NBER Reporter

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Program Report

Business Cycles[1]

Donna L. Zerwitz[2]

While many readers of the popular press are familiar with such terms as "recession" and "expansion," few are likely to know that these downs and ups in the economy have been the subject of research at the NBER for nearly 70 years. Indeed, Wesley C. Mitchell, one of the Bureau's founders and its director of research for the first 25 years, had published a treatise on *Business Cycles* in 1913. When the NBER's certificate of incorporation was signed and recorded in 1920, business cycles had already been designated as the Bureau's second project, to follow the development of a series of national income accounts.

Business cycles are merely recurrent sequences of ups and downs in economic activity. These ups and downs are important because they represent major fluctuations in employment, production, real income, and real sales.

Shortly after the Bureau's founding, the NBER staff began to compile comprehensive chronological records of changes in economic conditions in the United States, England, France, Germany, Austria, and twelve other countries. These "business annals," as they were called, resulted in a 1926 volume with that title by Willard L. Thorp,[3] who is still a director emeritus on the NBER Board.

Also in the early 1920s, the NBER began collecting and analyzing time-series data on various aspects of modern economies. Narrowing the focus to the United States, England, France, and Germany, the NBER staff was able to compare these economic indicators to the trends described in the annals. Through a painstaking collective effort by a group of distinguished economists including Moses Abramovitz, Arthur F. Burns, Milton Friedman, Simon Kuznets, and Geoffrey H. Moore, the NBER finally compiled monthly, quarterly, and annual reference chronologies of business cycles. For the United States and Britain, these tables went back on a monthly basis to 1854.

In 1927, Mitchell published a volume on business

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This issue of the *Reporter* highlights the Bureau's research on business cycles. Next, James H. Stock and Mark W. Watson describe their development of new experimental indexes of coincident and leading economic indicators; Kenneth A. Froot reports on his study of asset-price expectations; and Jeffrey A. Miron discusses his research on the seasonal cycle and the business cycle. 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.

[1] *Much of the historical information in this article comes from S. Fabricant,* Toward a Firmer Basis of Economic Policy: The Founding of the National Bureau of Economic Research, *NBER pamphlet, 1984.*

[2] *Director of Public Information, NBER.*

[3] *W. L. Thorp,* Business Annals, *NBER General Series No. 8, 1926.*

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cycles that established a workable definition and outlined a research program that was followed for many years thereafter.[4] In 1946, Burns and Mitchell rephrased the definition as follows: "Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansion occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals that merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character with amplitudes approximately their own."[5]

This definition has been used for more than 60 years and is still used today. It is particularly noteworthy that the definition places no fixed requirement on the *duration* of expansions and contractions, their amplitude, or their scope. Nor did Mitchell define "aggregate economic activity," because there is no single comprehensive measure available for a long historical period—on a monthly or quarterly basis—that is comparable throughout in its coverage and adequate throughout in its statistical foundation.

In simple terms, one can visualize a business cycle by thinking of moving along a curve from a peak (or high point) through a trough (low point) and on to the next peak. Each peak marks the end of an expansion and the beginning of a contraction, or recession. Each trough marks the end of the contraction. The NBER's chronology of U.S. business cycles lists peaks and troughs in months and quarters back to 1854, and in annual terms back to 1790.

Historically, as now, determining when there was a turning point (peak or trough) in the economy was a two-step process. First, has there been a turning point? Here the NBER's historical series are useful for comparing current economic activity with earlier business cycles in terms of: duration, depth of the decline in aggregate activity, and diffusion among different economic activities and in different industries, sectors, and regions.

To identify the peak, for example, total business sales, the industrial production index, real GNP, the unemployment rate, nonagricultural employment, man-hours of nonfarm employment, and personal income must all be considered. Composite indexes of these series, and the components of each series, are also useful. As Moore points out, one of the advantages of basing the decision on such a wide variety of evidence "is that it reduces

[4] *W. C. Mitchell,* Business Cycles: The Problem and Its Setting, *NBER Studies in Business Cycles No. 1 and General Series No. 10, 1927.*

[5] *A. F. Burns and W. C. Mitchell,* Measuring Business Cycles, *NBER Studies in Business Cycles No. 2, New York: Columbia University Press, 1946.*

the possibility of error and the need for subsequent revision."[6]

In 1961, the U.S. Department of Commerce began to include the NBER business cycle chronology in a monthly publication, now called the *Business Conditions Digest.* In that year, in a sense, the NBER became the official arbiter of the business cycle in the United States.

Since 1980, official business cycle turning points in the United States have been determined by the NBER's Business Cycle Dating Committee. Its current membership is: Chairman Robert E. Hall; NBER President Martin Feldstein; Geoffrey H. Moore, an NBER director and research associate emeritus; NBER Program Directors William H. Branson and Benjamin M. Friedman; and NBER Research Associates Victor Zarnowitz and Robert J. Gordon.

The committee last met in July 1983 when it identified November 1982 as the trough of the recession that began in July 1981. Following the lessons of the Bureau's founders, the Committee reviews a wide range of seasonally adjusted, revised data before making its decision. In a brief statement explaining the dating of the 1982 trough, the Committee referred to real GNP, real retail sales, total employment, nonfarm employment, real personal income, industrial production, and total unemployment as some of the factors that were influential.

The NBER continues to conduct research on business cycles. A complete listing of this work appears in *A Decade of NBER Books, 1979-1988* or in *NBER Publications, 1921-1988.* Each is available free of charge by writing to: Publications Department, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

References

Fabricant, S., *Toward a Firmer Basis of Economic Policy: The Founding of the National Bureau of Economic Research,* NBER pamphlet, 1984.

Gordon, R. J., *The American Business Cycle: Continuity and Change,* NBER Studies in Business Cycles No. 25, Chicago: University of Chicago Press, 1986.

Moore, G. H., *Business Cycles, Inflation, and Forecasting,* NBER Studies in Business Cycles No. 24, Cambridge, MA: Ballinger Publishing Company, 1983.

A volume by Victor Zarnowitz on business cycles is forthcoming from the University of Chicago Press.

[6] *G. H. Moore,* Business Cycles, Inflation, and Forecasting, *2nd ed., NBER Studies in Business Cycles No. 24, Cambridge, MA: Ballinger Publishing Company, 1983.*

Research Summaries

Indexes of Coincident and Leading Economic Indicators[1]

James H. Stock and Mark W. Watson

For 50 years, economists in business and government have used the system of leading economic indicators to gauge the future course of economic activity. The system of leading, coincident, and lagging economic indicators originally was developed by Arthur F. Burns, Wesley C. Mitchell, and their colleagues at the NBER and is currently maintained by the U.S. Department of Commerce (DOC). Some 32 countries throughout the world now have a system of indicators that they use. The indexes of coincident and leading economic indicators themselves—weighted averages of key coincident and leading time series—play a central role in contemporary uses of this system. The coincident index measures the current state of the economy. The leading index often is interpreted as giving advance information about the future direction of the economy, particularly whether toward an expansion or a recession.

In recent work, we have taken a new look at the construction and interpretation of the indexes of coincident and leading economic indicators. The methods used to construct these indexes have remained largely unchanged for the last 30 years. We have exploited recent developments in time-series econometrics to improve the performance of the coincident and leading economic indexes constructed using traditional techniques. This work has resulted in the development of three experimental indexes: an index of coincident economic indicators (CEI), an index of leading economic indicators (LEI), and a new series that we call a "recession index" (RI). These three indexes, their construction, and their interpretation are described in this Research Summary.

The Index of Coincident Economic Indicators

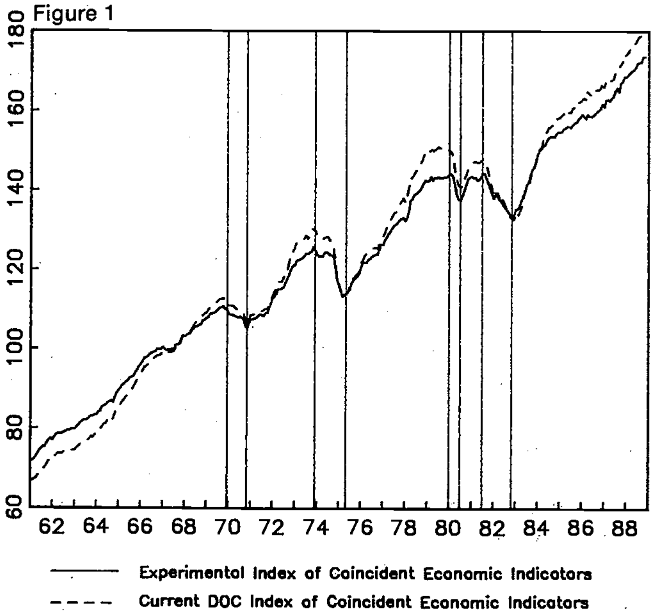
In constructing an index of leading indicators, the first step is to define what this index leads. The index of coincident indicators currently maintained by the DOC is a weighted average of four broad measures of economic activity: industrial production, real personal income less transfer payments, real manufacturing and

[1] *This report draws on research reported in J. H. Stock and M. W. Watson, "New Indexes of Coincident and Leading Economic Indicators," presented at the NBER Macroeconomics Conference, 1989. This work was funded in part by the NBER. The results of this work are still experimental and do not constitute an official new set of NBER indexes.*

trade sales, and the number of nonagricultural employees. While each of the series exhibits its own idiosyncratic movements (which include errors of measurement), the *common* movement among the series may arise from general swings in economic activity, that is, from the business cycle. Thus averaging these series provides one way to eliminate the idiosyncratic movements and obtain a better estimate of swings in overall activity.

But how can this averaging best be done? The traditional NBER/DOC approach is to take a weighted average of contemporaneous growth rates of the coincident series, in which the weights depend on the standard deviations of the series. Although we chose to construct the weights somewhat differently—using an explicit statistical model—the net result is very similar to the DOC coincident index. (Our weights are from an estimated "dynamic factor model," in which the unobserved state of the economy is the sole source of comovements among the coincident variables.)[2] The major difference between the variables in our experimental index and the DOC index is that we use employee-hours rather than the number of employees.

Figure 1



[2] *In theory the traditional method and the "dynamic factor model" approach could have produced quite different indexes. The fact that the indexes are so similar can be interpreted as providing a formal statistical rationalization for the traditional procedure. The application of dynamic factor models to macroeconomic time-series variables was developed by T. J. Sargent and C. A. Sims, "Business Cycle Modeling without Pretending to Have Too Much A Priori Economic Theory," in C. A. Sims et al.,* New Methods in Business Cycle Research, *Minneapolis: Federal Reserve Bank of Minneapolis, 1977. For details concerning the construction of the coincident indicator model, see J. H. Stock and M. A. Watson, "A Probability Model of the Coincident Economic Indicators," in G. H. Moore and K. Lahiri, eds.,* The Leading Indicators: New Approaches and Forecasting Records, *New York: Cambridge University Press, forthcoming.*

The DOC coincident index and our experimental coincident index are plotted in Figure 1; both are scaled to equal 100 in 1967. The vertical bars in Figure 1 denote official NBER-dated peaks and troughs. The major difference between the experimental index and the DOC index is the slightly higher trend growth in the DOC index. The correlation between the monthly growth rates of the two series is high (the correlation coefficient is .95). Moreover, the timing of peaks and troughs in the two indexes is the same.

The Indexes of Leading Economic Indicators

The existing index of leading indicators serves two distinct purposes: to forecast the growth of the economy over the next several months, and to provide an early signal of an upcoming recession or expansion. Our experimental indexes separate these two functions: the experimental LEI is a forecast of the growth of the overall economy (as measured by the CEI) over the next six months, while the RI reports a probability of the economy being in a recession in six months.

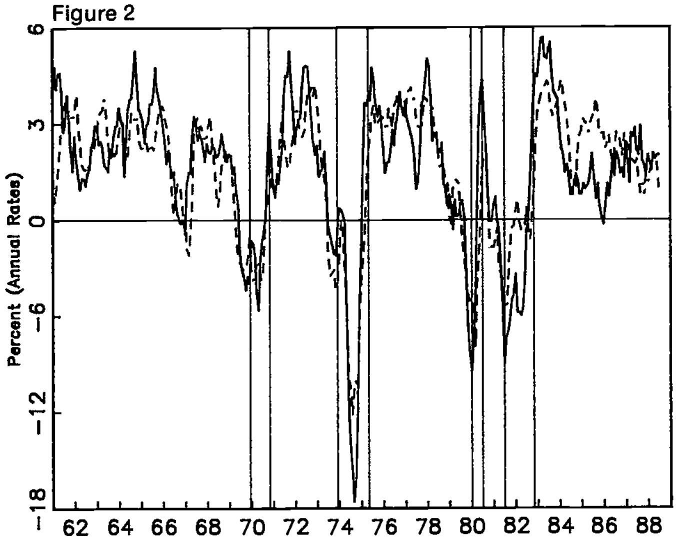
We use seven leading series, selected from an original list of over 280 series, to construct the experimental LEI. Traditionally series for the leading index have been chosen based on their historical ability to lead some measure of overall activity, such as the coincident index. For our experimental LEI, we used this "bivariate" approach to screen possible series but relied on a "multivariate" criterion in developing the final list. This criterion identified variables that have information not contained in the other time series already in the experimental LEI but that have been useful historically for forecasting overall activity six months hence.

Of the seven variables in the experimental LEI, two are in the current DOC index: manufacturers' unfilled orders (durable goods industries) and new private housing authorizations.[3] Of the remaining five variables, three are based on interest rates: the spread between six-month commercial paper and six-month U.S. Treasury bills; the spread between ten-year Treasury bonds and one-year Treasury bonds; and the change in the ten-year Treasury bond rate. The final variables are part-time work in nonagricultural industries because of slack work and a trade-weighted index of exchange rates between the United States and the United Kingdom, West Germany, France, Italy, and Japan.

The experimental LEI (the forecast of the growth in the experimental CEI over the next six months, at annual rates, based on these seven variables) is plotted in Figure 2. Also plotted in Figure 2 is the actual six-month growth of the CEI. Like any forecast, the LEI is an imperfect map of future economic events. By comparing the two series, one can get a sense of when the experimental LEI would have succeeded and when it would

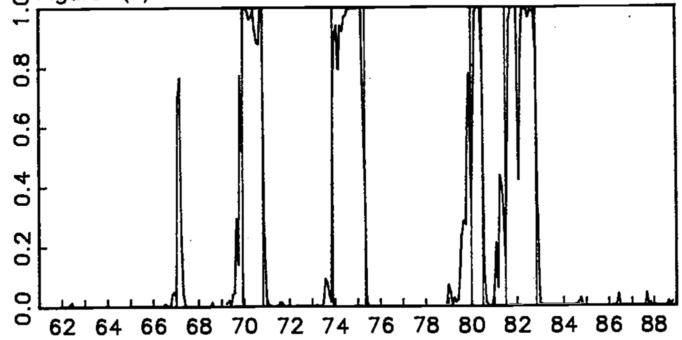
[3] *The DOC revised its leading and lagging indexes in March 1989, for data starting January 1989; the coincident index was not changed. These remarks refer to the most recent revision.*

Figure 2



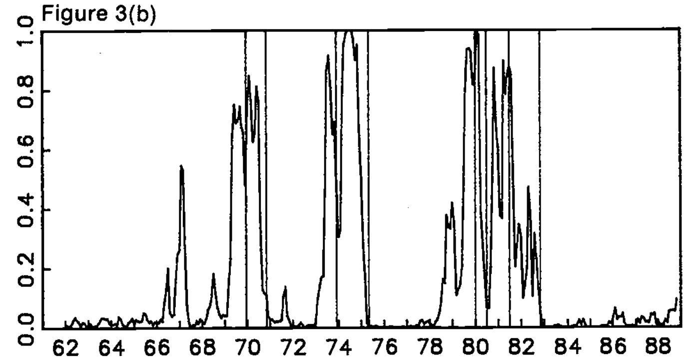
——— Six–month growth in the experimental CEI
- - - - Six–month growth in the experimental LEI

Figure 3(a)



Contemporaneous Recession Probability

Figure 3(b)



Six–month Ahead Recession Probability

have failed. In the summer of 1979, for example, the experimental LEI became negative, indicating negative growth in the CEI over the next six months; in fact this is what occurred. In contrast, in early 1982 the experimental LEI hovered near zero, when in fact the economy continued to suffer a decline.

Interest rates play an important role in the LEI: an inverted Treasury bond yield curve and a high spread between short-term commercial paper and Treasury bills of a matched maturity are statistically important precursors of declines in overall economic activity. Interestingly, the statistical selection procedures that led to these seven series indicated that some traditional leading variables—in particular, the money supply (M2) and the growth of stock prices—have little additional forecasting value, once the information in the seven series already in the experimental LEI are taken into account.

The series in Figure 3(b) answers a more difficult question: will the economy be in a recession six months hence? This is the experimental RI. Not surprisingly, the probabilities in Figure 3(b) are not as sharp as those in Figure 3(a). Still, based on historical data, the RI would have "predicted" each of the four recessions since 1960, although it incorrectly "predicted" one recession (in 1967) that did not occur.

The Recession Index

An important objective of this research has been to develop a new index that provides a direct assessment of whether the economy will slip into a recession. The Recession Index estimates the probability that the economy will be in a recession six months hence. This probability is calculated using the time series comprising the experimental CEI and LEI.

Two series that measure whether the economy is or will be in a recession are plotted in Figure 3. Figure 3(a) represents a series that answers the question: is the economy currently in a recession? That is, this series is the probability that the economy is in a recession in a given month, using data available through the end of that month. Because this series is a probability, it ranges between zero and one: a value of near one indicates that it is highly likely that the economy is, at that date, in a recession.

Summary

These experimental indexes have been developed by closely examining historical patterns using the tools of modern econometrics. The emphasis in developing the LEI and the RI has been to exploit information in multiple time series, rather than to focus on the bivariate relationship between a given time series and the business cycle, one series at a time. In principle, this approach offers the possibility of substantial improvements in the prediction of recessions and expansions. By tracking the future performance of these indexes, we will be able to determine whether this possibility is realized.

Asset-Price Expectations

Kenneth A. Froot

Most investors know that excess returns on stocks, bonds, and exchange rates are largely unpredictable. Rationally, they realize that if an asset were widely perceived to be cheap, it would not remain cheap for very long. Speculation ensures both that there will be no easy money and that any predictable component of price changes will be dwarfed by the magnitude of the price changes themselves.

With sophisticated statistical methods at their disposal, economists have been busy identifying these predictable components. Although this portion of returns comprises only a tiny fraction of short-horizon price movements, it has become the subject of heated debate. Some economists argue that any portion of returns found to have been predictable must already have been in investors' minds. In other words, they argue that we can learn about investors' expectations by looking at what actually happened to prices. So, for example, if the stock market rises rapidly for several years, they might conclude that the expected return on stocks was very high (but that stocks also must have been very risky).

However, others disagree with this approach. They contend that investors do not think of this portion of returns as predictable but rather that the predictable components are either statistical artifacts or evidence that some investment strategies indeed pay high risk-adjusted returns. Therefore, the alternative view holds that a rapid rise in stock prices tells us little about investor expectations.

One portion of my research has focused on expectations of asset-price changes. In particular I ask: first, how well can one approximate the market's expectation from actual realizations; and, second, to the extent that the approximation is poor, how do expectations behave in fact?

