World War II period, velocity displays a U-shaped pattern. This pattern is very similar to

one observed by the authors in an earlier study for a number of advanced countries and a period of more than 100 years.

The U-shaped pattern of velocity is explained by institutional factors. On a secular basis, the downward trend in velocity is caused by a process of monetization, while the upward trend is explained by financial development. On a cross-country basis, industrialized countries with well-developed financial systems should generally display a rising trend in velocity, while poor countries at an earlier stage of economic growth should have falling trends as a rule. Velocity in economies "in between" should exhibit a fairly flat pattern with a weak positive or negative trend.

## **How Integrated Are World Capital Markets? Some New Tests**

**Maurice Obstfeld**

Working Paper No. 2075

November 1986

JEL No. 431

This paper presents some new empirical evidence on the extent of integration in the world capital market. The first set of tests uses data from different countries to compare internationally expected marginal rates of substitution between consumption on different dates. If residents of different countries have access to a nominally risk-free bond denominated in dollars, say, their common expected marginal rate of substitution of future for present dollars should equal the gross nominal return on dollar bonds. Tests of the international equality of expected marginal substitution rates yield evidence consistent with a substantial degree of international capital market integration after, but not before, 1973. These tests are naturally based on a particular model of intertemporal consumption choice, but direct estimation of the intercountry relationships implied by that model lends support to its assumptions. These last findings are relevant to the current debate in macroeconomics about the role of intertemporal substitution. The second set of tests conducted in this paper concerns correlations between countries' saving and investment rates. For a sample of ten countries, correlations between annual changes in saving and investment rates over 1948-84 look quite similar to those found in quarterly data. Surprisingly, however, the correlation coefficients are often lower before the mid-1960s than afterward. This finding throws further doubt on the interpretation of saving-investment correlation coefficients as structural parameters reflecting the response of domestic investment to shifts in national saving.



## **International Debt Service and Economic Growth: Some Simple Analytics**

**Martin Feldstein**

Working Paper No. 2076

November 1986

JEL Nos. 121, 440

Any arrangement that is to serve as a long-term framework for international debt management must permit a politically acceptable rate of economic growth in the debtor countries while gradually improving the financial positions of the creditor banks. In addition, a realistic debt management strategy must maintain enough new lending to the debtor countries to provide an incentive for continued compliance with debt service responsibilities.

This paper establishes the conditions under which these three goals are compatible. The analysis indicates that Argentina, Brazil, and Mexico are now all capable of achieving significant rates of economic growth without debt write-downs or interest rate reductions. They do require additional amounts of credit, but the resulting increases in the absolute size of their debts is compatible with declining ratios of debt to their own exports and to the total earnings of the creditor banks. Stated differently, limiting the ratio of debt service payments to GNP to country-specific standards, whether by long-term agreements or by annual negotiations, can achieve economic growth while improving the financial conditions of the creditor banks.

## **International Finance**

**Maurice Obstfeld**

Working Paper No. 2077

November 1986

JEL No. 431

This essay provides a selective and interpretive account of the development of thought on international financial questions. There is a focus on the process of international adjustment and on the proper definition of external balance. Since the first descriptions of the price-specie flow mechanism in Hume's time, the definition of external balance has evolved in response to changes in the world economy's structure. The foreign reserve constraint so central under the gold standard, or in the early Bretton Woods years, is less important under conditions of high international capital mobility. Increasingly, the current account and the national intertemporal budget constraint are emphasized in discussions of international adjustment. Analogous with the idea of a high-employment government budget surplus, a working definition of external balance might

be a current account that maintains the highest possible steady consumption level consistent with the economy's expected intertemporal budget constraint. Intertemporal approaches to external balance become more difficult to apply when countries face credit rationing as a result of nonrepayment risk.

## **Contractionary Devaluation and Dynamic Adjustment of Exports and Wages**

**Felipe Larrain and Jeffrey D. Sachs**

Working Paper No. 2078

November 1986

JEL Nos. 430, 431

Recent macroeconomic models of developing countries have emphasized the possibility of contractionary devaluations, stressing that domestic aggregate demand is likely to be reduced by the devaluations while aggregate supply may respond only slowly to the change in relative prices brought about by the devaluation. These results have been obtained in static models. In this paper, we add wage and export-sector dynamics to the models of contractionary devaluation and show that the effects that produce contractionary devaluations in the short term can produce limit cycles in the long run. The economy never returns to long-run equilibrium following a devaluation, but rather moves with fixed periodicity through successive phases of boom and bust.