Findings from Survey Data

In order to answer these questions, one needs a new measure of investor expectations. In a number of papers, several coauthors and I have used survey data on asset-price expectations elicited from asset-market participants. These data come from seven independent surveys (five from foreign exchange markets and two from bond markets) conducted across a broad range of sample periods, forecast horizons, and financial instruments. Despite this diversity, several striking facts emerge consistently from these data:

1) *The shorter the forecast horizon, the more expectations extrapolate recent price trends.* While at short horizons, investors expect current trends to continue, at long horizons they expect the reverse. In the foreign exchange market, for example, a recent depreciation of the dollar by 10 percent generates the expectation that the dollar will depreciate another 1.4 percent over the following seven days. Acting on the basis of such expectations, investors are more likely to sell when the price of foreign exchange is already low. By contrast, the same 10 percent depreciation leads investors to think that the spot rate will *appreciate* by 2.0 percent over the next year. This pattern across forecast horizons lends credence to the long-held concern that speculation based on shorter-term expectations may be destabilizing, making the exchange rate too volatile around its long-run equilibrium. Not incidentally, one requires the surveys to identify this pattern in the foreign exchange and bond markets. Actual short- and long-horizon price changes reveal little evidence for or against it because of statistical imprecision.[1]

2) *Expectations conform closely with the simplest—and most popular—theories of relative asset pricing.* Under these theories, expected holding returns for different assets are equal (at least up to a constant): In the bond market, for example, the "expectations hypothesis" states that investors expect to earn the same return by holding a long-term bond for two years as they would by rolling over two consecutive one-year bills. Thus, if the spread between long-term and short-term interest rates increases, expected future short-term rates must increase as well. The surveys suggest that investors' expectations move strongly with changes in this spread. In particular, when the spread between bond yields and short rates increases by one percentage point, expected future interest rates on average increase by the same amount.[2]

In work with Jeffrey A. Frankel, I found similar results in the foreign exchange market. When interest rates in the United Kingdom rise relative to those in the United States, investors believe that the pound will depreciate by enough to leave the relative rate of return in the two currencies unchanged. This is consistent with "uncovered interest parity," which says that movements in interest differentials are offset exactly by changes in expected depreciation. The survey measures suggest that investor expectations conform closely to what this theory predicts. As in the bond market, expected depreciation of the dollar tends to respond

[1] *For more detail see: J. A. Frankel and K. A. Froot, "Short-Term and Long-Term Expectations of the Yen/Dollar Exchange Rate: Evidence from Survey Data," NBER Reprint No. 1044, September 1988, and* Journal of the Japanese and International Economies *1 (September 1987), pp. 249-274; K. A. Froot and T. Ito, "On the Consistency of Exchange Rate Expectations," NBER Working Paper No. 2577, May 1988, and* Journal of International Money and Finance, *forthcoming; and J. A. Frankel and K. A. Froot, "Using Survey Data to Test Standard Propositions Regarding Exchange Rate Expectations," NBER Reprint No. 854, April 1987, and* American Economic Review *77 (March 1987), pp. 133-153.*

[2] *K. A. Froot, "New Hope for the Expectations Hypothesis of the Term Structure of Interest Rates," NBER Working Paper No. 2363, August 1987, and* Journal of Finance, *forthcoming.*

one-for-one with changes in the interest rate in the United States relative to interest rates abroad.[3]

3) *Actual price realizations often provide a biased approximation of expectations.* While the survey measures reaffirm these popular pricing theories, actual price realizations do not. Indeed, by looking at ex post data and trying to infer the behavior of expectations from them, one arrives at exactly the *opposite* conclusion about expectations. For example, in the bond market, when the spread rises, one would infer from ex post data that expected future interest rates would remain essentially unchanged, not increase one-for-one. In the foreign exchange market, when the interest rate in the United Kingdom rises relative to that in the United States, one would similarly infer no effect on expected dollar depreciation. Thus, the inference from ex post prices is that investors suddenly expect to earn a higher return by holding bonds and pound deposits than by holding bills and dollar deposits. It is economists' peculiar form of hindsight that investors all along expected to receive high returns in one asset or another. This is very far from the predictions of the simple asset-pricing models, in which expected holding returns remain roughly equal.

The disparity between these two views of how expectations behave implies there are systematic differences between expected future rates (as measured by the surveys) and actual future rates. One way to understand these systematic differences is to think of expected future rates as "overreacting" to all information except the current spot (or short) rate.[4] For example, when long rates rise relative to short rates, expected future interest rates also rise. Unfortunately, at least in the post-World War II period, this prediction overstates the actual response: future interest rates did not tend to rise subsequent to increases in the spread. This kind of systematic error implies that when long-maturity rates rise—and, therefore, bond prices fall—bonds historically have been good buys. Similarly in the foreign exchange market, when interest rates abroad rise relative to those in the United States, foreign currency deposits tend to yield higher returns than domestic currency deposits do. The pattern also holds in the stock market: when short-term interest rates are low, stocks tend to yield relatively high returns.

To some economists, the idea that investors can make this kind of systematic mistake, even over short periods, is anathema. A more balanced view, however, would bear two points in mind. First, the economic gains from exploiting these systematic errors are both small and precarious. In the foreign exchange market, for example, a $1000 bet that takes advantage of these errors earns an excess return of less than $2, with a standard deviation of $65! Second, the ability to identify such small returns itself indicates that the power of our econometric methods has far outraced our understanding of the world. Small systematic errors can plausibly stem from a variety of sources, including—but certainly not limited to—investor irrationality. Only recently have we begun to explore the following alternative explanations.

How Should We Interpret This Evidence?

1) *Ignore it.* However convenient, it is bad science to disregard independent, disconfirming information. Yet some may prefer this route. One sometimes hears that the mere existence of systematic prediction errors should disqualify survey data as a useful source of information.

2) *Conclude that investors are not rational.* This conclusion may be sensible but, based solely on the size of the errors, should not be disturbing. Surely the potential cumulation of these incremental mistakes into large and persistent swings in asset prices is much more disconcerting.[5] Recent examples of such swings include the stock market runup and crash of 1985–7 and the extraordinary overvaluation of the dollar during 1982–6. On this score, ironically, the survey predictions at long horizons get higher marks than those made by the time-series econometrician. For example, during 1982–4, the dollar was appreciating steadily and was overvalued by an average of about 30 percent (relative to standard measures of long-run equilibrium values). The surveys were calling for a rapid annual rate of depreciation of 10 percent, while the econometrician—noting that the exchange rate follows a random walk—was calling for something close to zero.

The problem may lie more with short-term expectations. Because they tend to extrapolate recent trends, they were calling for further appreciation over this period.[6] It is hard to square these predictions either with long-run fundamentals or with the long-horizon forecasts made by the same investors. This lack of consistency across different forecast horizons may reflect a tendency of investors to use different models of the spot rate at short versus long horizons, and a blend in

[3] *K. A. Froot and J. A. Frankel, "Forward Discount Bias: Is It an Exchange Risk Premium?"* Quarterly Journal of Economics *416 (February 1989), pp. 139–161. For an earlier, more comprehensive version of the same paper see "Findings of Forward Discount Bias Interpreted in Light of Exchange Rate Survey Data," NBER Working Paper No. 1963, June 1986.*

[4] *K. A. Froot, "Tests of Excess Forecast Volatility in the Foreign Exchange and Stock Markets," NBER Working Paper No. 2362, August 1987.*

[5] *For a model in which these persistent over- or undervaluations are caused by purely rational forces, see K. A. Froot and M. Obstfeld, "Intrinsic Bubbles: The Case of Stock Prices," NBER Working Paper, forthcoming.*

[6] *Evidence that trading volume and exchange rate volatility are related positively over short, but not long, horizons could be consistent with the hypothesis that short-term speculation destabilizes prices. For a discussion of these issues see K. A. Froot, "Multinational Corporations, Exchange Rates, and Direct Investment," in W. H. Branson, J. A. Frenkel, and M. Goldstein, eds.,* International Policy Coordination and Exchange Rate Determination, *Chicago: University of Chicago Press, forthcoming.*

between. Frankel and I model the interaction between "chartists" and "fundamentalists." We suggest that investors may form expectations by weighting these two views according to their own expected trading horizon, with chartist views more important for short horizons and fundamentalist views more important for long horizons.[7]

3) *Consider the possibility of influential, but uncommon events.* "Peso problems" may lead to repeated forecast errors in small samples and consequently invalidate standard statistical inferences. For example, investors may believe that if asset prices or fundamentals reach extreme values, then authorities will change not only their policies but also their policy reaction *functions.* In work with Maurice Obstfeld, I have studied how asset prices behave in the presence of several types of prospective regime shifts. The results (which rely on new techniques for regulated Brownian motions) show how potential regime shifts "bend" the response of rationally expected future asset prices to changes in fundamental factors. If the econometrician does not account explicitly for such shifts, this bending will appear in the form of systematic expectational errors.[8]

4) *Ask whether investors learn as they go.* Economists often assume investors are born understanding the economy. But if the economy is as much of a moving target as is economics, then the predictions of rational but initially uninformed investors may not converge quickly or at all to the economy's actual behavior. Put differently, rationality can be defined only relative to specific information. In the model of chartists and fundamentalists mentioned earlier, portfolio managers choose the best combination of these two predictions, based on the behavior of the exchange rate. In a sense they are not fully rational—they could do better if they understood the economy perfectly. Instead they do the best they can, working with limited information and trying to make sure they adjust their views as new information arrives.

In sum, my findings suggest that we should not feel complacent about our ability to understand expectations by looking at the behavior of realized prices. Easy answers from standard time-series regressions may not point in the right direction. These issues are, and will remain, important because of the real effects that asset prices and expectations have on economic activity.[9] These issues also raise doubts about the interpretation of financial economists' tests of subtle theories of relative asset pricing.

[7] *J. A. Frankel and K. A. Froot, "Chartists, Fundamentalists, and the Demand for Dollars," in A. Courakis and M. Taylor, eds.,* Policy Issues for Interdependent Economies, *London: Macmillan, forthcoming; "Understanding the U.S. Dollar in the 1980s: The Expectations of Fundamentalists and Chartists," NBER Reprint No. 957, December 1987; and "The Dollar as an Irrational Speculative Bubble: A Tale of Fundamentalists and Chartists," NBER Reprint No. 959, January 1988.*

[8] *K. A. Froot and M. Obstfeld, "Exchange Rate Dynamics under Stochastic Regime Shifts: A Unified Approach," NBER Working Paper No. 2835, February 1989.*

[9] *For an example of the real effects of prices and expectations on firms' market share investments and pricing decisions see K. A. Froot and P. Klemperer, "Exchange Rate Pass-Through When Market Share Matters," NBER Working Paper No. 2542, March 1988, and* American Economic Review, *forthcoming.*

The Seasonal Cycle and the Business Cycle

Jeffrey A. Miron

Most recent research on macroeconomic fluctuations ignores the seasonal variation in the economy by working with seasonally adjusted or annual data. There are several reasons why this approach may be desirable. Seasonal fluctuations might be small enough relative to business cycle fluctuations that removing them has little effect on empirical results. Alternatively, seasonal fluctuations might be generated by fundamentally different mechanisms than the ones that produce cyclical fluctuations, in which case the two kinds of fluctuations can be addressed separately. Finally, seasonal fluctuations might be natural and desirable while business cycle fluctuations traditionally are thought to involve significant welfare losses.[1]

The research that I have carried out over the past five years challenges a number of the most frequently cited reasons for ignoring seasonality, and it suggests that a unified approach to studying seasonal and cyclical fluctuations may be warranted. This line of research resumes an older tradition of NBER analysis of fluctuations, exemplified by Simon Kuznets, in which both seasonal and business cycle fluctuations were regarded as important topics of investigation.[2] Here I summarize the main findings of my research to date and discuss

[1] *Undoubtedly one further reason for the general preference for seasonally adjusted data is that seasonally unadjusted data often are difficult to obtain. In most cases, however, seasonally unadjusted data (or reasonable proxies for such data) can be constructed. See the appendixes to the papers cited below for sources of seasonally unadjusted data.*

[2] *S. Kuznets,* Seasonal Variations in Industry and Trade, *New York: NBER, 1933; W. S. Woytinsky,* Seasonal Variations in Employment in the United States, *Washington, DC: Social Science Research Council, 1939; J. P. Bursk,* Seasonal Variations in Employment in Manufacturing Industries, *Philadelphia: University of Pennsylvania Press, 1931; E. W. Kemmerer,* Seasonal Variations in the Relative Demand for Money and Capital in the United States, *National Monetary Commission, 1910; and F. R. Macaulay,* Some Theoretical Problems Suggested by Movements of Interest Rates, Bond Yields, and Stock Prices in the United States since 1856, *New York: NBER, 1938.*

possible implications of the results for understanding economic fluctuations.

The Patterns and Importance of Seasonal Fluctuations

The first goal of my research has been to examine the seasonal patterns in standard macroeconomic variables and to document their quantitative importance.[3] Seasonal fluctuations account for more than 85 percent of the fluctuations in the rate of growth of real GNP, and seasonal fluctuations are present in every major type of economic activity, including consumption, investment, government purchases, industrial production, retail sales, unemployment, and the money stock. Seasonal movements are not a quantitatively important feature of either prices or interest rates, however.

The seasonal pattern in quarterly real GNP consists of large increases in the second and fourth quarters, a large decrease in the first quarter, and a mild decrease in the third quarter. In the fourth quarter boom, output on average is 8 percent higher than it is every winter. The seasonal patterns in consumption purchases and output are similar, and the seasonal pattern in government purchases also is dominated by a first quarter decline and a fourth quarter increase. Fixed investment grows strongly in the second quarter, grows slightly in the third quarter, declines weakly in the fourth quarter, and declines strongly in the first quarter.

Monthly data show that industrial production falls strongly one to three months before Christmas, recovers in February, declines dramatically in July, and then rebounds strongly in August. Retail sales grow substantially in December but then decline tremendously in January. Likewise, the money stock exhibits a large, positive growth rate in December and a large, negative growth rate in January. The movements in labor market variables mirror those in output for the most part, although the fluctuations are smaller in magnitude.

The seasonal patterns just described are characteristic of most developed countries. It is particularly noteworthy that Australia and New Zealand exhibit seasonal patterns strikingly similar to those in most countries in the Northern Hemisphere. These results therefore shed light on the reasons for particular seasonal movements in aggregate data. The large booms in consumption in the fourth quarter and in retail sales in December obviously are caused by Christmas spending, especially since these occur in Southern Hemisphere countries. The July–August troughs in industrial production, which do not appear in the Southern Hemisphere, presumably represent preferences for summer vacations. The first quarter trough in all economic activity, which is more pronounced in the Northern Hemisphere, plausibly reflects both the end of the Christmas season and the comparatively poor weather in the first quarter.

In addition to demonstrating the quantitative importance of seasonal fluctuations, the results on the patterns of seasonal variation provide some easily identifiable examples of shifts in demand or supply at the aggregate level. That is, there are identifying restrictions available for the seasonal cycle that are not available for the conventional business cycle. One important reason for studying seasonal cycles is that we can use the seasonal information to identify relationships that may not be identifiable from business cycle information alone.

The Similarity of the Seasonal Cycle and the Business Cycle

The second phase in my examination of seasonal fluctuations consists of a comparison of the properties of seasonal cycles and business cycles. That is, rather than assuming that seasonal cycles and business cycles are generated by different mechanisms, I ask to what extent the two types of fluctuations display similarities. The key finding of this investigation is that business cycles and seasonal cycles are surprisingly similar.

The first important similarity between seasonal and cyclical fluctuations is simply that there is an aggregate seasonal cycle. Just as with business cycles, there are sufficient similarities in seasonal cycles across sectors that a large seasonal cycle is present in *aggregate* output. The presence of this cycle is surprising. Seasonals in technology imply that production in certain sectors should be seasonal (for example, it is not surprising that construction falls in the winter), but it is far from obvious what *aggregate* seasonals in technology might be. Instead, it may be necessary to explain the seasonal bunching of output by means of increasing returns or other synergies combined with relatively small shifts in the productive technology.

A second similarity between cyclical and seasonal fluctuations is the tendency for output to be produced at the last minute—the absence of production smoothing.[4] The seasonal evidence against production smoothing consists of the finding that seasonals in production and sales are virtually identical in two-digit manufacturing industries.[5] This evidence is perhaps even more striking than the business cycle evidence against production smoothing because the anticipated, transitory fluctuations in demand represented by seasonals are precisely the ones that should be smoothed most easily by firms via inventory accumulations.

The third important similarity between seasonal and

[3] *R. B. Barsky and J. A. Miron, "The Seasonal Cycle and the Business Cycle," NBER Working Paper No. 2688, August 1988, and* Journal of Political Economy, *forthcoming; and J. A. Miron, "A Cross-Country Comparison of Seasonal Cycles and Business Cycles," manuscript, University of Michigan, November 1988.*

[4] *This fact has been emphasized for business cycle fluctuations by A. S. Blinder in "Can the Production-Smoothing Model of Inventories Be Saved?" NBER Working Paper No. 1257, January 1984, and* Quarterly Journal of Economics *101 (1986).*

[5] *J. A. Miron and S. P. Zeldes, "Seasonality, Cost Shocks, and the Production-Smoothing Model of Inventories," NBER Working Paper No. 2360, August 1987, and* Econometrica *56, 4 (July 1988).*

cyclical fluctuations is that increases in labor input are associated with more than one-for-one increases in output: labor productivity is procyclical. The fact that much of this procyclicality occurs between the third and fourth calendar quarters (output increases substantially without a significant increase in labor input) suggests that labor hoarding in the face of the Christmas demand shift is the most likely explanation for procyclicality at the seasonal frequencies. It seems harder to account for the seasonal variation in labor productivity by relying solely on changes in technological opportunities, which is the explanation found in real business cycle models.

A final important similarity between seasonal and cyclical fluctuations is a strong correlation between movements in nominal money and real output. The presence of this correlation over the seasonal cycle is a prime example of the endogeneity of money with respect to real output fluctuations, since it is implausible that seasonal fluctuations in output could be driven by monetary factors. The fourth quarter peak in output is more likely the result of the impulse to real spending associated with Christmas, and the comovement of money with output reflects active accommodation of the seasonal variation in output by the Fed. Indeed, a desire to eliminate the seasonal movements in interest rates was probably a primary motivation for the founding of the Fed, in addition to being one of the Fed's dominant objectives since its inception.[6] The Fed responds to the fourth quarter surge in spending by letting the nominal money supply increase just enough so that the money market clears without changes in the price level or nominal interest rates.

Interactions Between Seasonals and Cyclical Fluctuations

In the third main phase of my research on seasonality I have documented that countries with substantial amounts of seasonal variation also have substantial amounts of business cycle variation. For example, countries in which the seasonal variability of industrial production is high are also countries in which the nonseasonal variability of industrial production is high. This kind of cross-sectional relationship also holds for retail sales, the price level, the money stock, and nominal interest rates.

One issue that arises immediately is whether these cross-sectional correlations might be explained by some exogenous third factor. Consider, for example, an economy that has two sectors, one seasonal and one nonseasonal. Assume that the seasonal sector (for example, construction) displays greater cyclical variation than the nonseasonal sector (for example, services). In this setting, there will be a positive correlation between the amount of seasonal variation displayed by a particular economy and the amount of nonseasonal variation displayed by that economy. If one accounts for the share of output originating in the construction sector, however, the correlation between the amounts of seasonal and nonseasonal variation should disappear.

The cross-sectional relationship between seasonal and cyclical variation does not appear to be explained easily by some mechanism such as the one just described. I have analyzed the potential role of the degree of economic diversity, of the industrial composition of output, and of the level of economic development, and I find that there is a strong correlation across countries between the amount of seasonal variation exhibited by a country and the amount of business cycle variation exhibited by that country, even after controlling for these other country characteristics.

The cross-sectional correlation between the amount of seasonal and cyclical variation most likely results instead from having the same economic mechanism operative in producing both seasonal and cyclical fluctuations. If this is the case, then it is possible to learn about the business cycle by studying what occurs over the seasonal cycle. Since, as mentioned above, there are identifying restrictions available for the seasonal cycle that are not available for the business cycle, this is a useful new perspective on aggregate fluctuations.

Future Research

The most important results of my research to date are basic stylized facts about aggregate fluctuations: seasonal cycles are quantitatively important; their properties are similar to those of business cycles; and countries with significant seasonal cycles are also ones with significant business cycles. Some of these facts tend to refute or support particular models of aggregate fluctuations, but for the most part they are not conclusive by themselves. Therefore, the most important implication of these results is to suggest that explicitly accounting for seasonality in macroeconomic modeling and empirical work is likely to improve our understanding of the economy.

The next step in my research is to develop specific, economic models that are capable of accounting simultaneously for the seasonal and business cycle facts about the economy as well as for possible connections between seasonal and cyclical fluctuations. Perhaps the most ambitious and far-reaching question is to understand why (indeed if) we should care about business cycle fluctuations but not about seasonal fluctuations.

[6] *J. A. Miron, "Financial Panics, the Seasonality of the Nominal Interest Rates, and the Founding of the Fed,"* American Economic Review *76, 1 (March 1986), pp. 125–140; N. G. Mankiw and J. A. Miron, "The Changing Behavior of the Term Structure of Interest Rates," NBER Reprint No. 734, July 1986, and* Quarterly Journal of Economics *101, 2 (May 1986); N. G. Mankiw, J. A. Miron, and D. N. Weil, "The Adjustment of Expectations to a Change in Regime: A Study of the Founding of the Federal Reserve," NBER Reprint No. 915, October 1987, and* American Economic Review *77, 3 (June 1987); and R. B. Barsky, N. G. Mankiw, J. A. Miron, and D. N. Weil, "The Worldwide Change in the Behavior of Interest Rates and Prices in 1914," NBER Reprint No. 1115, March 1989, and* European Economic Review *32, 5 (June 1988).*

Economic Outlook Survey

First Quarter 1989

Victor Zarnowitz

According to the March survey of 17 professional forecasters taken by the NBER and the American Statistical Association, there was strong growth in real GNP over the first quarter of 1989. This will be followed by moderation in the current quarter and the next, and by sluggishness late in 1989 and during 1990. Consumer price inflation should peak at around 5 percent (annual rate) in mid-1989 and average 4.6 percent next year, presumably as a result of tight money policy and the anticipated slowdown. Interest rates similarly are expected to increase in the near future and then return to the levels observed late in 1988. The predicted declines in real growth rates will come later but will be much more drastic for business investment than for consumption. However, the risk of a recession, as assessed by most of the respondents, is increasing but still not very high.

Growth Rates Declining in 1989, Low in 1990

The median forecasts of the annual growth rates in the economy's output were 4.4 percent for 1989:1, about 2 percent for 1989:2 and 1989:3, 1.1 percent for 1989:4, and 1.4 percent for 1990:1. Real GNP is expected to gain 2.7 percent in 1988-9, which is somewhat less than the forecast from the December 1988 survey, and 1.5 percent in 1989-90.

Thus 1989 is expected to make a strong entry but a weak exit. About one-third of the panel expect growth of less than 1 percent in 1989:4, including two respondents who predict that real GNP will decline. The situation is very similar for 1989:1. However, only one survey participant forecasts a recession severe enough to cause output to fall on an annual basis in 1989-90. Output is predicted to grow between 1.5 and 3.2 percent for 1989 and between -0.4 and 2.9 percent for 1990. (The standard deviations are 0.5 percent and 0.9 percent, respectively.)

Few See a High Likelihood of a Recession

The mean probability that real activity will fall, as estimated by the forecasters, increases from 14 percent in 1989:2 to 31 percent in 1990:1. These figures are somewhat higher than their counterparts in the previous survey. A few respondents see much higher chances of a recession, but most estimates fall below the means.

The rate of unemployment is expected to creep up to 5.6 percent in 1990:1 and 5.8 percent for 1990 as a whole, according to the group's median forecasts. The means are very close, the standard deviations are 0.3 percent in both cases, and the respective ranges are 5.0-6.2 percent and 5.2-6.5 percent.

Inflation May Level Off Soon

The GNP implicit price deflator (IPD) is predicted to rise 4.5 percent in 1988-9, 4.6 percent in 1989:1-1990:1, and 4.3 percent in 1989-90. The consumer price index (CPI), which rose 4.1 percent in 1987-8, may rise by 4.8 percent in 1988-9 and by 4.6 percent in 1989-90. These average forecasts reflect little movement and certainly no acceleration of inflation. Most individual forecasts fall into the 4-5 percent interval, but there are always outliers; for example, the range for the deflator in 1990:1 is 3.7-6.1 percent. (For 1990 as a whole, the range is 3.7-5.8 percent.)

There is a concentration of high inflation forecasts in 1989:2 (for CPI) and 1989:3 (for IPD). A majority of the forecasters specify that inflation will be higher in 1990:1 than in 1989:1, but most of the differentials are small.

Probabilistic Forecasts

To assess the uncertainty associated with the point predictions, we asked the forecasters about the probabilities they attach to possible percentage changes in real GNP and the IPD. The distributions of the resulting means are as follows:

Relative Change in Real GNP	*1988-9*	*1989-90*
4.0 percent or more	9	7
2.0-3.9 percent	59	41
0-1.9 percent	27	38
Negative	5	14

Relative Change in IPD	*1988-9*	*1989-90*
8 percent or more	2	3
6.0-7.9 percent	12	13
4.0-5.9 percent	62	54
Less than 4.0 percent	24	30

The shift to lower real growth is very evident here. There is a rise in uncertainty about inflation but also a shift toward lower figures. This reverses the rise in inflation that was expected between 1988 and 1989 (as reported in last year's surveys).

Interest Rates Still Rising but Lower Next Year

The three-month Treasury bill rate will increase to 8.8 percent in 1989:3 but then decline and average 7.8 percent in 1990, according to the group's median forecasts. (In December, a lower and earlier peak of 7.7 percent in 1989:1 was predicted.) The distributions are

Projections of GNP and Other Economic Indicators, 1989-90

	Annual				
				Percent Change	
	1988 Actual	1989 Forecast	1990 Forecast	1988 to 1989	1989 to 1990
1. Gross National Product ($ billions)	4861.8	5211.0	5515.0	7.2	5.8
2. GNP Implicit Price Deflator (1982 = 100)	121.7	127.2	132.7	4.5	4.3
3. GNP in Constant Dollars (billions of 1982 dollars)	3995.0	4102.0	4164.0	2.7	1.5
4. Unemployment Rate (percent)	5.5	5.5	5.8	0.0[1]	0.3[1]
5. Corporate Profits After Taxes ($ billions)	160.9	173.0	178.0	7.5	2.9
6. Nonresidential Fixed Investment (billions of 1982 dollars)	487.2	506.5	507.4	4.0	0.2
7. New Private Housing Units Started (annual rate, millions)	1.49	1.47	1.47	-1.34[2]	-0.20[2]
8. Change in Business Inventories (billions of 1982 dollars)	42.5	30.0	28.0	-12.5[3]	-2.0[3]
9. Treasury Bill Rate (3-month, percent)	6.67	8.60	7.75	1.93[1]	-0.85[1]
10. Consumer Price Index (annual rate)	4.1	4.8	4.6	0.7[1]	-0.2[1]

	Quarterly							
		1989				1990	Percent Change	
	1988 Q4 Actual	Q1	Q2	Q3	Q4	Q1	Q4 88 to Q4 89	Q1 89 to Q1 90
		Forecast						
1. Gross National Product ($ billions)	4989.9	5094.0	5173.0	5255.0	5328.0	5409.4	6.8	6.2
2. GNP Implicit Price Deflator (1982 = 100)	123.8	125.1	126.3	127.9	129.3	130.8	4.4	4.6
3. GNP in Constant Dollars (billions of 1982 dollars)	4029.2	4074.0	4095.0	4115.0	4126.0	4140.0	2.4	1.6
4. Unemployment Rate (percent)	5.3	5.3	5.4	5.5	5.6	5.6	0.3[1]	0.3[1]
5. Corporate Profits After Taxes ($ billions)	170.6	173.0	173.0	172.0	175.0	175.5	2.6	1.4
6. Nonresidential Fixed Investment (billions of 1982 dollars)	490.4	499.7	505.4	512.2	512.9	508.1	4.6	1.7
7. New Private Housing Units Started (annual rate, millions)	1.54	1.52	1.48	1.44	1.42	1.41	-7.79[2]	-6.91[2]
8. Change in Business Inventories (billions of 1982 dollars)	29.2	40.0	32.0	28.0	27.0	28.5	-2.2[3]	-11.5[3]
9. Treasury Bill Rate (3-month, percent)	7.70	8.45	8.75	8.80	8.40	8.00	0.70[1]	-0.45[1]
10. Consumer Price Index (annual rate)	4.0	4.6	5.0	4.8	4.8	4.7	0.8[1]	0.1[1]

SOURCE: The National Bureau of Economic Research and American Statistical Association, Business Outlook Survey, March 1989. The figures on each line are medians of seventeen individual forecasts.

[1]Change in rate, in percentage points.
[2]Possible discrepancies in percentage changes are caused by rounding.
[3]Change in billions of dollars.

still skewed toward higher figures; for example, the range for 1990:1 is 7.0-11.5 percent, and for 1990 as a whole the range is 6.7-9.6 percent.

The yield on new high-grade corporate bonds is expected to rise, but slowly, to 10.3 percent in the second half of 1989. It will average slightly less that 10 percent in 1990, with almost all individual forecasts falling in the 9-11 percent interval.

Slowdown Moderate in Consumption, Sharp in Nonresidential Investment

Real consumption expenditures are projected to grow 2.5 percent in 1988-9, 1.8 percent 1989:1-1990:1, and 1.6 percent in 1989-90. The forecasts imply less of a slowdown in consumption than in total output (or real income). This mainly reflects the expectation of a developing weakness in the business sector. The inflation-adjusted gains in nonresidential fixed investment are projected to decline from double digits last year to annual rates of 7.6 percent and 4.6 percent in the first two quarters of 1989, 5.4 percent and 0.5 percent in the last two quarters of 1989, and -3.7 percent in 1990:1. The annual averages are 4 percent for 1988-9 and only 0.2 percent for 1989-90.

Housing and Inventory Investment Fairly Stable

New private housing starts are predicted to average 1.5 (annual rates in millions) in 1989:1, 1.4 in 1990:1, and slightly less than 1.5 in both years, 1989 and 1990. Real residential fixed investment is expected to gain 2.8 percent in 1988-9 and lose a little (-0.3 percent) in 1989-90.

The group forecasts a change in business inventories, in billions of 1982 dollars, of 30 for 1989 and 28 for 1990.

Small Gains in Industrial Production and Corporate Profits

Output of manufacturing, mining, and utilities should rise by 3.5 percent in 1988-9 but by only 1.4 percent in both 1989:1-1990:1 and 1989-90.

Corporate profits after taxes in current dollars are predicted to increase 7.5 percent on average in 1988-9 (not bad, but much lower than the year before). They are expected to gain only 2.9 percent in 1989-90.

Import Surplus Reduced

Net exports of goods and services in billions of 1982 dollars averaged -99 in 1988 (-101 in 1988:4). The median forecasts are -89 for 1989, -78 for 1990:1, and -70 for 1990. These figures imply that the trade deficit will continue to decline in real terms. The reduction that the forecasters expect to be achieved next year is relatively large, probably reflecting in part the depressant effect on imports of the expected retardation of growth in demand and output and in part a persistent strength of exports.

Government Expenditures and Policy Assumptions

Federal government purchases of goods and services in constant dollars are expected to grow weakly at 1.5 percent this year and to decline slightly next year. State and local purchases will rise more than federal purchases, and steadily: the median forecasts are 2.2 percent and 1.9 percent for 1988-9 and 1989-90, respectively.

Ten forecasters report that they have assumed no significant changes in tax policy; eight foresee increases in excise taxes and user fees. Five respondents see little or no change in defense outlays and ten expect decreases of 1-3 percent.

Estimates of monetary growth rates vary widely, from 1 percent to 6 percent for M1 and from 4 percent to 8 percent for M2 (using mid-points of the quoted ranges). Stable or strong oil prices are assumed by most respondents. The movements in the U.S. dollar are seen as either "moderate declines" or "stabilizing."

This report summarizes a quarterly survey of predictions by 17 business, academic, and government economists who are professionally engaged in forecasting and are members of the Business and Economics Statistics Section of the American Statistical Association. Victor Zarnowitz of the Graduate School of Business of the University of Chicago and NBER, assisted by Robert E. Allison and Deborah A. Nicholson of NBER, was responsible for tabulating and evaluating this survey.

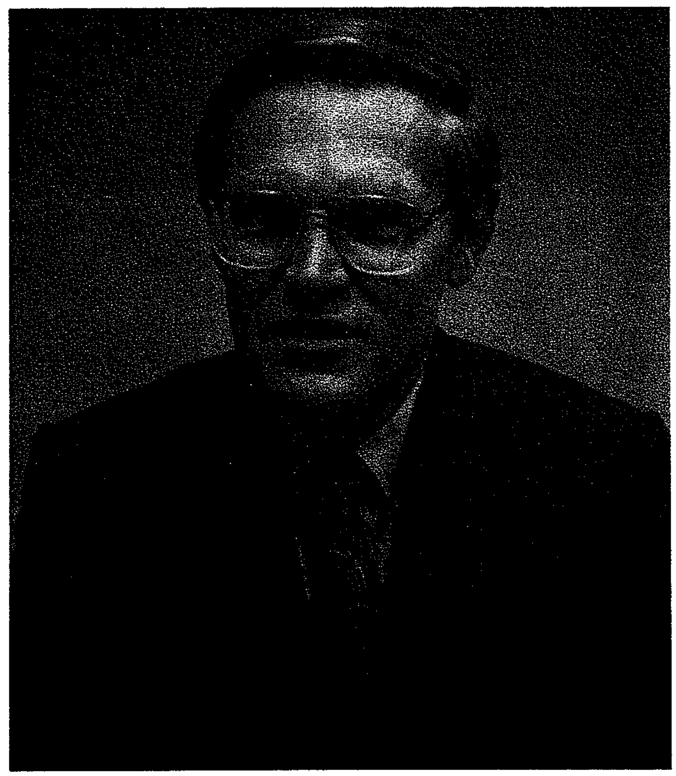
NBER Profiles

George C. Eads

George C. Eads, vice president and chief economist of General Motors, is a new member of the Executive Committee of the Board of Directors of the NBER.

Born in Clarksville, Texas, Eads received his bachelor's degree in economics from the University of Colorado in 1964 and his M.A. and Ph.D. in economics from Yale University. He has taught at Princeton and Harvard Universities.

Eads joined General Motors in 1986. Previously, he had been the Dean of the School of Public Affairs at the University of Maryland, where he had been a member of the faculty since 1981.



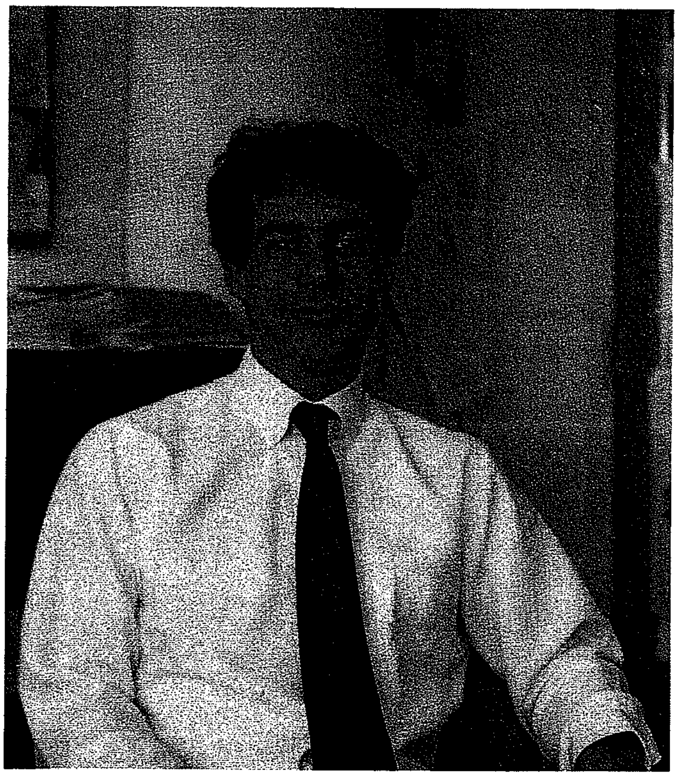
Between 1979 and 1981, Eads served as a member of President Carter's Council of Economic Advisers (CEA). Prior to joining the CEA, he founded and headed the Rand Corporation's research program in Regulatory Policies and Institutions. Before that, he served as executive director of the National Commission on Supplies and Shortages, as assistant director for Government Operations and Research of the Council for Wage and Price Stability, and as a special assistant to the Assistant Attorney General of the Antitrust Division of the U.S. Department of Justice. He also was a program manager for the National Science Foundation in Washington.

Eads has written or coauthored more than 40 articles and books. Among his most recent writings are "The Future of [Japanese] Industrial Policy" (with Kozo Yamamura); "Japanese Government Support of High Technology Industry: What Lessons for the United States?" (with Richard R. Nelson); and "Geography Is Not Destiny: The Changing Character of Competitive Advantage in Automobiles."

Eads and his wife, Maggie, have two children: Betsy and Geoffrey.

Kenneth A. Froot

Kenneth A. Froot, a faculty research fellow in the NBER's Programs in International Studies and Financial Markets and Monetary Economics, is Ford International Assistant Professor of Management at MIT. He is also an NBER Olin Fellow for 1988-9.



Froot received his B.A. in economics from Stanford University in 1980, and his Ph.D. from the University of California, Berkeley, in 1986. He has taught international and managerial economics, and macroeconomics at MIT's Sloan School since 1986.

During 1983-4, Froot served as a junior staff economist for international trade and finance at the Council of Economic Advisers. He also has been a consultant to and visiting scholar at the World Bank, the Federal Reserve Board, and the International Monetary Fund.

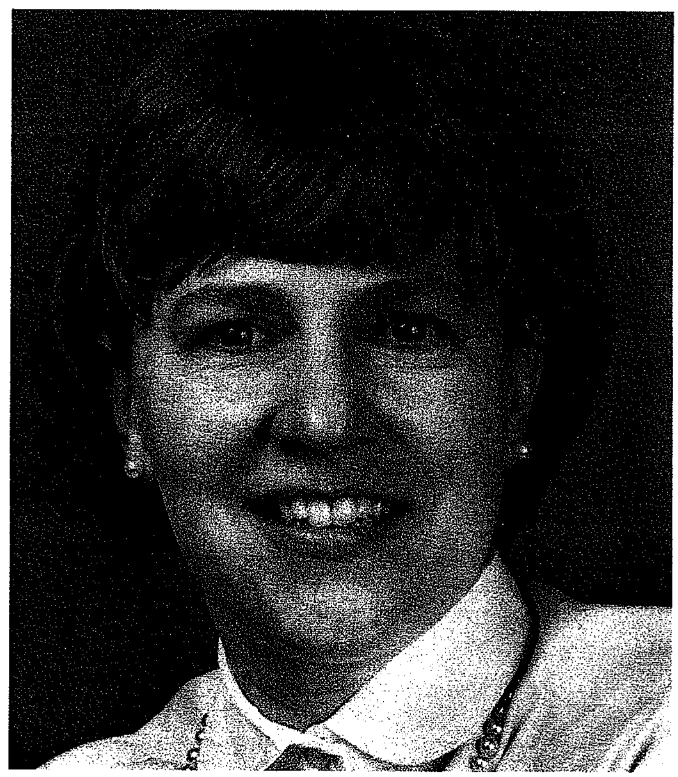
Froot's work in international economics and financial markets has been published in a number of books and professional journals. He, his wife Kathy, and their son Mark live in Cambridge. His hobbies are playing the flute and keeping up with the deterioration of his 100-year-old house.

Marjorie B. McElroy

Marjorie B. McElroy, a member of the NBER's Board of Directors since 1986, is professor of economics at Duke University. She received a B.A. in economics from Pennsylvania State University in 1965 and a Ph.D. in economics from Northwestern University in 1969.

McElroy has taught at Duke since 1970. She also has been a visiting associate professor of economics at the University of Illinois and the University of Chicago, and is currently a visiting professor at the University of Virginia.

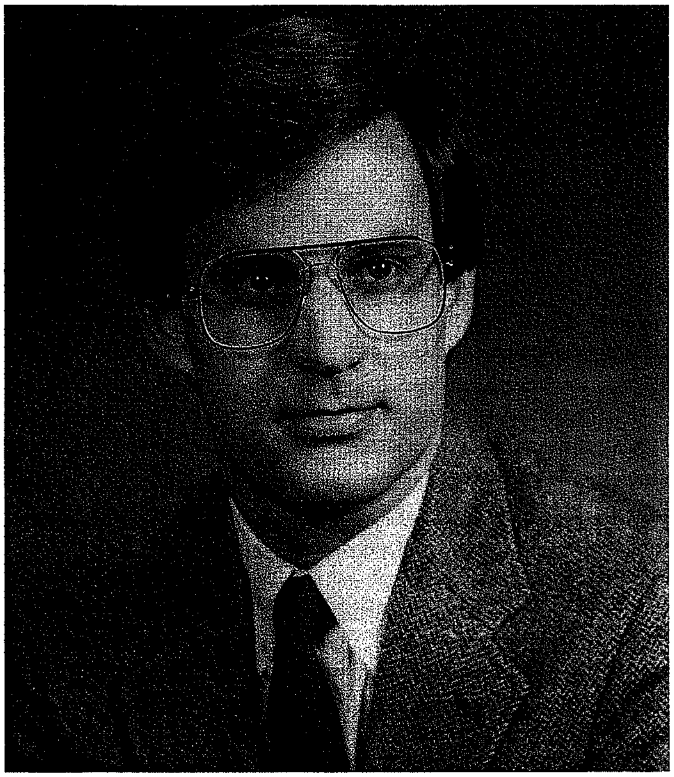
McElroy was appointed to a two-year term on the National Science Foundation Economics Advisory Panel in 1987. She is also a vice president of the Southern Economic Association. McElroy was an associate editor of *American Statistician* from 1981-7 and has written a number of journal articles in her fields of interest: demand systems, labor economics, applied econometrics, and financial economics.



McElroy is married to Edwin D. Burmeister, the Commonwealth Professor of Economics at the University of Virginia. They live in Durham, NC and Charlottesville, VA.

Jeffrey A. Miron

Jeffrey A. Miron, a faculty research fellow in the NBER's Programs in Financial Markets and Monetary Economics and Economic Fluctuations, is an assistant professor of economics at the University of Michigan. He is also an NBER Olin Fellow for the 1988–9 academic year.



Miron received a B.A. in economics and mathematics from Swarthmore College in 1979, and a Ph.D. in economics from MIT in 1984. His work in macroeconomics and finance has been published in the *American Economic Review* and a number of other journals.