## **Why Did the Bank of Canada Emerge in 1935?**

**Michael D. Bordo and Angela Redish**

Working Paper No. 2079

November 1986

JEL Nos. 311, 042

This paper examines three possible explanations for the emergence of the Canadian central bank in 1935: (1) it reflected the need of competitive banking systems for a lender of the last resort; (2) it was necessary to anchor the unregulated Canadian monetary system after the abandonment of the gold standard in 1929; and (3) it was a response to political rather than purely economic pressures. Evidence from a variety of sources (contemporary statements to a Royal Commission, the correspondence of chartered bankers, newspaper reports, academic writings, and the estimation of time-series econometric models) rejects the first two hypotheses and supports the third.

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## **Deficits with Distortionary Taxes: International Dimensions**

**Jacob A. Frenkel and Assaf Razin**

Working Paper No. 2080

November 1986

JEL Nos. 431, 320

This paper deals with the international effects of budget deficits that arise from distortionary tax and transfer policies. The analysis demonstrates that the consequences of tax policies and the characteristics of the international transmission mechanism depend critically on the precise composition of taxes. Specifically, the international effects of budget deficits of a given size differ sharply according to the types of taxes that generate the deficit. We show that in determining their effects, it is useful to divide the various distortionary taxes into two groups: those that stimulate current external borrowing (national dissaving) and those that stimulate current external lending (national saving). A tax policy that favors borrowing raises the world rate of interest, while a policy that favors lending lowers it. The resulting change in the rate of interest is the channel through which the effects of budget deficits are transmitted to the rest of the world. The key propositions are illustrated by a series of examples involving consumption taxes (VAT), taxes on income of labor and capital, and taxes on international borrowing.

inventiveness of American and Swedish firms or of declines in their management ability or their technological capabilities, but rather of economic developments in the firms' home countries.

The finding that firms have done better as exporters than their home countries have is strengthened when we look at different industry groups. In both the United States and Sweden, and in all industry groups with one exception, the multinationals' export shares increased relative to those of their home countries. The margins were often wide and were mostly larger for Swedish firms than for U.S. firms.

In general, although the basic story was quite similar for the United States and Sweden, there were some notable differences. For instance, the share of exports originating in affiliates was lower for Sweden than for the United States. To a large extent, this difference in the siting of export production reflected the much greater export orientation of Swedish parents relative to U.S. parents, presumably a consequence of the relatively small size of the Swedish domestic market. Another difference between U.S. and Swedish multinationals was that while the U.S. firms' share in world manufacturing exports remained stable over the studied period, the Swedish firms' share rose by 14 percent. So far, we are not in a position to say whether this was because Swedish firms increased their competitiveness more than U.S. firms did or because there was a higher conversion of Swedish firms into multinational status.

## **The Export Performance of Swedish and U.S. Multinationals**

**Magnus Blomström and Robert E. Lipsey**

Working Paper No. 2081

November 1986

JEL Nos. 421, 441

While the United States and Sweden both lost more than 20 percent of their shares of world and developed countries' exports of manufactures over the 15 years or so after the mid-1960s, the export shares of their multinational firms stayed fairly stable or even increased. The multinationals, while first increasing and then holding fairly constant their shares of exports by their home countries, raised the proportion of their worldwide exports that they supplied from their overseas affiliates. These developments suggest that the declining trade shares of the United States and Sweden were not mainly the result of deterioration in the innovativeness or

## **Tobin's Q and Financial Policy**

**Robert S. Chirinko**

Working Paper No. 2082

November 1986

JEL Nos. 130, 300

Recent research in macroeconomics has emphasized the importance of linking the financial and real sectors and the need for working with optimizing models. Tobin's Q model of investment appears to provide a framework that can satisfy these two criteria. In contrast to the original presentation of the Q model, the formal development has not recognized that the firm actively participates in a number of financial markets. In this broader context, I show that Q is likely to be an uninformative and possibly misleading signal for investment expenditures. I then endeavor to turn this negative theoretical result to positive advantage in resolving a number of empirical problems with Q models, but the modifications dictated by the theory receive little support from the data.