Miron's hobbies are running and cooking. He is engaged to be married this June.

Conferences

Financial Markets and Macroeconomic Stability

Over 100 economists met in Cambridge on December 16 and 17 for an NBER-sponsored Universities Research Conference on "Financial Markets and Macroeconomic Stability." The conference program, organized by NBER Research Associate Ben S. Bernanke of Princeton University, was:

Bruce N. Lehmann, NBER and Columbia University, "Fads, Martingales, and Market Efficiency" (NBER Working Paper No. 2533)

Discussants: Gikas Hardouvelis, Federal Reserve Bank of New York and Columbia University, and Sanford J. Grossman, NBER and Princeton University

John Y. Campbell, NBER and Princeton University, and Albert S. Kyle, University of California at Berkeley, "Smart Money, Noise Trading, and Stock Price Behavior" (NBER Technical Working Paper No. 71)

Discussants: George G. Pennacchi, University of Pennsylvania, and J. Bradford De Long, NBER and Boston University

Valerie A. Ramey, University of California at San Diego, "Money, Trade Credit, and Output: A Test of the Real Business Cycle Hypothesis"

Discussants: Russell Cooper, NBER and University of Iowa, and David Romer, NBER and University of California at Berkeley

George Constantinides, University of Chicago, "Habit Formation: A Resolution of the Equity Premium Puzzle"

Discussants: Stephen G. Cecchetti, NBER and Ohio State University, and Rajnish Mehra, MIT

Jeffrey M. Lacker, Robert J. Levy, and John A. Weinberg, Purdue University, "A General Equilibrium Model of Incentive-Compatible Financial Contracts: Excess Stock Price Volatility and the Value of Control"

Discussants: James Kahn, University of Rochester, and Bart Taub, Virginia Polytechnic Institute

Charles W. Calomiris, Northwestern University, and Charles M. Kahn, University of Illinois, "The Role of Demandable Debt in Structuring Optimal Banking Arrangements"

Discussants: Charles Jacklin, Stanford University, and Monica Hargraves, Brown University

R. Glen Donaldson, Brown University, "Panic, Liquidity, and the Lender of Last Resort: A Strategic Analysis"

Discussants: Gary Gorton, University of Pennsylvania, and Jeffrey A. Miron, NBER and University of Michigan

Edward J. Kane, NBER and Ohio State University, "How Incentive-Incompatible Deposit Insurance Funds Fail" (NBER Working Paper No. 2836)

Discussants: Dwight M. Jaffee, Princeton University, and Lawrence White, Federal Home Loan Bank Board

In an efficient market, there should be very little systematic change in the fundamental valuation of individual firms over intervals as short as a week. However, Lehmann finds sharp evidence of market inefficiency: that is, systematic tendencies for current "winners" and "losers" in one week to experience sizable reversals in returns over the subsequent week. That tendency reflects apparent arbitrage profits, which persist even after measured security returns are corrected for thin trading, bid-ask spreads, and plausible levels of transactions costs.

Campbell and Kyle study the volatility and predictability of annual U.S. stock returns for 1871–1986. They estimate an equilibrium model of stock price behavior in which "noise traders" (whose demand for stock varies exogenously) interact with risk-averse "smart money" investors (who trade stock in order to maximize their long-run expected utility, which is assumed to be exponential). The model defines the equilibrium stock price as the present value of expected dividends, discounted at the *riskless* rate of interest, less a constant risk premium and a variable noise trading term. Based on the data, Campbell and Kyle conclude that either the discount rate for dividends is low (4 percent or less) and the constant risk premium is large, or the discount rate is relatively high (5 percent or more) and noise trading, correlated with fundamentals, increases the volatility of stock prices.

Ramey compares the relative importance of technology shocks and transaction cost shocks in explaining fluctuations in real money balances. Her model recognizes that both money and trade credit provide transaction services. Ramey finds that shocks to the relative cost of using bank transaction services are substantially more important than technology shocks to the goods industry. Thus, it is doubtful that technology shocks are the main source of the money-income correlation.

The equity premium puzzle identified by Mehra and Prescott states that the difference between the expected rate of return on the stock market and the riskless rate of interest is too large given the small variance in the growth rate of per capita consumption. Constantinides proposes that the utility of consumption in each period is a decreasing function of "habit," in which habit is an exponentially weighted sum of past consumption. This property of preferences, known as habit formation, drives a wedge between the coefficient of relative risk aversion and the intertemporal elasticity of substitution in consumption. Habit formation resolves the equity premium puzzle and also sheds light on related questions about asset prices and the consumption function.

Lacker, Levy, and Weinberg study asset prices in a model with imperfect information and assets that are productive only when they are combined with the services of a "manager," who can conceal some of the produced output, at a cost. The marketed assets closely resemble traded "equity" claims: claimants receive the resale value of their claim plus a "dividend" that is a fixed share of realized output. An asset's price can be more volatile than the present discounted value of the underlying stream of dividends because of the premium that successive generations of managers are willing to pay for the right to control the asset.

Bank-issued demandable debt (bank notes and checking accounts) requires the holding of idle reserve balances and entails occasional bank suspensions and liquidations that would not occur under other forms of finance but also creates incentives for the banker and the depositors. Calomiris and Kahn note that by allowing depositors to withdraw their funds, demandable debt encourages depositors to monitor the bank and its performance, rewarding early recognition of bank difficulties. By forcing the liquidation of banks when a critical number of depositors have withdrawn funds, demandable debt provides discipline for the banker. Since offering demandable debt limits the banker's actions, it effectively reduces the cost of obtaining funds.

Donaldson develops a model in which panics are caused by the strategic behavior of agents who temporarily "corner" the supply of privately controlled cash reserves. This results in an abrupt decline in the dollar value of noncash assets and in turn produces a dramatic decrease in securities prices, an increase in interest rates, and a wave of "contagious" bank runs that are characteristic of panics. A lender of last resort can prevent panics by ensuring that the supply of cash is sufficiently elastic to prevent corners.

Kane defines an incentive-incompatible deposit insurance fund (IIDIF) as a scheme for guaranteeing deposits at client institutions that deploys defective systems of information collection, client monitoring, and risk management. He focuses on how principal-agent conflicts and asymmetries in the distribution of information lead to myopic behavior by IIDIF managers. Drawing on data developed in legislative hearings and investigations and in depositions, he documents that managers of IIDIFs in Ohio and Maryland knew well in advance of their funds' 1985 failures that clients were both economically insolvent and engaging in inappropriate forms of risk-taking. Staff proposals for publicizing and bringing these clients' risk-taking under administrative control were rejected repeatedly. Kane concludes that Congress and federal regulators have managed the massively undercapitalized Federal Savings and Loan Insurance Corporation in much the same way that Ohio and Maryland officials managed their funds.

Conference on Saving

An NBER Conference on Saving, organized by Research Associates B. Douglas Bernheim of Northwestern University and John B. Shoven of Stanford University, was held on January 6–7. The program was:

David F. Bradford, NBER and Princeton University, "Market Value versus Accounting Measures of National Saving" (NBER Working Paper No. 2906)
Discussant: Joseph E. Stiglitz, NBER and Princeton University

James M. Poterba, NBER and MIT, "Dividends, Capital Gains, and the Corporate Veil: Evidence from OECD Nations"

Discussant: Robert E. Hall, NBER and Stanford University

Alan J. Auerbach, NBER and University of Pennsylvania, and Kevin Hassett, University of Pennsylvania, "Corporate Savings and Shareholder Consumption"

Discussant: Angus S. Deaton, NBER and Princeton University

B. Douglas Bernheim, John Karl Scholz, University of Wisconsin, and John B. Shoven, "Consumption Taxation in a General Equilibrium Model: How Reliable Are Simulation Results?"

Discussant: Joel B. Slemrod, NBER and University of Michigan

James Davies, University of Western Ontario, and John Whalley, NBER and University of Western Ontario, "Taxes and Capital Formation: How Important Is Human Capital?" (NBER Working Paper No. 2899)

Discussant: Sherwin Rosen, NBER and University of Chicago

David A. Wise, NBER and Harvard University, and Steven F. Venti, NBER and Dartmouth College, "The Net Effect of Tax-Deferred Retirement Accounts: Evidence from SIPP"

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

Lawrence H. Summers, NBER and Harvard University, and Chris Carroll, MIT, "The Growth-Saving Nexus"

Discussant: N. Gregory Mankiw, NBER and Harvard University

Susan M. Collins, NBER and Harvard University, "Savings Behavior in Ten Developing Countries"

Discussant: Anne O. Krueger, NBER and Duke University

Robert J. Barro, NBER and Harvard University, "A Cross-Country Study of Growth, Saving, and Government" (NBER Working Paper No. 2855)

Discussant: James Tobin, Yale University

Martin Feldstein, NBER and Harvard University, and Philippe Bachetta, Harvard University, "National Savings and International Investment"

Discussant: Rudiger Dornbusch, NBER and MIT

Jeffrey A. Frankel, NBER and University of California at Berkeley, "Quantifying International Capital Mobility in the 1980s" (NBER Working Paper No. 2856)

Discussant: Maurice Obstfeld, NBER and University of Pennsylvania

Bradford argues that the National Income and Product Account (NIPA) measures of saving are seriously defective as measures of economic performance and as elements of the explanation for consumption behavior. The NIPA measures are on a cost basis, while economic analysis requires valuing assets at current market price. Also, the NIPA income and saving measures exclude possibly significant elements of the change (up and down) over time in the nation's wealth stock measured by market value. After reviewing the relationship between the market value of assets and financial accounting net worth, Bradford argues that shortcomings of the market value measure do not imply that the NIPA concept is superior. Although available data on market value (the balance sheets for the U.S. economy assembled by the Federal Reserve Board) have many shortcomings, the NIPA saving and wealth measures are not good proxies for market value measures.

Poterba investigates the influence of individuals' cash receipts from corporations on saving decisions. If households base their consumption decisions solely on the market value of their assets (including human wealth), then whether a firm pays dividends, repurchases shares, or retains earnings and reinvests them in new projects should not affect spending decisions. If households are myopic or face liquidity constraints, however, then cash transactions, such as dividend payments or share repurchase, may have a greater effect on consumption than corporate reinvestment. Poterba compared data on three countries—Canada, the United Kingdom, and the United States—to test for the influence of cash payout on consumption. To identify the effect of cash flow on aggregate consumption, he focuses on tax-induced changes in corporate dividend policy and "involuntary" shareholder realizations of capital gains in takeover transactions. The results for all three countries suggest substantively important effects of corporate payout on consumer spending. They imply that part of the decrease in the U.S. personal saving rate during the 1980s may be attributable to increased corporate payout and takeover activity.

For many years, economists have believed that transfers of income from corporations to shareholders can have real effects. Implicit in this view is the idea that shareholders cannot "pierce the corporate veil," that is, recognize wealth-neutral transfers for what they are. Auerbach and Hassett find that the aggregate marginal propensity to consume from corporate wealth is small relative to the propensities to consume from other forms of wealth. They suggest that this difference is likely to reflect differences in individual marginal propensities to consume (wealthy shareholders consuming at a lower rate), rather than the presence of a corporate veil.

The taxation of capital income may have a variety of detrimental effects, including the distortion of intertemporal decisionmaking and the reduction of saving and capital accumulation. Bernheim, Scholz, and Shoven ask if we know enough about the underlying parameters in large-scale general equilibrium models to have any confidence about the predicted effects of consumption taxes in these models. Their results are mixed. If the precise underlying parameters are known, then many aspects of the simulation will be accurate. In particular, the calculated welfare gain is roughly three times the size of its estimated standard error. Results based upon pessimistic beliefs are much less encouraging. In this case, the welfare gain is only about one and a half times the size of its standard error.

Davies and Whalley ask how the analysis of the effects of taxes on capital formation changes when human capital is incorporated explicitly. They find that estimates of the intertemporal distorting costs of taxes are affected very little by including human capital. While removing these tax distortions increases savings more when human capital is endogenous and there is a move from an income tax to a consumption or wage tax, the net-of-tax rate of return on nonhuman capital is largely unchanged in the long run because of interasset substiution between human and nonhuman capital. Thus, static partial equilibrium analysis focusing on how human capital changes the analysis of tax distortions of savings can be misleading when compared to full dynamic equilibrium analysis that captures endogenous effects on interest rates through interasset substitution effects.

Using data from the Survey of Income and Program Participation (SIPP), Wise and Venti find that the typical American family has very little financial asset saving: the median of family financial assets including stocks and bonds was only $600 in 1985. (The household median was $1600.) The majority of saving for most families is in the form of housing. However, there is no evidence of substitution of IRAs for other saving, and no evidence that IRAs have been funded by borrowing. If the IRA limit were increased, their analysis suggests, almost two-thirds of the increase in IRA contributions would come from reduced consumption and almost one-third from reduced taxes. Underlying this finding is the fact that the typical family's IRA contribution was much greater than what the family had been saving prior to the introduction of IRAs, as judged by the accumulation of assets. Even the accumulated financial assets of most families were not large enough to support much transfer to IRAs, if any balance at all were to be maintained as precautionary saving for unexpected contingencies.

Summers and Carroll argue that both permanent-income, and to lesser extent, life-cycle theories are inconsistent with the grossest features of cross-country data on consumption, income, and saving. Accounting for the observed behavior of consumption and income requires an alternative theory that preserves the predictions about cross-sectional and high-frequency macro relationships but offers low-frequency predictions that are consistent with the data.

Collins examines saving behavior in ten developing Asian countries. Some of these countries (such as South Korea) currently have very high saving rates, but this is a recent development. There has been a dramatic and widespread rise in saving as a share of income since the early 1960s. Collins shows that the countries with the highest saving rates in the 1980s were also the ones with the fastest real growth rates during 1960–84 and the ones that underwent a large shift in their age distributions—from over 40 percent of the population under the age of 15 to barely 30 percent. She also finds that most of the increase in aggregate saving has been by firms and households, and that the government does not account for the large increase in saving—at least not directly. Furthermore, in Korea older households have increased their saving even more than younger and middle-aged households. These findings call into question the life-cycle model for explaining trends in saving behavior.

Barro studies the effects on per capita growth, investment in physical and human capital, and population growth of various aspects of government policy—including public infrastructure services, maintenance of property rights, government consumption, and taxation. He uses a cross-country sample with information about the composition of government expenditures, proxies for economic freedom and property rights, and measures of political stability. Barro finds that government consumption and investment spending, and proxies for economic freedom, have the expected effects. Also, the interplay among population growth, investment in human capital (school enrollment), and the initial level of per capita income confirm theoretical predictions about the trade-off between the quantity and "quality" of children.

Feldstein and Bachetta report new estimates of the effect of international differences in saving rates on domestic rates of investment. They find that the proportion of domestic saving that remains in the domestic economy continued to be high in the 1980s although this "savings retention rate" may have declined as international capital markets became more fully integrated. They also suggest that the association between domestic saving and domestic investment cannot be interpreted as the result of endogenous budget deficits. Additional evidence on the dynamics of the saving-investment adjustment process indicates that domestic investment rates respond with a lag to shifts in domestic saving while domestic saving rates are not sensitive to shifts in desired domestic investment.

Frankel uses a new dataset of forward exchange rates for 25 countries to show that a continuing worldwide trend of integration of financial markets in the 1980s had all but eliminated short-term interest differentials for major industrialized countries by 1988. Only the *country premium* has been eliminated, however; this means that only *covered* interest differentials are small. Nominal and real exchange rate variability remain, and indeed were larger in the 1980s than in the 1970s. The result is that a *currency premium* remains, consisting of an exchange risk premium plus expected real currency depreciation. The existence of expected real depreciation means that, even if interest rates are equalized internationally when expressed in a common currency, large differentials in *real* interest rates remain. Investors have no incentive to arbitrage away such differentials. Because there is no force tying the domestic real interest rate to the world real interest rate, it follows that there is no reason to expect any country's shortfalls of national saving to be completely financed by borrowing from abroad.

Fumio Hayashi, NBER and University of Pennsylvania, also attended the conference.

Labor Relations and the Firm: Comparative Perspectives

A conference on "Labor Relations and the Firm: Comparative Perspectives" was held on January 7–8 in Tokyo. The conference, sponsored jointly by the NBER, the Tokyo Center of Economic Research, and the Centre for Economic Policy Research, was organized by Masahiro Okuno-Fujiwara, University of Tokyo, and Takatoshi Ito, NBER and University of Minnesota. The program was:

David Begg, Dennis J. Snower, and Chris Martin, University of London, and Assar Lindbeck, University of Stockholm, "On the Persistence of Labor Market Shocks"

Discussants: Akira Ono, Hitotsubashi University, and Hiroshi Yoshikawa, University of Tokyo

Susan N. Houseman, University of Maryland, and Katharine G. Abraham, NBER and University of Maryland, "Employment and Hours Adjustments: A Sectorial Analysis"

Discussants: Konosuke Odaka, Hitotsubashi University, and Tadashi Yamada, NBER and University of Tsukuba

Yoshio Higuchi, Keio University, "Changes in Wage Differentials over the Business Cycle"

Discussants: Masanori Hashimoto, Ohio State University, and Isao Ohashi, Nagoya University

Richard B. Freeman, NBER and Harvard University, and Mark Rebick, Harvard University, "Crumbling Pillar? Declining Union Density in Japan"

Discussants: John B. Taylor, NBER and Stanford University, and Kazuo Koike, Hosei University

Isao Ohashi, "On the Determinants of Bonuses and Basic Wages in the Japanese Large Firms"

Discussants: Masanori Hashimoto, and Kuramitsu Muramatsu, Nanzan University

Takatoshi Ito, and Kyoungsik Kang, University of Minnesota, "Bonuses, Overtime, and Employment: Korea versus Japan"

Discussants: Akira Ono and John B. Taylor

Masahiko Aoki, Kyoto University, "On a Symmetry of Financial and Internal Controls at the Japanese Firm"

Discussants: Michael H. Riodan, Boston University, and David Ulph, Bristol University

Yoshitsugu Kanemoto, University of Tokyo, and W. Bentley MacLeod, Queen's University, "Optimal Labor Contracts with Noncontractible Human Capital"

Discussants: Hajime Miyazaki, Ohio State University, and Alistair Ulph, University of Southampton

Masahiro Okuno-Fujiwara, "On Labor Incentive and Work Norm in Japanese Firms"

Discussants: Hajime Miyazaki and Michael H. Riodan

Alistair Ulph and David Ulph, "Labor Markets and Innovation"

Discussants: Richard B. Freeman, and Haruo Shimada, Keio University

Lawrence F. Katz, NBER and Harvard University, and Ana L. Revenga, Harvard University, "Changes in the Economic Rewards to Higher Education: The United States versus Japan"

Discussants: Hiroshi Yoshikawa, University of Tokyo, and Susan N. Houseman

Begg, Snower, Martin, and Lindbeck examine the persistence of labor market shocks within the framework of the insider-outsider family of models. They distinguish between symmetric persistence, in which the magnitude of response is the same for positive and negative shocks of equal magnitude, and asymmetric persistence, in which there is a different response in upswings and downswings. Using annual U.K. data, they find significant differences in response to upswings and downswings. Specifically, small upswings lead entirely to higher wages. Larger upswings lead to both higher wages and new hiring. In contrast, downswings immediately lead to reductions in both employment and wages.

Houseman and Abraham find that U.S. manufacturing industries adjust employment levels to changes in demand significantly more than Japanese industries do. The adjustment of average hours of total labor input is significantly greater in U.S. manufacturing than in Japanese. In the United States, employment adjustment falls much more on production workers than on nonproduction workers, while in Japan the employment effects on production and nonproduction workers are not significantly different. However, female workers in Japan bear a disproportionate share of employment adjustment.

Higuchi explores changes in the tenure-wage slope over the business cycle. Labor mobility is lower in Japan than in the United States and other western countries, which suggests that Japanese employees are likely to be protected from external market developments. However, Higuchi finds that both the average wage and the tenure-wage slope are influenced not only by changes in each firm's profits but also by changes in the external labor market.

Freeman and Rebick examine the recent decline in union density in Japan. From 1974, when 34 percent of employees were organized, to the present when 27 percent are organized, the fall in density has averaged 0.5 percentage points per year. They first consider structural explanations for this phenomenon, including the expansion of low-density industrial sectors, the increased labor force participation of women, and the increased use of part-time and temporary contract labor. These structural shifts account for only one-third of the drop in density. Most of the drop is explained by the decrease in union density among male, regular-contract workers *within* industries. Most of the non-structural decline was caused by a drop in the rate at which new unions are being organized (rather than an increase in the rate at which unions are going out of existence). This is similar to trends in the United States.

The bonus system plays a key role in explaining the Japanese labor market, particularly its flexible compensation . Ohashi proposes that bonuses are paid by firms to compensate employees for the intensity of their work in the last period. He finds that, although both bonuses and wages are strongly influenced by labor market conditions, the former is basically a reward for past work intensity and the latter is compensation for organizational elements.

Ito and Kang also examine bonuses and wages, both of which respond to economic conditions more in Korea than in Japan. The "overtime" component of the wage responds to economic conditions less than bonuses but more than wages.

The literature on contracting views the control of firm activities as layered hierarchically with stockholder's control at the apex. Aoki examines the symmetric structure that exists at Japanese firms between bank control over strategic decisions and management control over operating activities. This structure poses an anomaly to the contracting orthodoxy.

According to Kanemoto and MacLeod, the market for specific human capital is incomplete and institutions have evolved to deal with this problem. Since investment in human capital cannot be legally contracted, the optimal contract must include a lifetime employment (LTE) institution with both LTE workers and temporary workers. The optimal contract for an LTE worker is a promotion scheme under which the probability of getting promoted is (almost) 100 percent. When the demand for the firm's product fluctuates over time, there will be a trade-off between LTE workers and temporary workers.

Okuno-Fujiwara analyzes the role of a work norm in firms and society. A firm that establishes a cooperative norm can generate rents by persuading its employees to work harder. For this mechanism to operate, two aspects of Japanese labor relations must be present: first, job rotation and multifunctionality of workers make the evaluation of fellow workers' efforts easier, which is essential to management for identifying deviations from the existing work norm. Second, there is a possibility of dismissal even (and especially) for senior workers, contrary to the usual perception. This possibility creates an incentive to follow the work norm.

Ulph and Ulph explore the impact of different labor market institutions on the incentives for firms to undertake R and D. Their model predicts that allowing bargaining between producers and workers over the timing of an innovation never helps a country to innovate. It may lead to the loss of a patent by a country that otherwise might have won it. This would make the work force worse off than if it had simply allowed immediate introduction of the technology. Ulph and Ulph estimate a simple model of the determination of R and D expenditures for the United Kingdom. They find that union density has a negative effect on R and D expenditures in high-technology, high-profit industries. The extent to which bargaining is at the local rather than the national level has a marked negative impact, perhaps because the more local the bargaining, the more influence unions will have over the introduction of new technology.

Katz and Revenga examine movements in the structure of wages in the United States and Japan in the 1980s. They find that the earnings of college graduates have increased dramatically relative to those of less-educated workers in the United States since the late 1970s. Educational wage differentials for most demographic groups have increased slightly on average in Japan over the same period. Katz and Revenga find that larger product demand shifts away from industries that have traditionally employed less-educated workers (particularly durable goods manufacturing) and a smaller increase in the relative supply of college graduates in the United States than in Japan both help to explain the much sharper increase in educational wage differentials in the United States.

International Aspects of Taxation

An NBER Conference on International Aspects of Taxation, organized by Research Associates Joel B. Slemrod, University of Michigan, and Assaf Razin, Tel Aviv University and the International Monetary Fund, took place on February 23-25. The program was:

Hugh J. Ault, Boston College, and David F. Bradford, NBER and Princeton University, "An Overview of the U.S. System for Taxing International Income after the Tax Reform Act of 1986"

Discussant: Daniel J. Frisch, Institute for International Economics

Roger H. Gordon, NBER and University of Michigan, and James A. Levinsohn, University of Michigan, "The Linkage between Domestic Taxes and Border Taxes"

Discussant: John Whalley, NBER and University of Western Ontario

Assaf Razin, and Efraim Sadka, Tel Aviv University, "Integration of the International Capital Markets: The Size of Government and Tax Coordination" (NBER Working Paper No. 2863)
Discussant: Jack Mintz, Queen's University

John Douglas Wilson, Indiana University at Bloomington, "The Optimal Taxation of Internationally Mobile Capital in an Efficiency Wage Model"
Discussant: Lawrence F. Katz, NBER and Harvard University

Jean-Thomas Bernard, Université Laval (Quebec), and Robert Weiner, Brandeis University and Harvard University, "Multinational Corporations, Transfer Prices, and Taxes: Evidence from the U.S. Petroleum Industry"
Discussant: Lorraine Eden, Carleton University

James R. Hines, Jr., NBER and Princeton University, and R. Glenn Hubbard, NBER and Columbia University, "Coming Home to America: Dividend Repatriations by U.S. Multinationals" (NBER Working Paper No. 2931)
Discussant: Mark A. Wolfson, Harvard University

Joosung Jun, Yale University, "U.S. Tax Policy and Direct Investment Abroad"
Discussant: Michael Dooley, International Monetary Fund

Joel B. Slemrod, "Tax Effects on Foreign Direct Investment in the United States: Evidence from a Cross-Country Comparison"
Discussant: David G. Hartman, NBER and Data Resources, Inc.

Martin Feldstein, NBER and Harvard University, and Paul R. Krugman, NBER and MIT, "International Trade Effects of Value-Added Taxation"
Discussant: Avinash K. Dixit, Princeton University

Krister Andersson, Kenji Aramaki, A. Lans Bovenberg, and Sheetal K. Chand, International Monetary Fund, "Tax Incentives and International Capital Flows: The Case of the United States and Japan"
Discussant: Alan J. Auerbach, NBER and University of Pennsylvania

Jacob A. Frenkel, NBER, University of Chicago, and International Monetary Fund, Assaf Razin, and Steven Symansky, International Monetary Fund, "International Spillovers of Taxation" (NBER Working Paper No. 2927)
Discussant: Willem H. Buiter, NBER and Yale University

Ault and Bradford describe the basic legal rules that govern the taxation of international transactions. They focus on the changes made by the Tax Reform Act of 1986. In the tax legislative process, international tax policy has been a kind of stepchild: the international aspects of domestic tax changes often are considered late in the day and without full examination. As a result, the U.S. tax system has developed without much attention to international issues. Ault and Bradford attempt to step back and look at the system that has evolved from this haphazard process.

Gordon and Levinsohn study the optimal coordination between domestic taxation and both tariff and nontariff trade policies. They show that under optimal policy, when small open economies choose to tax domestic production rather than domestic consumption of particular goods, those economies also want to tax imports, or subsidize exports, of these goods. If each good can be taxed separately, no net trade distortions should remain in spite of the use of tariffs. If the set of tax instruments is more limited, perhaps because of excessive administrative costs of extra tax instruments, then trade will be distorted. If production is taxed but tariffs are not available, perhaps because of GATT restrictions, then nontariff barriers would decrease distortions, even if foreign firms receive the rents arising from the difference between domestic and foreign prices. These nontariff barriers likely would be higher than the optimal tariff barriers. Gordon and Levinsohn also examine IMF financial statistics for 30 countries from 1970–87 to measure the size and pattern of net trade distortions. The data suggest that net trade distortions in poorer countries are much smaller than tariff data alone would suggest. In richer countries, however, production taxes, such as a corporate income tax, serve to discourage trade.

Integration of international capital markets has become a key policy issue with the prospective integration of Europe in 1992. Razin and Sadka theoretically analyze the effects of relaxing restrictions on the international flow of capital on: the optimal provision of public goods; the structure of taxation; income redistribution policies; and the scope of tax coordination. They find that, with no administrative barriers to capital flows, the optimal policy equates the domestic rate of return to the world rate and taxes income from investment abroad and from investments at home at the same rate. Any partial relaxation of the restrictions on international capital flows improves welfare. The cost of public funds falls, and the supply of public goods rises, if restrictions on international capital flows are relaxed. The amount of income redistribution increases with the liberalization of the international capital market. Finally, some minimal degree of tax coordination (such as origin-based or source-based tax schemes) is essential for the existence of an equilibrium in an integrated economy.

Wilson investigates the optimal taxation of internationally mobile capital in a two-sector model with internationally traded goods. Drawing on the efficiency wage literature, he assumes that a worker supervision problem exists in the "primary sector," but not in the "secondary sector." To discipline workers, primary sector firms pay their workers higher wages than similar workers in the secondary sector receive. In some cases, there may be a role for commodity taxes or subsidies. However, Wilson shows that the case for subsidizing capital investment in "good jobs" appears rather dubious.

Bernard and Weiner analyze transfer prices, using data on U.S. oil imports from 1973–84. They find that transfer and arm's-length prices differ significantly for oil originating in some countries, but not for all oil. The average difference represents 2 percent or less of the value of the crude oil imported by multinational companies each year. Further, the observed differences between arm's-length and transfer prices are not explained easily by average effective tax rates in exporting countries. These results provide little support for the claim that multinational petroleum companies set their transfer prices to evade taxes.

The foreign earnings of U.S. corporations typically are subject to taxation by both host foreign governments and the U.S. government. Hines and Hubbard analyze the tax incentives on foreign subsidiaries of American multinational corporations to their parent corporations in the United States who wish to repatriate profits. These incentives appear to be inconsistent with historical repatriation patterns from aggregate time-series data on the overseas operations of U.S. multinationals. To resolve this inconsistency, Hines and Hubbard examine data collected from tax returns for 1984 on financial flows from 12,041 foreign subsidiaries to their 453 U.S. parent corporations. They find that most subsidiaries paid no dividends to their parents in 1984, and that the U.S. government collected very little revenue on their foreign income while distorting their internal financial transactions.

Jun shows that U.S. tax policy can have significant effects on outflows of U.S. direct investment. He investigates various channels through which domestic tax policy can affect these investment flows. The evidence shows that U.S. tax policy toward U.S. domestic investment has an important effect on outflows of direct investment by influencing the relative net rate of return between the United States and foreign countries.

Slemrod examines the impact of U.S. and foreign taxation on foreign direct investment (FDI) in the United States. He first extends and updates the standard model of aggregate FDI in the United States and then disaggregates FDI by the country of the investing firm. This disaggregation allows a detailed examination of the effect on FDI of the rate of tax imposed by the investor's country and the impact of the home country's system of taxing foreign-source income (that is, whether it exempts or taxes foreign-source income). The results generally support a negative impact of U.S. effective tax rates on total FDI and transfers of funds, but not on retained earnings of foreign branches and subsidiaries. However, the results do not provide strong evidence that the tax responsiveness of investment from countries that exempt foreign-source income from domestic taxation differs substantially from the tax responsiveness of investment from countries that tax their residents' worldwide income.

Feldstein and Krugman discuss the effects of a value-added tax (VAT) in an open economy. A frequently heard view of American manufacturers and policy analysts is that a VAT would help U.S. exports because the tax is rebatable on American exports and levied on foreign imports. Economists generally reject this argument in favor of the proposition that a VAT with border taxes and rebates induces a real appreciation of the dollar that would leave the net prices received by producers and paid by U.S. consumers unchanged. Feldstein and Krugman reject both of these arguments. They point out that, in practice, a VAT would exempt housing and many services. As such, it would encourage American households to increase their consumption of services and decrease their consumption of tradable manufactured products, including imports. The reduction in imports eventually means a corresponding reduction in exports. A practical VAT thus is not neutral but tends to reduce both exports and imports.

Bovenberg et al. explore how the tax treatment of investment and saving affects international capital flows as well as national and global welfare. They evaluate the international effects of capital income taxes on portfolio investment in the United States and Japan. During the 1980s, these taxes encouraged capital flows to the United States both by favoring investment in that country and by discouraging relative savings in the United States.

Frenkel, Razin, and Symansky note large differences in tax rates and structures among the seven major industrial countries. They analyze the consequences of revenue-neutral conversions between income and consumption (VAT) tax systems. The effects of such changes in the composition of taxes depend critically on international differences in saving and investment propensities, which in turn govern the time profile of the current account of the balance of payments. The international effects of budget deficits and management of public debt also depend critically on whether the government manages its deficit through alterations in income or consumption taxes. Finally, the effect of harmonization depends critically on the intercountry differences in saving and investment propensities. These differences yield conflicts of interest in the tax harmonization program.

In addition to the authors and discussants, Geoffrey Carliner, NBER, and David Holland, Department of Finance, Canada, attended the conference.

Fourth Annual Conference on Macroeconomics

The NBER's Fourth Annual Conference on Macroeconomics, organized by NBER Research Associates Olivier J. Blanchard of MIT and Stanley S. Fischer of

MIT and the World Bank, was held in Cambridge on March 10–11. Over 70 economists participated in the following program:

Charles Bean, London School of Economics, and James Symons, University College, London University, "Ten Years of Mrs. T."
Discussants: William Nordhaus, NBER and Yale University, and Walter Eltis, National Economic Development Office, London

Frank Levy, University of Maryland, "Recent Trends in U.S. Earnings and Family Incomes"
Discussants: Kevin Murphy, NBER and University of Chicago, and Lawrence H. Summers, NBER and Harvard University

Christina Romer and David Romer, NBER and University of California at Berkeley, "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz"
Discussants: Anna J. Schwartz, NBER, and Benjamin M. Friedman, NBER and Harvard University

James H. Stock, NBER and Harvard University, and Mark W. Watson, NBER and Northwestern University, "New Indexes of Coincident and Leading Economic Indicators"
Discussants: Christopher A. Sims, NBER and University of Minnesota, and Victor Zarnowitz, NBER and University of Chicago

John Y. Campbell, NBER and Princeton University, and N. Gregory Mankiw, NBER and Harvard University, "Consumption, Income, and Interest Rates: The Euler Equation Approach Ten Years Later"
Discussants: Lawrence J. Christiano, NBER and Federal Reserve Bank of Minneapolis, and Albert Ando, NBER and University of Pennsylvania

Stephen Williamson, Federal Reserve Bank of Minneapolis, "Restrictions on Financial Intermediaries and Implications for Aggregate Fluctuations: Canada and the United States, 1870–1913"
Discussants: Mark Gertler, NBER and University of Wisconsin, and Lawrence White, Federal Home Loan Bank Board

Kevin M. Murphy, Andrei Shleifer, and Robert W. Vishny, NBER and University of Chicago, "Building Blocks of Market-Clearing Business Cycle Models"
Discussants: Edward C. Prescott, University of Minnesota, and Peter Diamond, MIT

Some commentators have proclaimed that Britain has undergone an "economic miracle" under Mrs. Thatcher. Inflation has been brought down to a low and relaively stable level and Britain has moved from the bottom of the productivity growth league to the top among OECD countries. However, there have been costs: unemployment has been high (although it has begun to fall at last) and the earnings distribution has widened markedly. Bean and Symons argue that during the 1970s income policies and neocorporatist machinery were used to maintain a cooperative, low-employment equilibrium in the face of considerable union power. In the 1980s, a shift toward direct measures at limiting union power, together with tight macroeconomic policies, led to increased unemployment. Its persistence throughout the decade was caused by the effect of prolonged unemployment on search behavior. The reduction in union power also helps to explain the acceleration in productivity growth. The craft nature of much of the British union movement has led to a multiplication of bargaining units within firms. Bargaining in isolation, a union can perceive overmanning and other restrictive practices as being in its interest, resulting in low wages and productivity. A fall in union power results in a reduction in these inefficiencies and leads to a rise not only in productivity but also in wages. Bean and Symons confirm that the productivity acceleration has been greatest where multiunionism is present. They also show how this explains the widening in pretax as well as aftertax earnings.

Levy reviews and proposes explanations for recent changes in the distributions of male and female earnings and of family incomes. Between 1973 and 1986, the proportion of prime age men earning \$20,000–\$50,000 (in 1987 dollars) declined while the proportions earning less than \$20,000 and more than \$50,000 both increased. Similarly, the proportion of families with incomes of \$10,000–\$50,000 declined while the proportions with incomes below \$10,000 and above \$50,000 both increased. By contrast, the earnings of prime age women generally improved; a smaller share now earn less than \$10,000 and an increased proportion earn over \$20,000. Levy suggests that the distribution of male earnings was shaped by the slow growth of labor productivity and a decline in manufacturing employment, which sharply reduced the relative earnings of young, less-educated men. Female earnings also were affected by slow productivity growth, but this was partially offset by increased occupational mobility. The family income distribution was shaped by the slow growth of individual earnings, a growing split between two-earner and female-headed families, and rising average incomes among elderly families.

Do monetary disturbances have important real effects? It is virtually impossible to answer the question without knowing whether monetary changes occur *because* of output movements or for independent reasons. However, a large amount of nonstatistical information can be used to identify episodes in which there were large monetary disturbances not caused by output fluctuations. The Romers investigate what can be learned about the effects of monetary shocks by using the historical record to isolate such episodes. They identify a series of episodes in which the Federal Reserve in effect decided to attempt to create a recession to reduce inflation; the decision to tighten policy in October 1979 represents the most recent and best-known of these shifts in policy. A shift to anti-inflationary policy led, on average, to a rise in the employment rate of two percentage points, and that effect was highly statistically significant. Economic events in the wake of these policy shifts provide compelling evidence of the importance of monetary policy. The Romers reach three other major conclusions: first, the real effects of these monetary disturbances are highly persistent; there appears only a slight tendency for economic activity to return toward its preshock path. Second, the six shocks identified account for a considerable fraction of postwar economic fluctuations, which strongly suggests that aggregate demand disturbances as a whole are the dominant source of postwar output movements. Third, evidence from the interwar era also suggests that monetary disturbances have large real effects.

The system of Leading and Coincident Economic Indicators currently maintained by the U.S. Department of Commerce was developed over 50 years ago as part of the NBER's research on business cycles. Stock and Watson report the results of an ongoing NBER-sponsored project that uses recent developments in econometric methodology and computing technology to take a new look at this system. For a detailed description of the Stock-Watson research, see their article in the "Research Summaries" section of this issue.

Campbell and Mankiw propose that the time-series data on consumption, income, and interest rates are best viewed as generated by two types of consumers—one consuming permanent income and the other consuming current income. They show that: 1) expected changes in income are associated with expected changes in consumption; 2) expected real interest rates are not associated with expected changes in consumption; and 3) periods in which consumption is high relative to income are typically followed by high growth in income. Campbell and Mankiw argue that the failure of the strict permanent-income hypothesis —and, in particular, the excessive importance of current income for consumption—indicates that economists should not turn so readily to the permanent-income hypothesis when thinking about economic policy. This conclusion applies especially to the debate over the national debt. Since the Ricardian equivalence proposition relies on the permanent-income hypothesis, the failure of that hypothesis casts doubt on this proposition's empirical validity. The old-fashioned Keynesian consumption function therefore may provide a better benchmark for analyzing fiscal policy than does the model with infinitely lived consumers.

Williamson notes two important differences in monetary and banking arrangements between Canada and the United States from 1870–1913. First, Canada had a branch banking system with larger and better diversified banks than in the U.S. unit banking system. Second, Canadian banks could issue large denomination notes with no restrictions on their backing, while all U.S. currency was essentially an obligation of the U.S. government. Also during the period, the United States experienced recurrent waves of disruptive bank failures and banking panics, while bank failures were far less disruptive in Canada, and there were virtually no widespread banking panics. Williamson constructs a general equilibrium model with endogenous financial intermediation that captures these historical Canadian and American monetary and banking arrangements as special cases. With a unit banking restriction, banks have a positive probability of failing; a phenomenon corresponding to a bank run occurs in the event of a bank failure; and aggregate bank failures are negatively correlated with aggregate output. Without this restriction, banks diversify perfectly and they never fail. In an apparent contradiction of conventional wisdom, the unit banking restriction induces *less* volatility in output, prices, and intermediary liabilities, in a business cycle driven by shocks to the riskiness of investment. A restriction on the issue of private bank notes also makes key aggregates less volatile. The predictions of the model are supported by aggregate annual data for the United States and Canada.

Murphy, Shleifer, and Vishny compare "real business cycle" and increasing returns models of economic fluctuations. In these models, business cycles are driven by productivity changes resulting either from technology shocks or from movements along an increasing returns production function. They stress four crucial components that make it possible for both types of models to fit the data: durability of goods; specialized labor; imperfect credit; and elastic labor supply. When goods are durable, large output movements result from only small changes in productivity. Specialized labor and imperfect credit generate strong positive comovement of both outputs and labor inputs across sectors of the economy. Such comovement in fact is a feature of U.S. business cycles; it does not easily obtain with mobile labor and perfect credit. Finally, elastic labor supply generates large movements in employment response to small changes in real wage. Murphy, Shleifer, and Vishny conclude that the increasing returns model is easier to reconcile with the data than the real business cycle model.

As in past years, these papers and the discussions that followed them will be published by the MIT Press as *NBER Macroeconomics Annual 1989*. Its availability will be announced in a future issue of the *NBER Reporter*.