## **The Value of Patents as Indicators of Inventive Activity**

**Zvi Griliches, Ariel Pakes, and Bronwyn H. Hall**  
Working Paper No. 2083  
November 1986  
JEL No. 621

This paper summarizes a number of studies that use patent data to examine different aspects of technological change. First, it describes our effort in constructing a firm-level data set. Second, it reports on the relationship between R and D expenditures and the level of patenting. Third, it analyzes the relationship between patents, R and D, and the stock market value of firms. Fourth, it reports on the estimation of the value of patent rights based on European patent renewal data. Finally, it describes the use of patent data to estimate the importance of R and D spillovers.

We conclude that patent data represent a valuable resource for the analysis of technological change. They can be used to study longer-run interfirm differences in inventive activity and can substitute for R and D data where they are not available in the desired detail. We can also use a firm's distribution of patenting by field to infer its position in "technological space" and, in turn, to study how R and D spills over from one firm to another. Moreover, patent renewal data, which are also becoming available in the United States, allow one to construct more relevant "quality weighted" inventive "output" measures.

## **Optimal Monetary Growth with Accommodating Fiscal Policy in a Small Open Economy**

**Stephen J. Turnovsky**  
Working Paper No. 2084  
November 1986

This paper emphasizes how the choice of the optimal monetary growth rate in a small open economy under perfect capital mobility depends upon the accommodating policy chosen to maintain the overall budget constraint in the economy. When this occurs through lump-sum taxation, the optimal monetary growth rate is the "distorted" Friedman monetary rule. If the adjustment occurs through the income tax rate, then the optimal monetary growth rate involves a Phelps type of trade-off between the income tax rate and the inflation tax rate. The framework is suited for analyzing optimal macroeconomic policy in general, and the latter part of the paper considers an optimal monetary-fiscal package.

## **Growing in Debt: The "Farm Crisis" and Public Policy**

**Charles W. Calomiris, R. Glenn Hubbard, and James H. Stock**  
Working Paper No. 2085  
November 1986

U.S. farms, and with them agricultural lending institutions, are currently experiencing their most severe stress since the 1930s. As international trade in farm products has expanded, so has the sensitivity of farm incomes to fluctuations in domestic and world economic conditions. Thus, while price stabilization, acreage reduction, and related policies in place since the 1930s were relatively successful in stabilizing farm income during the 1950s and 1960s, they are likely to be less effective in achieving this goal in the future.

Our analysis of state-level panel data indicates that disruptions in agricultural credit markets can have real effects on farm output. That finding is consistent with the conventional wisdom that, unlike credit markets for large firms or for firms for which monitoring is less costly, agricultural financial markets require close customer arrangements. Local financial institutions, for which such relationships are best developed, are often unable, for institutional reasons, to diversify their loan risks either within agriculture or across other geographically separated activities. The deviations from perfect markets indicate an economic rationale—in addition to the usual political, social, and national defense rationales—for government intervention in agricultural credit markets. Our empirical evidence supports the view that maintaining customer relationships in agricultural finance is important. Because of the Farm Credit System's ability to pool agricultural loan risks nationally and its access to national capital markets, it will continue to be an important lender in agricultural credit markets.

## **Is Everything Neutral?**

**B. Douglas Bernheim and Kyle Bagwell**  
Working Paper No. 2086  
December 1986  
JEL Nos. 023, 321

In his well-known analysis of the national debt, Robert Barro introduced the notion of a "dynastic family." This notion has since become a standard research tool, particularly in the areas of public finance and macroeconomics. In this paper, we critique the assumptions upon which the dynastic model is predicated and argue that this framework is not a suitable abstraction in contexts in which the objective is to analyze the effects of public

policies. We reach this conclusion by formally considering a world in which each generation consists of a large number of distinct individuals, as opposed to one representative individual. We point out that family linkages form complex networks, and that each individual may belong to many dynastic groupings. The resulting proliferation of linkages among families gives rise to a host of neutrality results, including the irrelevance of all public redistributions, distortionary taxes, and prices. Since these results are not at all descriptive of the real world, we conclude that, in some fundamental sense, the world is not even approximately dynastic. These observations call into question all policy-related results based on the dynastic framework, including the Ricardian equivalence hypothesis.

the disposal of lenders, many borrowers have been able to consistently negotiate for reduced payments. This paper presents a model of the ongoing bargaining process that determines repayment levels.