Stock Market Volatility and the Crash

The NBER held a conference on "Stock Market Volatility and the Crash" on March 16–18. Sanford J. Grossman, NBER and Princeton University, organized the following program:

Mervyn A. King, NBER and London School of Economics, and Sushil Wadhwani, London School of Economics, "Transmission of Volatility between Stock Markets" (NBER Working Paper No. 2910)
Discussants: Douglas W. Diamond, University of Chicago, and James M. Poterba, NBER and MIT

Robert H. Litzenberger, University of Pennsylvania, and Michael J. Barclay and Jerold B. Warner, University of Rochester, "Private Information, Trading Volume, and Stock Return Variances"
Discussant: Kenneth R. French, NBER and University of Chicago

Hans R. Stoll, Vanderbilt University, and Robert E. Whaley, Duke University, "Stock Market Structure and Volatility"
Discussant: Paul Pfleiderer, Stanford University

G. William Schwert, NBER and University of Rochester, "Stock Volatility and the Crash of 1987"
Discussant: Robert F. Engle III, NBER and University of California at San Diego

Kenneth J. Singleton, NBER and Stanford University, "Disentangling the Effects of Noise and Aggregate Economic Disturbances on Daily Stock Price Volatility"
Discussant: John Y. Campbell, NBER and Princeton University

Fischer Black, NBER and Goldman Sachs, "Mean Reversion and Consumption Smoothing"
Discussant: Robert Stambaugh, University of Pennsylvania

George Constantinides, University of Chicago, "Habit Formation: A Resolution of the Equity Premium Puzzle"
Discussant: Michael Brennan, University of California at Los Angeles

Robert J. Barro, NBER and Harvard University, "The Stock Market and Investment"
Discussant: Lawrence H. Summers, NBER and Harvard University

Ben S. Bernanke, NBER and Princeton University, "Clearing and Settlement during the Crash: A Perspective from the Theory of Financial Intermediation"
Discussants: Douglas W. Diamond, and Franklin Edwards, Columbia University

Lawrence Harris, University of California at Los Angeles and Securities and Exchange Commission, "The Economics of Cash Index Alternatives"
Discussant: Richard Bookstaber, Morgan Stanley

King and Wadhwani investigate why, in October 1987, almost all the world's stock markets fell together despite widely differing economic circumstances in the various countries. They suggest that "contagion" among markets occurs as rational agents attempt to infer information from price changes in other markets. This provides a channel through which a "mistake" in one market can be transmitted to other markets. Hourly stock price data from New York, Tokyo, and London during an eight-month period around the crash support the contagion model. In addition, the magnitude of the contagion coefficients increases with volatility.

Litzenberger, Barclay, and Warner study the Tokyo Stock Exchange to learn more about the determinants of variances in stock prices. They find that when the Exchange is open on Saturday, the weekend variance is roughly 60 percent higher than when it is closed. However, weekly variances are not increased by Saturday trading because the increases in weekend volume and variance are offset by lower volume and variance on surrounding days. Thus Saturday trading changes the timing of trades, and variance is affected by private information revealed through trading. U.S. stocks traded in Tokyo, or Japanese stocks traded on the New York Stock Exchange, have increased trading hours, but the trading of stock on a foreign exchange is typically light relative to domestic volume. The increased trading hours are not associated with an increase in the variance of stock prices. This suggests that substantial volume is required for private information to be incorporated into stock prices and that there is no causal relationship between trading hours and variance in stock prices.

Stoll and Whaley find that the procedures for opening trading on the New York Stock Exchange appear to affect the volatility of returns. Returns are more volatile around the opening than they are around the close, and the additional volatility is not caused by the arrival of public information. It appears that the volatility is higher because the opening procedures fail to smooth out temporary price deviations arising from trading imbalances.

Schwert analyzes the behavior of volatility in stock prices using daily data from 1885 through 1987. He finds that the October 1987 stock market crash was unusual in many ways: in particular, stock price volatility jumped dramatically during and after the crash but quickly returned to lower, more normal levels. Schwert uses data on implied volatilities from call option prices and estimates of volatility from futures contracts on stock indexes to confirm this result.

Singleton investigates the relative contributions of noise and aggregate economic disturbances to volatility in stock prices. He predicts stock prices using the long- and short-term interest rates, volume, and an unobserved "noise" shock, and tests his findings against daily data for January 1982 through August 1987. Singleton finds that variation in interest rates explains at least 40 percent of the conditional volatility of stock returns over daily intervals. Trading volume does not explain any of the volatility unexplained by interest rates and the noise shock.

Black uses a conventional model with additive separable utility and constant elasticity to explain mean reversion and consumption smoothing. The model uses the price of risk and wealth as state variables but has only one stochastic variable. The price of risk rises temporarily as wealth falls. Black also distinguishes between risk aversion and the consumption elasticity of marginal utility. He can use the model to match estimates of: consumption volatility, wealth volatility, mean reversion, the average growth rate of consumption, the average real interest rate, and the average market risk premium.

The equity premium puzzle identified by Mehra and Prescott states that the difference between the expected rate of return on the stock market and the riskless rate of interest is too large given the small variance in the growth rate of per capita consumption. In his paper, Constantinides proposes that the utility of consumption in each period is a decreasing function of "habit," where habit is an exponentially weighted sum of past consumption. This property of preferences, known as habit formation, drives a wedge between the coefficient of relative risk aversion and the intertemporal elasticity of substitution in consumption. Habit formation resolves the equity premium puzzle and also sheds light on related questions about asset prices and the consumption function.

Barro finds that for the United States—especially for long samples that begin in 1891 or 1921—lagged stock returns explain much of the growth in the rate of investment. Moreover, since 1921 the stock market return dramatically outperforms q (the ratio of the market's valuation of capital to the long-run cost of acquiring new capital). This is true even though the change in the *q* measure approximates the change in real stock prices plus other variables that ought to matter for investment. Barro suggests that an exogenous disturbance (such as an increase in the prospective rate of return on capital) shows up contemporaneously as an increase in stock prices and corporate profits and, with a lag of a year or more, as an expansion of investment expenditures and a further increase in profits. In examining the stock market crashes of 1929 and 1987, Barro finds that investment spending for 1930-2 performed worse than the stock market would have predicted, while spending for 1988 was surprisingly high. For Canada since 1928, a simple relationship between investment and stock returns (and corporate profits) looks similar to that for the United States. However, when the interaction between the two countries is considered, the U.S. stock market has more predictive power than the Canadian market for Canadian investment.

Bernanke reexamines the role of clearing and settlement systems in financial markets, focusing particularly on futures markets. He finds that the praise received by the Federal Reserve for its handling of the crisis situation in October 1987 is warranted. The Fed performed its proper function of "bailing out" the system from the effects of an extraordinary shock. However, Bernanke finds the vulnerability of the financial system to a major price move a puzzle. He suggests that relatively simple changes in futures contracts, for example, would eliminate the risk of system breakdown stemming from sharp price changes. In particular, a "limited liability" provision for futures contracts would reduce clearing and settlement risk.

Harris compares several instruments for holding and trading broad stock market risk: program trading; package trading; private index funds; open- and closed-end mutual index funds; index participations; futures; warehouse receipts; index options; and supershares. He discusses what factors might determine their acceptance and what impact they might have on market liquidity and volatility. He concludes that a securitized open-end index fund with provisions for continuous deposits and redemptions in-kind may be most successful. If accepted, it would increase liquidity and decrease transitory volatility in the cash index market.

Others participating in the conference were: Martin Feldstein, NBER and Harvard University; Andrew W. Lo, NBER and MIT; A. Craig MacKinlay, University of Pennsylvania; Eduardo S. Schwartz, University of California at Los Angeles; and Robert J. Shiller, NBER and Yale University.

Conference Calendar

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 Summer 1989 issue of the *Reporter* is June 1. If you have any questions about procedures for submitting materials for the calendar, please call Kirsten Foss Davis at (617) 868-3900.

May 11-12, 1989
Program Meeting: Labor Studies, NBER

May 12, 1989
Conference on Competition in Deregulated Airlines Markets, NBER

May 19-20, 1989
Conference on Political Economy, NBER

June 10-11, 1989
Far Eastern Meeting, Econometric Society

June 15-17, 1989
Conference on Capital Markets and Debt Management, Center for Economic Policy Research/Italian Macroeconomic Policy Group

June 19-20, 1989
International Seminar on Macroeconomics, NBER

June 21-24, 1989
North American Summer Meeting, Econometric Society

June 26-29, 1989
European Research Workshop on International Trade, Center for Economic Policy Research/Centre for Applied Research, Bergen

July 13-15, 1989
Australasian Meeting, Econometric Society

July 14, 1989
Program Meeting: Economic Fluctuations, NBER

August 1, 1989
Latin American Meeting, Econometric Society

August 14-17, 1989
Joint Statistical Meetings, American Statistical Association*

September 4-8, 1989
European Meeting, Econometric Society

September 13-15, 1989
Conference on Mismatch and Labor Mobility, Center for Economic Policy Research

September 14-15, 1989
Panel Meeting on Economic Activity, Brookings Institution

September 17-20, 1989
Annual Meeting, National Association of Business Economists*

October 4-7, 1989
19th (Biannual) Conference, Center for International Research on Economic Tendency Surveys

October 6-7, 1989
Conference on Economic Growth, NBER

October 8-11, 1989
82nd Annual Conference, National Tax Association-Tax Institute of America*

October 17, 1989
Round Table: Reducing the Risk of Economic Crisis, NBER

October 19-20, 1989
Conference on the United States and Japan in the 1990s, NBER

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

October 26-27, 1989
Program Meeting: Financial Markets and Monetary Economics, NBER

November 3-4, 1989
Conference on Research in Income and Wealth: International Economic Transactions, NBER

November 14, 1989
Conference on Tax Policy and the Economy, NBER

November 16-17, 1989
Program Meeting: Taxation, NBER

November 19-21, 1989
Annual Meeting, Southern Economic Association*

December 8-9, 1989
Universities Research Conference: Labor Studies, NBER

December 14-15, 1989
Micro Brookings Panel on Economic Activity Conference, Brookings Institution

December 15-16, 1989
Program Meeting: International Studies: "International Competitiveness," NBER

March 22-26, 1990
Conference on Financial Crisis, NBER

April 5-8, 1990
Conference on Aging, NBER

April 13-15, 1990
Conference on Economic Growth, NBER

April 19-20, 1990
Program Meeting: Taxation, NBER

May 4-5, 1990
Conference on Research in Income and Wealth: Measurement Issues in the Service Sector, NBER

September 23-26, 1990
Annual Meeting, National Association of Business Economists*

September 22-25, 1991
Annual Meeting, National Association of Business Economists*

September 15-18, 1992
Annual Meeting, National Association of Business Economists*

September 19-23, 1993
Annual Meeting, National Association of Business Economists*

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

Bureau News

NBER Economists to Washington

President George Bush has tapped three more NBER economists to join his administration. NBER Research Associate John B. Taylor has been named to the Council of Economic Advisers (CEA); Faculty Research Fellow Lawrence B. Lindsey has been appointed Associate Director of the Office of Policy Development; and former NBER Research Associate Michael R. Darby has been nominated Undersecretary for Economic Affairs at the U.S. Department of Commerce.

Taylor is a specialist in macroeconomics and monetary policy. He has been a professor at Stanford University since 1984 and previously taught at Princeton and Columbia.

Lindsey has been an assistant professor of economics at Harvard University since 1984. Prior to that appointment, he spent three years on the staff of the CEA in Washington.

Darby has been Assistant Secretary for Economic Policy at the U.S. Department of the Treasury. Previous to that, he was a professor of economics at the University of California, Los Angeles.

Tayylor and Lindsey will be working closely with CEA Chairman Michael J. Boskin who was an NBER Research Associate and Director of the Bureau's Palo Alto office before being appointed to the Council.

Report on Immigration Available

The NBER recently published a Summary Report on "Immigration, Trade, and the Labor Market." This 40-page booklet, edited by Richard B. Freeman, summarizes the results of an NBER project financed by the Ford Foundation and completed last year.

After an introduction and overview by Freeman, George J. Borjas describes recent immigration to the United States. Robert H. Topel discusses the impact of immigration on local labor markets; Lawrence J. Katz looks at how trade affects U.S. labor markets; and John M. Abowd compares the effects of immigration and trade in the United States and Canada.

The Summary Report is free and may be ordered by writing to: "Immigration Report," Publications Department, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138. A more in-depth description of this research will be published by the University of Chicago Press in a volume of the same title. Its availability will be announced in a future issue of the *NBER Reporter*.

Freeman is the director of the NBER's Program in Labor Studies and a professor of economics at Harvard University.

Tax Program Meeting in Cambridge

Members and guests of NBER's Program in Taxation, which is directed by David F. Bradford of Princeton University, met in Cambridge on December 1-2. The agenda was:

Jonathan S. Skinner, NBER and University of Virginia, "Housing Wealth, Taxation, and Saving"
Discussant: James M. Poterba, NBER and MIT

Lawrence H. Goulder, NBER and Harvard University, "Tax Policy, Housing Prices, and Housing Investment" (NBER Working Paper No. 2814)
Discussant: John B. Shoven, NBER and Stanford University

James R. Hines, Jr., NBER and Princeton University, "Multinational Transfer Pricing and Its Tax Consequences: Where the Profits Are"
Discussant: Christophe Chamley, Boston University

Richard J. Zeckhauser, NBER and Harvard University, and Stephen Johnson, Harvard University, "Tax Burden, In-Kind Transfers, and Direct Government Provisions"
Discussant: Richard J. Arnott, Queen's University

Don Fullerton, NBER and University of Virginia, "If Labor Is Inelastic, Are Taxes Still Distorting?" NBER Working Paper No. 2810)
Discussant: Andrew B. Lyon, NBER and University of Maryland

Jane G. Gravelle, NBER and Congressional Research Service, and Laurence J. Kotlikoff, NBER and Boston University, "The Efficiency Gains from the 1986 Tax Reform Act: A New Look"
Discussant: Alan J. Auerbach, NBER and University of Pennsylvania

Anne Dryden Witte, NBER and Wellesley College; Kurt Beron, University of Texas at Dallas; and Helen V. Tauchen, University of North Carolina, Chapel Hill, "A Structural Equation Model for Tax Compliance and Auditing" (NBER Working Paper No. 2556)
Discussant: Joel B. Slemrod, NBER and University of Michigan

Skinner analyzes the potential cost of tax policy—and, in particular, the subsidy to owner-occupied housing—in terms of higher housing prices. During the 1970s, the inflation-adjusted price of a new house rose by more than 20 percent. That type of appreciation benefits current homeowners, but makes future generations worse off, because they must devote a larger fraction of saving to housing than their predecessors did. Furthermore, revenue from taxing capital income may fall as tax-preferred housing wealth crowds out taxable nonresidential wealth. In sum, the impact of tax policy on housing wealth can have important effects on long-run capital accumulation.

Goulder investigates the effects of the Tax Reform Act of 1986 on the performance of housing and other industries. He finds that in the short run, the recent cuts in corporate tax rates, elimination of investment tax credits, and scaling back of depreciation deductions together have negative implications for investment in nonresidential capital but positive effects on housing investment. This mainly reflects the fact that prior to the 1986 tax reforms, investment tax credits and favorable depreciation rules disproportionately benefited nonhousing industries; hence, their removal especially affects industries other than housing and helps "crowd in" housing investment. Over the longer term, however, the tax changes imply lower investment in housing as well as in other types of capital. The reduced housing investment stems from adverse effects of the reforms on aggregate output and real income.

Hines analyzes the regulations that apply to international transfers within multinational firms. Multinational corporations frequently move large volumes of goods and services across borders between their parent companies and foreign affiliates. These transactions, and the prices at which they take place, have important tax consequences for firms and governments, since tax rates often differ dramatically among countries. Firms have incentives to declare profits in low-tax locations while governments often do not know where profits were really earned. Hines finds that current tax rules define income sources in a way that is inconsistent with other aspects of the tax system. A consistent treatment would be very simple to apply in some cases and would allocate income largely according to costs.

Zeckhauser and Johnson examine the use of in-kind transfers to increase the supply of a good, such as housing, and thereby lower its price. Old producers of the good will suffer, while old consumers of the good will benefit. To minimize costs, in-kind transfer programs must use subsidy discrimination: directing government expenditures to new but not to old producers. In practice, investment tax credits or training subsidies for new professionals are two examples of subsidy discrimination. Direct government production is an extreme case of subsidy discrimination and may provide a way to avoid pushing up rents to existing producers. In-kind transfer programs currently are used in the United States and most other nations.

Fullerton compares previous attempts to define and measure "marginal excess burden" of increasing taxes on labor in order to fund a public project. One procedure defines "marginal excess burden" only as the distortionary effects of the tax. The additional wage tax is distorting—that is, makes consumers worse off than a lump-sum tax would—even when actual labor supplied is unchanged. However, the government's decision to fund the public project is made easier by the extra revenue generated by consumers who work more in order to offset their lost income. This "extra-revenue effect" offsets the distortionary effect of the tax. A second measure of "marginal excess burden" includes both the distortionary *and* the revenue effect of the tax, and is zero in the special case in which actual labor supplied is unchanged. This measure leads to the correct decision about whether to fund the public project but leaves the incorrect impression that the wage tax is not "distorting." Even though the wage tax *is* distorting, the spending decision is *not* affected by the tax.

The Tax Reform Act of 1986 greatly altered corporate tax wedges, according to Gravelle and Kotlikoff. Although overall tax rates were relatively unaffected by the act, tax wedges in most industries where substantial noncorporate production occurs resulted in an annual efficiency gain of at least $31 billion.

Witte and her coauthors estimate a model for taxpayers' reported income, tax liability, and the probability of an audit. They find that audits stimulate compliance, but not by much and not for all groups. Audits are more effective at inducing accurate reporting of subtractions from income than of additions to income. IRS activities other than audits also have significant effects on compliance. The authors also find that compliance is higher, if anything, in areas with less-educated and older taxpayers, a large proportion of households headed by females, and a mostly native-born population.

Also attending the meeting were: Jeremy I. Bulow, NBER and Stanford University; Geoffrey Carliner and Daniel R. Feenberg, NBER; Martin Feldstein and Louis Kaplow, NBER and Harvard University; Michael Graetz, Yale University; David G. Hartman, NBER and Data Resources, Inc.; J. Vernon Henderson, NBER and Brown University; Douglas Holtz-Eakin and R. Glenn Hubbard, NBER and Columbia University; Robert P. Inman, NBER and University of Pennsylvania; Jeffrey K. MacKie-Mason, NBER and University of Michigan; Alvin Warren and Bernard Wolfman, Harvard University; Randall D. Weiss, Joint Committee on Taxation; and Mark Wolfson, Harvard University and MIT.

Program in Productivity Holds Meeting

Members and guests of the NBER's Program in Productivity met in Cambridge on December 9 to discuss recent research. The agenda, organized by Program Director Zvi Griliches of Harvard University, was:

Martin N. Baily, NBER and the Brookings Institution, and Robert J. Gordon, NBER and Northwestern University, "Measurement Issues, the Productivity Slowdown, and the Explosion of Computer Power"

Franklin Allen, Gerry Faulhaber, and A. Craig MacKinlay, University of Pennsylvania, "Unbalanced Growth Redux: New Model, New Data"

Barbara Fraumeni, Northeastern University, and Dale W. Jorgenson, Harvard University, "The Accumulation of Human Capital"

Baily and Gordon ask how much of the productivity slowdown since 1973 can be explained by measurement errors. They focus on four case studies and conclude that measurement error cannot explain more than about one-fifth of the total slowdown in nonfarm business private output per hour since 1973.

Allen, Faulhaber, and MacKinlay use 1963–7 data on the capital market to measure productivity growth in the service sector. They argue that an index of capital market performance is a better measure of total productivity growth than conventional measures, which show that services perform relatively more poorly than other sectors do.

Fraumeni and Jorgenson estimate the output of the educational system, which they measure as the incremental effect on human wealth of participation in formal schooling. Human wealth is defined as the sum of lifetime labor incomes for all individuals in the U.S. population. Based on their calculations, the value of human wealth is 14 to 16 times greater than estimates based on the costs of education. They conclude that the lifetime income approach to measuring investment in human capital, when applied to education, yields far greater estimates of the investment in education than those previously available.

Also attending the conference were: Ernst R. Berndt, NBER and MIT; Jeffrey I. Bernstein, NBER and Carleton University; Iain Cockburn and Elizabeth Kremp, Harvard University; Melvyn A. Fuss, NBER and University of Toronto; Wayne B. Gray, NBER and Clark University; Bronwyn H. Hall, NBER and University of California at Berkeley; Fumio Hayashi, NBER and University of Pennsylvania; Charles R. Hulten, NBER and University of Maryland; Adam Jaffe, NBER and Harvard University; Frank R. Lichtenberg, NBER and Columbia University; Robert E. Lipsey, NBER and Queens College; Catherine J. Morrison, NBER and Tufts University; Ariel Pakes, NBER and Yale University; Joshua Rosett and Muriel Thalmann, NBER; Mark Schankerman, NBER and London School of Economics; Donald Siegel, U.S. Bureau of the Census; and Edward N. Wolff, NBER and New York University.

This report was prepared with the assistance of Joshua Rosett.