We derive a bargaining equilibrium in which countries with large debts achieve negotiated partial default. The ability to credibly threaten more draconian penalties in the event of repudiation may be of no benefit to lenders. Furthermore, unanticipated increases in world interest rates may actually help the borrowers by making lenders more impatient for a negotiated settlement. Finally, Western governments may be induced to make payments to facilitate reschedulings even though efficient agreements will be reached without their intervention.

## **Does the Estate Tax Raise Revenue?**

**B. Douglas Bernheim**

Working Paper No. 2087

December 1986

JEL Nos. 321, 323

Proponents of transfer taxation argue that levies on gifts and estates serve the dual purpose of breaking up large concentrations of private wealth and raising significant revenues. A number of commentators have recently questioned the first of these purported advantages, on the grounds that a variety of available estate planning techniques allow wealthy individuals to pass on vast resources essentially tax free. Most techniques entail the use of intra vivos transfers and are particularly effective when these transfers are made as early in life as possible. In this paper, I argue that the use of these same estate planning techniques also largely neutralizes the second objective of transfer taxation by depressing income tax revenues. This effect is reinforced by the tendency for estate taxation to encourage charitable bequests. Although it is difficult to quantify the indirect revenue effects with a high degree of precision, I find that, prior to the Tax Reform Act of 1986, these effects could easily have offset all revenues collected through the estate tax. The recent Tax Reform Act vitiates these conclusions only partially.

## **A Constant Recontracting Model of Sovereign Debt**

**Jeremy I. Bulow and Kenneth Rogoff**

Working Paper No. 2088

December 1986

JEL Nos. 433, 443

Few sovereign debtors have repudiated their obligations entirely. But despite the significant sanctions at

## **Employee Response to Compulsory Short-Time Work**

**Victor R. Fuchs and Joyce Jacobsen**

Working Paper No. 2089

December 1986

JEL No. 813

This paper reports the results of a survey of over 1500 employees who faced compulsory reductions of 10 percent in hours of work and earnings during the second half of 1985. The workers were asked how they used the free time and how they viewed the program, and their answers were analyzed in relation to their economic and social characteristics. On average, the workers spent 12 percent of the free time in uncompensated work for the company, 45 percent in other work (mostly housework, childcare, and other nonmarket chores), and 45 percent in leisure activities such as resting, reading, and hobbies. *Ceteris paribus*, education and income were positively related to percentage of time spent in company work, and age was negatively related. Time spent in other work rose with the presence of children, especially for women. Employee reaction to the program was generally favorable; married women were most positive and married men least positive. Workers 45 years of age and over were significantly more positive than those 35-44. There was a strong connection between time use and reaction to the program; workers who spent more of their free time working without pay at the company or in home production were much less positive than those who spent more time in leisure activities.

## **Comparable Worth in a General Equilibrium Model of the U.S. Economy**

**Perry C. Beider, B. Douglas Bernheim, Victor R. Fuchs, and John B. Shoven**

Working Paper No. 2090

December 1986

JEL No. 824

This paper presents a computable general equilibrium model that simulates the effects on employment, output, wages, and economic efficiency of introducing comparable worth into the U.S. economy. The model calculates economywide aggregate impacts and disaggregated results for individuals grouped by sex, marital status, and education.

The effects depend on the hiring rules that would accompany comparable worth, the source of existing male-female wage differentials, the extent of coverage of comparable worth, the intrahousehold behavior of married couples, and demand and supply elasticities. If, after comparable worth is introduced, employers are constrained to employ men and women in historical proportions, the adverse effects on aggregate employment, output, and efficiency would be much larger than if the employment constraint is based on applicant proportions. If existing wage gaps are the result of sex differences in productivity, the adverse effects of comparable worth are relatively large; but if they are the result of discrimination, the efficiency losses are much smaller. If only part of the economy is subject to comparable worth, the efficiency loss is reduced under the productivity gap assumption but increased if the wage gap is the result of discrimination.

The redistributive effects of comparable worth on married men and women are sensitive to assumptions about intrahousehold behavior and the size of the gains from marriage. By contrast, unmarried women appear to benefit from comparable worth under most sets of assumptions while unmarried men lose.