Economic Fluctuations Program Meeting

About 100 members and guests of the NBER's Program in Economic Fluctuations attended its tenth anniversary research meeting on February 10 in Palo Alto. Program Director Robert E. Hall and Research Associates Thomas J. Sargent and John B. Taylor organized the following program:

S. Rao Aiyagari and Lawrence J. Christiano, Federal Reserve Bank of Minneapolis, and Martin S. Eichenbaum, NBER and Northwestern University, "The Output and Employment Effects of Government Purchases"

Discussant: Lars Peter Hansen, NBER and University of Chicago

Kevin M. Murphy, Andrei Shleifer, and Robert W. Vishny, NBER and University of Chicago, "Increasing Returns, Durables, and Economic Fluctuations"

Russell Cooper, NBER and University of Iowa, and John C. Haltiwanger, University of Maryland, "Macroeconomic Implications of Production Bunching: Factor Demand Linkages"

Steven N. Durlauf, Stanford University, and Robert E. Hall, "Measuring Noise in Stock Prices"

Discussant: Robert J. Shiller, NBER and Yale University

David Card, NBER and Princeton University, "Unexpected Inflation, Real Wages, and Employment Determination in Union Contracts" (NBER Working Paper No. 2768)

Discussant: Robert E. Hall

Nobuhiro Kiyotaki, University of Wisconsin, and Randall Wright, University of Pennsylvania, "Fiat Money in Search Equilibrium"

Discussant: Robert E. Lucas, Jr., NBER and University of Chicago

Robert J. Hodrick, NBER and Northwestern University, Narayana Kocherlakota and Deborah Lucas, Northwestern University, "The Variability of Velocity in Cash-in-Advance Models" (NBER Working Paper No. 2891)

Discussant: John B. Taylor

Prakash Loungani, University of Florida, and Richard Rogerson, Stanford University, "Cyclical Fluctuations and Sectorial Allocation: Evidence from the PSID"

Discussant: David M. Lilien, University of California at Irvine

Aiyagari, Christiano, and Eichenbaum find that persistent increases in government spending have more of an effect on employment and output than temporary increases do. If changes in income do not affect leisure at all, then labor supply depends only on the current real wage and is not a function of the real interest rate. In this special case, the aggregate supply of output does not respond at all to changes in the interest rate, and the effects of temporary and permanent changes in government purchases are both zero. Where changes in income positively affect leisure, the aggregate supply of output increases as the interest rate increases, and permanent changes in government spending have an impact that is at least as strong as the impact of temporary changes.

Murphy, Shleifer, and Vishny consider increasing returns to scale in production as a possible explanation of the procyclical behavior of productivity. With increasing returns to scale, booms are associated with high productivity and high real wages while recessions are associated with low productivity and low real wages. Since consumer goods are durable, demand is highly elastic in the short run, as consumers can easily accelerate or defer purchases over time. The combination of elastic demand and downward-sloping supply makes it inefficient for firms to produce at a constant level. However, efficient output fluctuations are unlikely in an equilibrium in which, because of increasing returns, the coordinated effort of many firms is required to change industry output.

Cooper and Haltiwanger investigate the macroeconomic implications of nonconvexities in production. In the simplest case—a single storable good produced with a nonconvex technology in a Robinson Crusoe economy—the efficient production pattern involves periods of production and periods of idleness. Inventories can be used to help smooth consumption over time, but in general consumption will not be completely smoothed. Thus there will be fluctuations in production and consumption.

Durlauf and Hall present an alternative methodology for understanding the extent of misspecification in expectations-based models. They apply their methodology to the hypothesis that the market value of a stock is the present discounted value of expected future dividends. In particular, they ask whether the variance of model misspecification is large relative to the variance of stock prices. They find that model noise dominates fluctuations in stock prices. Therefore, understanding the noise component of stock prices is critical to an understanding of the stock market.

Card asks how changes in employment are related to changes in real wages. Using a large sample from the unionized sector of Canadian manufacturing, he finds support for nominal contracting models of employment (in which real wage changes trace out movements along a downward-sloping labor demand schedule). He also finds that unexpected price changes occurring within a contract period generate unanticipated real wage changes. These lead to changes in employment that do not fade over time. Card's findings are consistent with a labor market model in which nominal wages are set in anticipation of future demand conditions, and firms are free to set employment in response to price changes.

Kiyotaki and Wright analyze how unbacked currency can function as a medium of exchange. They develop a general equilibrium barter model in which individuals with heterogeneous tastes exchange currency for goods. They show that an equilibrium exists where currency has positive value. In this equilibrium, individual traders who use currency have higher utility than those who barter, in part because they acquire their desired consumption goods more quickly. Finally, the use of fiat money stands up to variations in the model, such as some transactions costs, rate-of-return dominance, and taxation of currency.

Hodrick, Kocherlakota, and Lucas examine a class of rational expectations models that produce demand for money from the explicit solution of an economic agent's constrained maximization problem. They are interested in how predictions of the models about the endogenous stochastic processes for variables such as the velocity of circulation of money, the price level, and the nominal and real interest rates change with changes in the parameters of agents' objective functions. Some of the models work quite poorly, in the sense that their money demand functions are not sensitive to interest rates; in others, the elasticity of money demand with respect to the nominal interest rate is realistic. But even the more realistic models often are inconsistent with data from the U.S. economy regardless of the forcing processes, the preference specifications, or the precision of the agents' information about the future.

Lougani and Rogerson examine whether the observed correlation between the dispersion of sectorial growth rates and unemployment is evidence that intersectorial movements of labor account for much of total unemployment. Using disaggregated data from the Michigan Panel Study of Income Dynamics, they trace the movement of workers over time and are able to measure the amount of unemployment attributable to reallocating labor across sectors. They find that sectorial mobility is important in explaining total unemployment.

David Bizer of Johns Hopkins University assisted in the preparation of this article.

Financial Economists Meet

About 40 members and guests of the NBER's Program in Financial Markets and Monetary Economics met in Cambridge on February 24. The agenda was:

Kenneth R. French, NBER and University of Chicago, and James M. Poterba, NBER and MIT, "Rational and Irrational Explanations for Japanese Share Prices"

Discussant: Andrew Lo, NBER and MIT

Stephen G. Cecchetti, NBER and Ohio State University, Pok-sang Lam, Stanford University, and Nelson C. Mark, Ohio State University, "Mean Reversion in Equilibrium Asset Prices" (NBER Working Paper No. 2762)

Discussant: John Y. Campbell, NBER and Princeton University

Alberto Giovannini, NBER and Columbia University, and Philippe Weil, NBER and Harvard University, "Risk Aversion and Intertemporal Substitution in the Capital Asset Pricing Model" (NBER Working Paper No. 2824)

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

Miles S. Kimball, NBER and University of Michigan, "Precautionary Saving and the Marginal Propensity to Consume"

Discussant: Richard H. Clarida, NBER and Columbia University

Frederic S. Mishkin, NBER and Columbia University, "The Information in the Term Structure About Future Inflation: A Multicountry Empirical Study"

Discussant: V. Vance Roley, NBER and University of Washington

Robert J. Shiller, NBER and Yale University, "Initial Public Offerings: Investor Behavior and Underpricing" (NBER Working Paper No. 2806)

Discussant: Andrei Shleifer, NBER and University of Chicago

French and Poterba investigate the wide disparities in observed price-earnings ratios (P/Es) between the United States and Japan. At the end of 1988, the U.S. P/E was approximately 13, while the Japanese P/E was 54. Even after adjusting for accounting differences, principally differences in depreciation practices and intercorporate equity holdings, Japanese P/Es are roughly double those of U.S. firms. Moreover, the rapid increase in the Japanese P/E during the mid-1980s is difficult to reconcile with traditional "dividend discount" models of stock price valuation. Neither increases in Japanese dividends and earnings during this period, nor the variation in the required returns on equities, seem large enough to explain the rise in Japanese price-earnings ratios.

Cecchetti, Lam, and Mark examine the recent empirical finding that stock returns contain substantial negative serial correlation at long horizons. They argue that this is consistent with a model of an endowment economy with a representative agent where asset price movements depend on the desire of investors to smooth consumption. The authors find that when investors display only a moderate consumption-smoothing motive, their model easily can produce the amount of mean reversion present in historical data on returns.

Giovannini and Weil show that the parameters measuring risk aversion and intertemporal substitution affect consumption and portfolio allocation decisions in symmetrical ways. An elasticity of intertemporal substitution of one leads to myopia in consumption–saving decisions (the future does not affect the optimal consumption plan), while a coefficient of relative risk aversion of one gives rise to myopia in portfolio allocation (the future does not affect optimal portfolio allocation). The empirical evidence is consistent with the behavior of intertemporal maximizers who have a coefficient of relative risk aversion of one and an elasticity of intertemporal substitution different from one.

Knowing the marginal propensity to consume out of wealth is important for evaluating the effects of taxation on consumption, for assessing the possibility of multiple equilibriums because of aggregate demand spillovers, and for explaining observed variations in consumption. Kimball analyzes the effect of uncertainty on the marginal propensity to consume within the context of the permanent-income hypothesis. He finds that given plausible conditions of the utility function, income risk raises the marginal propensity to consume out of wealth. He also characterizes the marginal investment portfolio in response to changes in wealth.

Mishkin asks what the term structure (for maturities of 12 months or less) tells us about future inflation in ten OECD countries. He finds that for the majority of the countries in his sample, the term structure contains little information about the future path of inflation. However, in France the term structure contains a highly significant amount of information about future changes in inflation, while the term structures in both Germany and the United Kingdom provide some significant information, but not as much. For every country studied except the United Kingdom, however, there is a great deal of information in the term structure of *nominal* interest rates about the term structure of *real* interest rates. This suggests that, for most countries, researchers can examine observable data on the nominal term structure to provide them with information about the behavior of the *real* term structure.

Shiller surveyed investors in initial public offerings (IPOs) to learn about patterns of investor behavior that might be relevant to theories of underpricing. Respondents were asked for their perception of the allocation process, their concern with stockbroker or underwriter reputation, their theories of IPO underpricing, and their communications and information sources. His results support some existing theories of IPO underprising and also suggest different hypotheses: the impresario hypothesis, that underwriters deliberately underprice to obtain publicity and promote enthusiasm; an investor risk perception hypothesis; and a fairness-relationship hypothesis.

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Bordo is an NBER research associate and a professor of economics at the University of South Carolina.

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Summers is the Nathaniel Ropes Professor of Political Economy at Harvard University and an NBER research associate.

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The Dynamics of an Aging Population: The Case of Four OECD Countries

Alan J. Auerbach, Robert Hagemann, Laurence J. Kotlikoff, and **Giuseppe Nicoletti**
Working Paper No. 2797
February 1989
JEL No. 320

Demographic changes on the scale of those anticipated in most OECD countries have many economic effects that impinge on a country's fiscal viability. Evaluating the effects of associated changes in capital-labor ratios and in the welfare and behavior of different generations requires a dynamic general equilibrium model. In this paper, we modify the 75 generations-250-year demographic simulation model, presented in Auerbach and Kotlikoff (1987, Chapter 11), to incorporate bequest behavior, technological change, the possibility that the economy is open to international trade, and government consumption expenditures that depend on the age composition of the population. Further, we adapt the model to study the effects of impending demographic changes in Japan, the Federal Republic of Germany, Sweden, and the United States.

The simulation results indicate that these changes will have a major impact on rates of national saving, real wage rates, and current accounts. One of the fundamental lessons of this paper is that allowing for general equilibrium adjustments reduces the adverse welfare effects of increasing dependency ratios. Nevertheless, the welfare costs, and particularly their distributions across cohorts, pose serious challenges for policymakers in some cases.

Why Does Stock Market Volatility Change Over Time?

G. William Schwert
Working Paper No. 2798
December 1988
JEL Nos. 313, 131

This paper analyzes the relationship of stock volatility to real and nominal macroeconomic volatility, financial leverage, stock trading activity, default risk, and firm profitability. I use monthly data from 1857–1986. An important fact, previously noted by Officer (1973), is that stock return variability was unusually high during the 1920–40 Great Depression. Moreover, leverage has a relatively small effect on stock volatility. The amplitude of the fluctuations in aggregate stock volatility is difficult to explain using simple models of stock valuation.

Markups in U.S. and Japanese Manufacturing: A Short-Run Econometric Analysis

Catherine J. Morrison
Working Paper No. 2799
December 1988
JEL Nos. 600, 611

In this paper I construct a production-theory-based model of firms' markup behavior. The theoretical structure, based on variants of generalized Leontief cost and expenditure functions, allows the impacts of both supply and demand shocks on firms' markup behavior to be assessed through elasticities. Adjustment costs on labor and capital, and economies of scale, also are incorporated in the model. Using manufacturing data for the United States and Japan from 1960 through 1981, I find that markups for manufacturing firms have increased over time but tend to be procyclical in the United States and countercyclical in Japan. This difference stems primarily from differential investment behavior. In addition, capacity utilization and returns to scale tend to counteract the short-run profit potential from markup behavior, so that markups measured assuming constant returns may be biased downward. Finally, both supply and demand shocks appear to have a significant systematic impact on markups.

Shirking or Productive Schmoozing: Wages and the Allocation of Time at Work

Daniel S. Hamermesh
Working Paper No. 2800
December 1988
JEL No. 820

Major strands of recent macroeconomic theory hinge on the relationship between workers' efforts and their wages, but there has been no direct general evidence on this relationship. This study uses data from household surveys for 1975 and 1981 that include detailed time diaries to examine how changes in the use of time on the job affect wages. For the average worker, additional time spent relaxing at work has no impact on earnings (and presumably is unproductive). However, additional on-the-job leisure does raise the earnings of workers who take very short breaks. This pattern only differs among union workers for whom additional leisure time (only in unscheduled breaks) appears productive. The results suggest that further growth in on-the-job leisure will reduce productivity (output per hour paid-for), that monitoring workers can yield returns to the firm, but that eliminating breaks entirely is counterproductive.

Fear of Nuclear War and Intercountry Differences in the Rate of Saving

Joel B. Slemrod
Working Paper No. 2801
December 1988
JEL No. 321

This paper demonstrates that a survey-based measure of the perceived likelihood of nuclear war in a country is correlated negatively with the country's rate of net private saving, holding other determinants of saving constant. I use data on 20 OECD countries for 1981-4 and calculate the perceived likelihood of nuclear war from surveys conducted in each country by the Gallup International Research Institutes. The magnitude of the estimated effect is large, suggesting that an increase of 10 percent in the fraction of the population that believes a world war is likely is associated with a decline of 4.1 percentage points in the net private saving rate.

This finding is consistent with other evidence based on U.S. aggregate time series and cross-individual data suggesting that fear of nuclear war decreases savings. That proposition has profound implications for the interpretation of the performance of the post-nuclear world economy.

Adjusting to an Aging Labor Force

Edward P. Lazear
Working Paper No. 2802
December 1988
JEL Nos. 813, 821

Demographic changes in the labor force imply that firms must change their labor policies in the coming decades. My estimates suggest that the labor force will get older and more female. The aging will not be as pronounced for males as for females because the trend toward early retirement among males will offset demographic changes. The labor force will grow until around 2015 and then will decline. Given these changes, there are a number of issues that face employers. First, the aging work force may mean an increase in the size of the firm's current deficit, defined as the difference between sales and labor cost. Second, firms may do well to invest in assets that are highly correlated with the nominal wage bill liability. Such assets include short-term Treasury bills and, paradoxically, pension assets put back into the capital of the firm itself. This strategy can reduce the risk of bankruptcy. Third, explicit buyouts are the easiest way to reduce the size of the elderly work force. However, this will not help the individual firm's deficit problem. Fourth, declining ages of retirement among males can be reversed by changes in Social Security policy. A decline in real benefits and an increase in the age of entitlement are likely to have the largest effects on raising the retirement age.

The Joint Retirement Decision of Husbands and Wives

Michael D. Hurd
Working Paper No. 2803
December 1988
JEL Nos. 821, 918

This paper asks whether husbands and wives tend to retire at the same time, and why. Similar retirement dates could be caused by similar tastes (termed assortative mating), by economic variables, or by the complementarity of leisure. Each explanation would have different implications for the response of retirement to changes in policy.

Both simple data analysis and economic models suggest that husbands and wives tend to retire at the same time. According to the results, very little of that coordination is attributable to economic variables. Simple cross tabulations also rule out assortative mating as an important explanation. This leaves complementarity of leisure. However, because of data limitations, this conclusion is mainly qualitative.

The dataset used in this study is the New Beneficiary Survey.

Demographic Analysis of Birthweight-Specific Neonatal Mortality

Hope Corman, Michael Grossman,
and **Theodore J. Joyce**
Working Paper No. 2804
December 1988
JEL No. 913

This paper explores the determinants of birthweight-specific neonatal mortality rates across states in the United States in 1980. We explore the interactions between the determinants and birthweight through new data available from the National Infant Mortality Surveillance (NIMS). The NIMS links birth and death certificates for each state, producing a database with race-specific neonatal mortality rates by birthweight and other characteristics. Using a reduced-form model, we find that abortion and the availability of neonatal intensive care are the most important determinants of overall neonatal mortality. For whites, the two factors are of approximately equal importance. For blacks, the availability of abortion has twice the impact of neonatal intensive care. Moreover, our results suggest that neonatal mortality rates could be lowered by policies that reduce the inequality in these health resources across states.

Employer Behavior in the Face of Union Organizing Drives

Richard B. Freeman and **Morris M. Kleiner**
Working Paper No. 2805
December 1988

The direct role of employers in union organizing has been a neglected part of the literature on union organizing for some time. This study examines the determinants and consequences of employer behavior in the face of an organizing drive. We find that there is a substitution between high wages/benefits/good working conditions/supervisory practices and "tough" management opposition to unionism. Also, a high innate propensity for a union victory deters management opposition, while some indicators of a low propensity also reduce opposition. "Positive industrial relations" raise the chances that the firm will defeat the union in the election, as does bringing in consultants and having supervisors campaign intensely against the union. The careers of managers whose wages/supervisory practices/benefits lead to union organizing drives, much less to union victories, suffer as a result.

In general, our results are consistent with the notion that firms behave in a profit-maximizing manner in opposing an organizing drive. Also management opposition, reflected in diverse forms of behavior, is a key component in the ongoing decline in private sector unionism in the United States.

Initial Public Offerings: Investor Behavior and Underpricing

Robert J. Shiller
Working Paper No. 2806
December 1988
JEL No. 313

I sent a questionnaire survey to investors in initial public offerings (IPOs) in order to learn about patterns of investor behavior that might be relevant to theories of their underpricing. The survey asked respondents for their perception of the allocation process, their concern with stockholder or underwriter reputation, their theories of IPO underpricing, and their communications and information sources. The results indicate that there is an element of truth in some existing theories of IPO underpricing, and in the impresario hypothesis (that underwriters deliberately underprice to obtain publicity and promote enthusiasm), the investor risk perception hypothesis, and the fairness-relationship hypothesis.

The Excess Smoothness of Consumption: Identification and Interpretation

Marjorie Flavin
Working Paper No. 2807
December 1988
JEL Nos. 131, 132

This paper investigates the implications of the omitted-information problem—that is, the econometric problem that arises because an econometrician cannot include explicitly the complete set of variables potentially used by agents—in the context of the "excess smoothness" phenomenon posed by Deaton (1987). I show that an econometrician who fails to take into account the effects of omitted information will conclude incorrectly that an empirical finding of excess smoothness of consumption implies that the income process is nonstationary. By contrast, with a more thorough understanding of the omitted information problem, the finding of excess smoothness of consumption is explained easily with two assumptions: 1) the consumption data are generated by the excess sensitivity alternative hypothesis, in which consumption is a weighted average of current income and permanent income; and 2) agents forecast on the basis of a larger information set than the econometrician has. Further, excess smoothness is consistent with a wide range of stationary as well as nonstationary income processes. Thus, the common presumption that the excess smoothness phenomenon is linked in an essential way to the stationarity or nonstationarity of the income process evaporates when omitted information is taken into consideration.

A Dynamic Analysis of Household Dissolution and Living Arrangement Transitions by Elderly Americans

Axel Börsch-Supan
Working Paper No. 2808
January 1989
JEL Nos. 918, 932

This paper exploits the new nonresponse files of the Panel Study of Income Dynamics in order to study transitions of living arrangements of elderly Americans. The paper estimates the probability of household dissolution; that is, the probabilities of transitions from living independently to living with adult children or other persons, and the probability of becoming institutionalized.

I find an astounding stability in living arrangements even after incisive life events such as the death of a spouse or the onset of a disability, or in the years immediately preceding death. A particularly large proportion of the elderly live independently until their deaths. Almost two-thirds of all elderly are living independently in the year of their death, while 14.4 percent share housing with relatives or friends at least once, and 3.1 percent experience a stay in an institution.