## **New Developments in Corporate Finance and Tax Avoidance: Some Evidence**

**John B. Shoven**

Working Paper No. 2091

December 1986

The financial behavior of corporations has changed greatly in the last ten years. Previously, most of the cash that stockholders received from corporations was dividends, and economists' models with dividends ultimately determining equity values were not far off the mark. Now there are strong tax incentives for non-dividend cash payments between corporations and shareholders. These payments can take the form of a

repurchase by the company of its own shares, or the acquisition of the shares in another company.

In the early 1970s, nondividend cash payments amounted to roughly 15 percent of dividends. By 1984, they exceeded dividends, and in 1985 they amounted to \$120 billion, or almost 50 percent more than total dividends in the economy.

Nonetheless, dividends per unit of equity have not fallen. Rather, the acquisition of equity has allowed firms to retain relatively constant debt-equity ratios in the past five years despite strong equity markets. Firms have chosen to absorb equity and to issue debt, holding leverage roughly constant, and thus have saved large amounts of taxes.

The estimated cost to the Treasury of treating share purchase payments differently from dividends was more than \$25 billion in 1985. Also, future corporate tax collections are significantly reduced by the resulting decline in corporate equity. This suggests that the existing model of dividend-driven equity valuation must be discarded. It simply is not consistent with the facts.

## **Firm Size and Foreign Direct Investment**

**Magnus Blomström and Robert E. Lipsey**

Working Paper No. 2092

December 1986

JEL Nos. 442, 611

This paper uses data from American and Swedish firms to examine the importance of firm size in explaining foreign direct investment. The results suggest that firm size has only a threshold effect on foreign investment, an effect on the decision to invest abroad. However, once a firm has jumped the initial barriers to foreign production, size has no effect on the fraction of the firm's resources devoted to foreign activity. Among firms that invest in foreign production, large firms do not appear to have any particular advantage over small investing firms.

## **Imperfect Information, Credit Markets, and Unemployment**

**Bruce C. Greenwald and Joseph E. Stiglitz**

Working Paper No. 2093

December 1986

JEL No. 300

This paper describes how imperfect information in both capital and labor markets, in a context of maximizing firms and perfectly flexible prices and wages, can give rise to cyclical variations in unemployment closely resembling those in observed business cycles.

## Tax Policy and Stock Prices

**Thomas Downs and Patric H. Hendershott**

Working Paper No. 2094

December 1986

JEL Nos. 313, 323

Windfall profits and losses accrue to investors only when expected aftertax returns or discount rates change, as is likely when major tax policy shifts occur. This study uses a cash flow valuation model to estimate how tax changes cause windfalls for owners of U.S. nonfinancial corporations. We use the model to analyze two tax reform packages: the Treasury proposal of November 1984, and the Tax Reform Act of 1986.

We find that the original Treasury plan would have boosted stock prices by 20 to 30 percent; the Tax Reform Act of 1986 may increase stock prices by 10 to 12 percent. This anomalous result—a corporate tax increase (over five years) of \$125 to \$140 billion, raising stock prices—occurs because the tax increase falls only on new capital, not on old capital. The stock market largely values expected returns on the existing capital stock, and these returns will benefit from the adverse treatment of new investment.

## Forecasting the Depression: Harvard versus Yale

**Ray C. Fair, Matthew D. Shapiro,  
and Kathryn M. Dominquez**

Working Paper No. 2095

December 1986

JEL Nos. 131, 132, 042

Could the Depression have been forecast? After the stock market crash, how long did it take contemporary economic forecasters to realize how severe the downturn was going to be? How long should it have taken them to come to this realization? We address these questions by studying the predictions of the Harvard Economic Service and Yale's Irving Fisher during 1929 and the early 1930s. We subject the data assembled by the Harvard and Yale forecasters to modern statistical analysis to learn whether their verbal pronouncements were consistent with the data. We find that both the Harvard and the Yale forecasters were systematically too optimistic; however, nothing in the data suggests that their optimism was unwarranted.

## Amnesty, Enforcement, and Tax Policy

**Herman B. Leonard and Richard J. Zeckhauser**

Working Paper No. 2096

December 1986

Amnesties are widely used in society to rehabilitate past sinners, to collect resources—such as library books—that would otherwise not be recovered, and to make

enforcement easier by reducing the ranks of delinquents. Over the past four years, tax amnesties have emerged as a major instrument of state revenue policy. Twenty states conducted amnesties. The largest collections were made by New York (\$360 million) and Illinois (income tax amnesty dollars equaling 3.4 percent of total collections). Amnesties took in dollars that would probably have escaped otherwise, and tax rolls were bolstered. Tax amnesties also have costs, however. They may anger honest taxpayers, diminish the legitimacy of the tax system by pardoning past evasion, and decrease compliance by making future amnesties seem more likely.

Should the federal government, aswirl in tax reform and suffering from an estimated \$100 billion tax evasion problem, now offer an amnesty of its own? What type of federal program would most likely be offered? What would it be likely to accomplish? State tax amnesties generally have been coupled with enhanced enforcement efforts: a feature intended to preserve the legitimacy of the tax system. The amnesty/enforcement combination twists the penalty schedule, lowering it now but raising it later, in that way encouraging prompt payment. With no past sins to hide, future compliance also becomes less costly, hence more probable. Any federal amnesty, we predict, would be accompanied by a strengthening of enforcement. After reviewing the state experience, we estimate speculatively that a federal amnesty/enforcement program might collect \$10 billion initially and yield a continuing increment to annual revenues on the order of \$10 billion.

## Assessing Dynamic Efficiency: Theory and Evidence

**Andrew B. Abel, N. Gregory Mankiw,  
Lawrence H. Summers, and Richard J. Zeckhauser**

Working Paper No. 2097

December 1986

The issue of dynamic efficiency is central to analyses of capital accumulation and economic growth. Yet the question of what operating characteristics of an economy subject to productivity shocks should be examined to determine whether or not it is dynamically efficient has not been resolved. This paper develops a criterion based on observables for determining whether or not an economy is dynamically efficient. The criterion involves a comparison of the cash flows generated by capital with the volume of investment. Its application to the U.S. economy and to the economies of other major OECD nations suggests that they are dynamically efficient.

## **Real Estate and the Tax Reform Act of 1986**

**Patric H. Hendershott, James R. Follain,  
and David C. Ling**

Working Paper No. 2098

December 1986

JEL No. 323

In contrast to the conventional wisdom, the 1986 Tax Act does not disfavor real estate activity in the aggregate. Within the broad aggregate, however, widely different effects may be expected. Regular rental and commercial activity may be slightly disfavored, while historic and old rehabilitation activity might be greatly disfavored. In contrast, owner-occupied housing, far and away the largest component of real estate, is expected to be favored, both directly by a decline in interest rates and indirectly by the increase in rents. Low-income rental housing may be the most favored of all real estate activities.

We forecast that the rent increase for residential properties will be 10 to 15 percent with our assumption of a one percentage point decline in interest rates. For commercial properties, the expected rent increase is 5 to 10 percent. The market value decline, which may be greater the longer and further investors think rents will be below the new equilibrium, is unlikely to exceed 4 percent in fast-growth markets, even if substantial excess capacity currently exists. In no-growth markets with substantial excess capacity, market values could decline by as much as 8 percent from already depressed levels.

Average housing costs are predicted to decrease slightly for households with incomes below about \$60,000 but are expected to increase by 5 percent for those with incomes above twice this level. With the projected increase in rents, homeownership should rise for all income classes, but especially for those with income under \$60,000. The aggregate homeownership rate is projected to increase by three percentage points in the long run in response to the Tax Act.

The new passive loss limitations are likely to significantly lower the values of recent loss-motivated partnership deals and of properties in areas where the economics have turned sour (and vacancy rates have risen sharply). The limitations should have little impact on new construction and market rents, however. Reduced depreciation write-offs, lower interest rates, and higher rents all may act to lower expected passive losses. Moreover, financing can be restructured to include equity-kickers or less debt at little loss of value in general.

## **The Record and Improvability of Economic Forecasting**

**Victor Zarnowitz**

Working Paper No. 2099

December 1986

JEL No. 132

Have macroeconomic forecasts grown more or less accurate over time? This paper assembles, examines, and interprets evidence bearing on this question. Contrary to some critics, there are no indications that U.S. forecasts have grown systematically worse: that is, less accurate and/or more biased. Neither do any definite trends in a positive direction emerge from comparisons of annual and quarterly multiperiod forecasts and time-series projections for the principal aggregative variables.

This paper develops, and to some extent documents, the argument that major failures of forecasting are related to the incidence of slowdowns and contractions in general economic activity. Not only the forecasts of real GNP growth and unemployment but also those of nominal GNP growth and inflation often go seriously wrong when such setbacks occur. Forecasters tend to rely heavily on the persistence of trends in spending, output, and the price level. More attention to data and techniques that are sensitive to business cycle movements and turning points could help improve their record.

## **The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors**

**John Y. Campbell and Robert J. Shiller**

Working Paper No. 2100

December 1986

A linearization of a rational expectations, present-value model for corporate stock prices produces a simple relationship between the log of the dividend-price ratio and mathematical expectations of logs of future real dividend changes and future real discount rates. This relationship can be tested using vector autoregressive methods. We test three versions of the linearized model, which differ in their measures of discount rates, on U.S. time series for 1871-1986: using data on real interest rates, aggregate real consumption, and return variance. The results yield a metric that can be used to judge the relative importance of real dividend growth, measured real discount rates, and unexplained factors in determining the dividend-price ratio.

## **Did Henry Ford Pay Efficiency Wages?**

**Daniel M. G. Raff and Lawrence H. Summers**

Working Paper No. 2101

December 1986

In an effort to evaluate the relevance of efficiency wage theories of wage and employment determination, this paper examines Henry Ford's introduction in 1914 of the \$5 day. Our general conclusion is that the Ford experience strongly supports the relevance of these theories. Ford's decision to dramatically increase wages is most plausibly portrayed as the consequence of the type of labor problems stressed by efficiency wage theorists. The structure of the \$5 day program is consistent with the predictions of efficiency wage theories. There is vivid evidence that the \$5 day resulted in substantial queues for Ford jobs. Finally, significant increases in productivity and profits at Ford accompanied the introduction of the \$5 day.

## **A Standard Monetary Model and the Variability of the Deutschmark-Dollar Exchange Rate**

**Kenneth D. West**

Working Paper No. 2102

December 1986

This paper uses a novel test to see whether the Meese (1985) and Woo (1985) models are consistent with the variability of the deutschmark-dollar exchange rate from 1974 to 1984. The answer, perhaps surprisingly, is yes. Both models, however, explain the month-to-month variability as resulting in a critical way from unobservable shocks to money demand and purchasing power parity. Therefore, it would be of interest in future work to model one or both of these shocks as explicit functions of economic variables.

## **Tax Reform and Adjustment Costs: The Impact on Investment and Market Value**

**Alan J. Auerbach**

Working Paper No. 2103

December 1986

This paper derives analytical measures of the combined effects of tax changes and adjustment costs on investment and market value. Unlike earlier measures, the derived effective tax rate is valid in the presence of adjustment costs and anticipated tax changes. The derived measure of the impact of tax changes on market value permits estimation of the effects of various

tax changes on market value and its components, discounted pure profits and normal returns to capital, and decomposition of changes in the value of capital into changes in the marginal value of new capital and changes in the relative value of new and existing capital. I use these measures to evaluate tax changes similar to those introduced by the recent U.S. tax reform.

## **Married Women's Retirement Behavior**

**Silvana Pozzebon and Olivia S. Mitchell**

Working Paper No. 2104

December 1986

We examine the economic and family determinants of married women's retirement behavior in this paper by developing a model of wives' retirement decisions. We test this model empirically using data on working married women. We then compare estimated response parameters to those obtained previously for male workers. Our findings are directly relevant to policy questions regarding pension and Social Security reform.

## **Interest Rate and Exchange Rate Determination**

**Ray C. Fair**

Working Paper No. 2105

December 1986

Since Meese and Rogoff's (1983) results, the view has become fairly widespread that structural models of exchange rates are not very good. However, there is some dichotomy in the literature between those who deal with small models, in which the focus is almost exclusively on exchange rates, and those who deal with large macroeconomic models, in which exchange rates make up only a small subset of the endogenous variables. Most of the emphasis has been on the first approach, and it may be that exchange rate determination within the context of large models has not been given a sufficient hearing.

I estimate and analyze exchange rate and interest rate equations for 17 countries in this paper. This study is part of a larger project of constructing a multicountry econometric model. One of the aims of the paper is to see if the exchange rate equations that are part of my multicountry model also suffer from the Meese and Rogoff criticism. The results show that the view that structural exchange rate models are not very good may be too pessimistic.



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