Old age, being male, and having a low income significantly increase the risk of institutionalization. Elderly people with large families and nonwhite elderly persons are most likely to share housing. All of this might be expected. An important new finding, however, is the time trend of these probabilities. Holding all other factors constant, the risk of institutionalization increased substantially between 1968 and 1984 while the likelihood of being "taken in" by relatives or friends decreased markedly.

Comparative Advantage and Long-Run Growth

Gene M. Grossman and **Elhanan Helpman**
Working Paper No. 2809
January 1989
JEL Nos. 411, 111

We construct a dynamic, two-country model of trade and growth in which endogenous technological progress results from the profit-maximizing behavior of entrepreneurs. We study the role that the external trading environment, and trade and industrial policies, play in the determination of long-run growth rates. We find that cross-country differences in efficiency at R and D versus manufacturing (that is, comparative advantage) bear importantly on the growth effects of economic structure and commercial policies. Our analysis allows for both *natural* and *acquired* comparative advantage, and we discuss the primitive determinants of the latter.

If Labor Is Inelastic, Are Taxes Still Distorting?

Don Fullerton
Working Paper No. 2810
January 1989
JEL No. 323

Three recent papers measure the marginal excess burden of labor taxes in the United States. They obtain very different results although they all use a zero uncompensated labor supply elasticity and assume that the additional revenue is spent on a public good that is separable in utility. The impression is that other parameters must explain the differences in results.

Yet each paper uses a different concept of excess burden. Here, I calculate all three measures in one model and show how conceptual differences explain the results. Only one of these measures isolates the distortionary effects of taxes in a way that depends on the compensated labor supply elasticity. The other two measures incorporate income effects and thus depend on the actual change in labor. This result was obscured because those papers report positive marginal excess burden even with a zero uncompensated labor supply elasticity. This paper shows conditions under which their measure is zero, and it interprets the measures in light of recent literature.

Exchange Rate Variability and Asset Trade

Torsten Persson and **Lars E. O. Svensson**
Working Paper No. 2811
January 1989
JEL Nos. 431, 441

In discussions about different international monetary arrangements, it often is maintained that exchange rate variability has a negative influence on international trade and foreign investment. This paper addresses one specific aspect of this general issue, namely the effect of exchange rate variability on capital flows and international portfolio diversification. More precisely, we examine how different monetary policies—and among those, policies that aim at stabilizing exchange rates—determine the risk characteristics of nominal assets, and how these risk characteristics determine international portfolio composition and trade in assets, when international asset markets are incomplete.

Major Macroeconomic Variables and Leading Indexes: Some Estimates of Their Interrelations, 1886-1982

Victor Zarnowitz and **Phillip Braun**
Working Paper No. 2812
January 1989

We examine the interactions within sets of up to six variables representing output, alternative measures of money and fiscal operations, inflation, interest rate, and indexes of selected leading indicators. We use quarterly series, each taken with four lags, for three periods: 1949–82, 1919–40, and 1886–1914. The series are in stationary form, as indicated by unit root tests. For the early years, the quality of the available data presents some serious problems.

We find that the leading indexes and the short-term interest rate have strong effects on output. The monetary effects are reduced greatly when these variables are included. Most variables depend more on their own lagged values than on any other factors, but this is not true of the rates of change in output and the composite leading indexes. We note and discuss some interesting interperiod differences.

A Behavioral Approach to Compliance: OSHA Enforcement's Impact on Workplace Accidents

Wayne B. Gray and **John T. Scholz**
Working Paper No. 2813
January 1989
JEL Nos. 913, 619

Using data on injuries and OSHA inspections for

6842 manufacturing plants between 1979 and 1985, this study tests for the effects of OSHA enforcement. We use measures of general deterrence (expected inspections at plants like this one) and specific deterrence (actual inspections at this plant). We find that both measures of deterrence affect accidents, with a 10 percent increase in inspections with penalties predicted to reduce accidents by 2 percent. The existence of specific deterrence effects, the importance of lagged effects, the asymmetrical effects of probability and amount of penalty on accidents, and the tendency of injury rates to self-correct over a few years support a behavioral model of the firm's response to enforcement rather than the traditional "expected penalty" model of deterrence.

Tax Policy, Housing Prices, and Housing Investment

Lawrence H. Goulder
Working Paper No. 2814
January 1989
JEL Nos. 323, 932

This paper uses a general equilibrium model to assess the effects of major components of the Tax Reform Act of 1986 on the performance of housing and other industries. The model considers both short-term and long-term effects on housing demands, house values, and investment in housing. The results indicate that in the short run, the recent cuts in corporate tax rates, elimination of investment tax credits, and scaling back of depreciation deductions together have negative implications for investment in nonresidential capital but positive effects on housing investment. This mainly reflects the fact that prior to the 1986 tax reforms, investment tax credits and favorable depreciation rules disproportionately benefited nonhousing industries: thus, their removal especially affects industries other than housing and helps to "crowd in" housing investment. Over the long term, however, the tax changes imply lower investment in housing as well as in other types of capital. The reduced housing investment stems from adverse effects of the reforms on aggregate output and real income.

Should Nations Learn to Live with Inflation?

Stanley Fischer and **Lawrence H. Summers**
Working Paper No. 2815
January 1989

It often is argued that the most important costs of inflation can be mitigated substantially by indexing reforms. Yet governments in moderate inflation countries generally have been very reluctant to promote institutional changes that would reduce the costs of inflation. Capital income continues to be taxed on a nominal basis, indexed bonds are a rarity, typical mortgage contracts keep nominal rather than real payments constant, and interest is not paid on required reserves.

This paper examines the welfare consequences of inflation mitigation measures in the context of dynamic consistency theories of the determination of the inflation rate. Our general conclusion is that recognizing the effects of inflation mitigation measures on the choice of the inflation rate substantially undercuts the welfare case in their favor. It is easy to construct examples in which such measures actually reduce welfare. The case for indexing measures is strongest in settings where governments already have strong anti-inflation reputations, cannot precisely control the inflation rate, and can offset the effects of unanticipated inflation without reducing the costs of anticipated inflation. Conversely, the case for inflation mitigation measures is weakest where governments lack strong reputations, can control the inflation rate, and where indexing makes it easier to live with anticipated inflation.

The Health and Earnings of Rejected Disability Insurance Applicants

John Bound
Working Paper No. 2816
January 1989
JEL Nos. 813, 915

Applicants for Social Security Disability Benefits who fail to pass the medical screening make up a natural "control" group for beneficiaries. Data drawn from the 1972 and 1978 surveys of the disabled done for the Social Security Administration show that fewer than 50 percent of rejected male applicants work. Typical earnings of those who work are less that 50 percent of median earnings for other men their age. These data cast doubt on recent econometric work that suggests that the disincentive effects of disability insurance have been substantial.

On the Divergence in Unionism among Developed Countries

Richard B. Freeman
Working Paper No. 2817
January 1989

This paper explores the evolution of unionism in the 1970s and 1980s, when the world economy after the oil shocks created a "crisis of unionism" throughout the western world. I try to explain why union representation of work forces fell in some countries but not in others, and I contrast different union responses to the challenge of the period. I find that rates of unionization diverged greatly among developed countries. The composition of union members shifted from private sector, blue collar workers to public sector and white collar workers in all countries, producing increased divisions within union movements by category of worker. Changes in the industrial composition of employment, changes in public attitudes toward unionism, and the growth of governmental protection of labor do not explain the divergence in density. Differing rates of inflation contributed to the divergence, with unions doing better in countries with high inflation. In addition, unemployment raised density in settings where unions disperse unemployment benefits. The primary reason for the divergence is differences in the incentives and opportunities that different industrial relations systems provide employers to oppose unions. Unions fared best in neocorporatist settings and worst in settings where decentralized bargaining created a strong profit incentive for managers to oppose unions and where management was relatively free to act on that incentive. Union organizations and modes of operating changed significantly in some countries, with declining or endangered unionism, but not in others. Most strikingly, if 1980s trends continue, the West will be divided between countries with strong trade union movements operating in a neocorporatist system, as in Scandinavia, and countries with "ghetto unionism" will be limited to special segments of the work force, as in the United States.

A Markov Model of Heteroskedasticity, Risk, and Learning in the Stock Market

Charles R. Nelson, Richard Startz, and **Christopher M. Turner**
Working Paper No. 2818
January 1989
JEL No. 313

Risk premiums in the stock market are assumed to move with time-varying risk. We present a model in which the variance of the excess return of a portfolio depends on a state variable generated by a first-order Markov process. We estimate a model in which the realization of the state is known to economic agents but unknown to the econometrician. The parameter estimates imply that the risk premium declines as the variance of returns rises. We then extend the model to allow agents to be uncertain about the state. Agents make their decisions in period t, using a prior distribution of the state based only on past realizations of the excess return through period $t-1$, plus knowledge of the structure of the model. The parameter estimates from this model are consistent with asset pricing theory.

Budget Deficits, Tax Incentives, and Inflation: A Surprising Lesson from the 1983-4 Recovery

Martin Feldstein and **Douglas W. Elmendorf**
Working Paper No. 2819
January 1989
JEL Nos. 320, 310

The first two years of the economic expansion that began in 1983 were unusually strong and were accompanied by better inflation performance than would have been expected on the basis of experience in past recoveries. Our evidence contradicts the popular view that the recovery was the result of a consumer boom financed by reductions in the personal income tax. We also find no support for the proposition that the recovery reflected an increase in the supply of labor induced by the reduction in personal marginal tax rates.

The driving force behind the recovery of nominal demand was the shift to an expansionary monetary policy. The rapid expansion of nominal GNP can be explained by monetary policy without any reference to changes in fiscal and tax policy. But the growth of real GNP was more rapid than would have been expected on the basis of the rise in total nominal spending, and the increase in the price level was correspondingly less. The most likely cause of this favorable division of the nominal GNP increase was the sharp rise in the dollar that occurred at this time.

Although part of the dollar's rise can be attributed to the successful anti-inflationary monetary policy, the dollar also increased because of the rise in real interest rates that resulted from the combination of the increase in anticipated budget deficits and the improved tax incentives for investment in equipment and structure.

Thus, expansionary fiscal policy did contribute to the greater-than-expected rise of real GNP in 1983-4, but it did so through an unusual channel. The fiscal expansion raised output because it caused a favorable supply shock to prices and not because it was a traditional stimulus to demand. The budget deficit and investment incentives were expansionary in the short run because, by causing a rise of the dollar, they reduced inflation and thus permitted a faster growth of real GNP.

Imperfect Annuity Markets, Unintended Bequests, and the Optimal Age Structure of Social Security Benefits

Martin Feldstein
Working Paper No. 2820
January 1989
JEL No. 915

The Social Security program now provides a constant real benefit throughout each retiree's lifetime.

This paper asks whether total welfare would rise if benefits were lower in early retirement years (when most individuals have some saving with which to finance consumption) and higher in later years (when the uncertainty of survival and the absence of actuarially fair private annuities makes the availability of Social Security benefits more important).

The analysis shows that there is a potentially important difference between the structure of benefits that would be preferred by the current population of workers and retirees and the structure of benefits that would maximize the steady-state level of social welfare. This difference reflects the role of unintended bequests.

The provision of higher benefits to older retirees reduces individually optimal savings and therefore the level of unintended bequests. While those bequests may have no value to the retirees, they are clearly of value to the young workers who will receive those bequests. More generally, the system of level benefits raises the steady-state level of the capital stock and of total real income.

This paper provides an explicit analysis of a case in which the current workers want benefits to increase with age while the Social Security system that maximizes steady-state welfare would provide higher benefits to young retirees than to the very old.

On the Possibility of Price-Decreasing Bubbles

Philippe Weil
Working Paper No. 2821
January 1989

It is often argued that a rational bubble, because it is positive, must increase the price of a stock. In general this argument is not valid: as soon as bubbles affect interest rates, the fundamental value of a stock will depend on whether or not a bubble is present. Then the existence of a rational bubble, by raising equilibrium interest rates, might depress the fundamental to such an extent that the sum of the positive bubble and the decreased fundamental falls short of the fundamental, no-bubble price. Under conditions made precise in this paper, there can be price-decreasing bubbles and an asset can be "undervalued."

Money, Time Preference, and External Balance

Philippe Weil
Working Paper No. 2822
January 1989

In monetary economies, international differences in rates of time preference in general do not lead to long-run trade imbalances, in sharp contrast to Buiter's (1981) results on nonmonetary overlapping-generation economies. I document this claim in the context of a simple two-country framework in which new immortal families enter each economy over time, and the two countries differ only in their subjective discount rates. Even if consumers are more "impatient" at home than abroad, trade is balanced in the long run in the presence of a constant supply of valued fiat currencies, and the current account is indeterminate.

Money, Credit, and Business Fluctuations

Joseph E. Stiglitz
Working Paper No. 2823
January 1989
JEL No. 310

This paper provides a critique of standard theories of money, in particular those based on money as a medium of exchange. Money is important because of the relationship between money and credit. The process of judging creditworthiness, in which banks play a central role, involves the collection and processing of information. Like many other economic activities involving information, these processes are not described well by means of standard production functions. Changes in economic circumstances can have marked effects on the relevance of previously accumulated information and, accordingly, on the supply of credit. Changes in the availability of credit may have marked effects on the level of economic activity, while changes in real interest rates seem to play a relatively minor role in economic fluctuations. This alternative view has a number of implications for policy, both at the macroeconomic level (for instance, on the role of monetary policy for stabilization purposes and the choice of targets) and at the microeconomic level.

Risk Aversion and Intertemporal Substitution in the Capital Asset Pricing Model

Alberto Giovannini and **Philippe Weil**
Working Paper No. 2824
January 1989

When tastes are represented by a class of generalized isoelastic preferences that—unlike traditional Von Neumann preferences—do not confuse behavior toward risk with attitudes toward intertemporal substitution, the true *beta* of an asset in general is an average of its consumption and market *betas*. We show that the two parameters measuring risk aversion and intertemporal substitution affect consumption and portfolio allocation decisions in symmetrical ways. A unit elasticity of intertemporal substitution gives rise to myopia in consumption-saving decisions (the future does not affect the optimal consumption plan), while a unit coefficient of relative risk aversion gives rise to myopia in portfolio allocation (the future does not affect optimal portfolio allocation). The empirical evidence is consistent with the behavior of intertemporal maximizers who have a unit coefficient of relative risk aversion and an elasticity of intertemporal substitution different from one.

Money Stock Targeting, Base Drift, and Price Level Predictability: Lessons from the U.K. Experience

Michael D. Bordo, Ehsan U. Choudhri, and **Anna J. Schwartz**
Working Paper No. 2825
January 1989

There is some controversy as to whether money stock targeting without base drift (that is, following a trend-stationary growth path) makes the price level more predictable in the presence of permanent shocks to money demand. Developing a procedure that does not run into the Lucas critique, and applying this procedure to the case of the United Kingdom, we find that the variance of the trend inflation rate in the United Kingdom would have been reduced by more than one-half if the Bank of England had not allowed base drift.

The General Equilibrium Effects of Inflation on Housing Consumption and Investment

James Berkovec and **Don Fullerton**
Working Paper No. 2826
January 1989
JEL No. 323

In a mean-variance portfolio choice model, we calculate preferences for each of 3578 households from the 1983 Survey of Consumer Finances among housing, other consumption, and risk. Each household is constrained to have any owner-occupied housing in its portfolio match its housing services consumed. We model corporate taxes in some detail and use regression coefficients to estimate the adjusted gross income, itemizable deductions, and statutory marginal tax rate of each household.

The results of our general equilibrium simulation indicate that inflation does not necessarily increase total owner housing. Top-bracket households increase their owner housing, while others switch into bonds. The greater number of households in low brackets implies that the homeownership rate can fall even if the amount of owner housing rises.

Pregnancy Resolution as an Indicator of Wantedness and Its Impact on the Initiation of Early Prenatal Care

Theodore J. Joyce and **Michael Grossman**
Working Paper No. 2827
January 1989
JEL No. 841

This study examines the impact of the "wantedness" of a pregnancy on the demand for early prenatal care. Past attempts to address this question have depended on the self-assessments of women as to whether they wanted their pregnancy and the subsequent birth. Our approach can be described as a form of revealed preference in which only those pregnancies that are voluntarily terminated by induced abortion are considered to be unwanted.

Using a cohort of pregnant women in New York City, we estimate a demand function for prenatal care in which we control for the probability of giving birth, knowing that a woman is pregnant. We interpret this control as a measure of wantedness.

The results indicate that if the black and Hispanic women who aborted had instead given birth, they would have delayed the initiation of prenatal care over three-quarters of a month longer on average than the mean number of months of delay that were actually observed for the women who gave birth. By allowing women to terminate an unwanted pregnancy, induced abortion *increases* the average utilization of prenatal care among black and Hispanic women relative to what would have been observed if the women who aborted had instead given birth.

Exchange Rate Hysteresis: The Real Effects of Large versus Small Policy Misalignments

Richard Baldwin and **Richard Lyons**
Working Paper No. 2828
January 1989

Using the sticky-price monetary model of exchange rate determination and the sunk cost model of trade hysteresis, we show that a sufficiently large policy misalignment can induce hysteresis in the trade balance and thereby alter the steady-state real exchange rate. In our model, exchange rate dynamics are path dependent, purchasing power parity need not hold, and money need not be neutral, even in the very long run.

We present only positive analysis but conjecture that the results have strong welfare, policy, and econometric implications. Since hysteresis in our model can entail industrial dislocation and the scrappage of sunk assets, we suggest that these factors may constitute a welfare cost of large policy misalignments that have not been considered formally. On the policy side, one could argue sensibly against the dollar volatility of the 1980s without arguing at the same time for a return to a formal exchange rate regime (because 1980s-size swings may involve welfare costs that 1970s-size swings do not). Last, since the long-run exchange rate is path dependent, standard empirical tests of exchange rate models may be misspecified.

The Equity Premium Puzzle and the Risk-Free Rate Puzzle

Philippe Weil
Working Paper No. 2829
January 1989

This paper studies the implications for general equilibrium asset pricing of a recently introduced class of Kreps-Porteus unexpected utility preferences, which is characterized by a constant intertemporal elasticity of substitution and a constant, but unrelated, coefficient of relative risk aversion.

I show that for plausibly calibrated parameter values, the solution to the "equity premium puzzle" documented by Mehra and Prescott (1985) cannot be found simply by separating risk aversion from intertemporal substitutution. Rather, relaxing the parametric restriction on tastes implicit in the time-addictive expected utility specification and adopting Kreps-Porteus preferences in the direction of "more realism" is likely to add a "risk-free rate puzzle" to Mehra and Prescott's "equity premium puzzle."

Wages, Employer Costs, and Employee Performance in the Firm

Harry J. Holzer
Working Paper No. 2830
January 1989
JEL No. 820

This paper uses data from a survey of firms to estimate the effects of a firm's wage level on several measures of its hiring costs and the characteristics and performance of its employees. These measures include: the previous experience and current tenure of its employees; subjective productivity scores for these employees; job vacancy rates; perceived ease of hiring qualified workers for the firm; and hours spent hiring and training new workers. I distinguish the case of high wages imposed on a firm by unions from the case of the firm choosing its wage level in order to maximize profits. I also provide some rough measures of the extent to which firms offset their high wage costs in each case.

The results show that firm wages generally have positive effects on employee experience and tenure as well as on subjective productivity scores. The firm's wages generally have negative effects on job vacancy rates and positive effects on the perceived ease of hiring qualified workers. Higher wages also reduce training time. While the magnitude of each individual effect may not always be large, or even significant, their combined effects suggest that firms offset a good deal of their higher wage costs through improved productivity and lower hiring and turnover costs among their employees.

Disability Status as an Unobservable: Estimates from a Structural Model

Robert H. Haveman, Fung Mey Huang, and **Barbara L. Wolfe**
Working Paper No. 2831
January 1989

We propose an index of "true disability" by treating disability status as an unobservable phenomenon that is causally related to a number of exogenous individual characteristics and is correlated with a number of observed indicators of health, impairment, and qualifications for employment.

First, we define true disability and distinguish it from related concepts. Then we discuss the importance of an objective and reliable measure of disability for research on the determinants of behavior. Next, we present the specification of our structural model for estimating true disability as a latent variable. Finally, we report the results of our estimation in a simple model of labor force participation and compare the effect of using the constructed index and a self-reported disability measure on understanding the determinants of behavior and choice.

Venture Capital and Capital Gains Taxation

James M. Poterba
Working Paper No. 2832
January 1989
JEL Nos. 323, 521

This paper investigates the links between capital gains taxation and the level of venture capital activity. I examine two explanations of how reducing the personal capital gains tax rate may spur venture capital: the first focuses on the supply of funds to the venture industry, and the second on the supply of entrepreneurs.

The supply of funds is unlikely to be the principal mechanism through which the tax affects venture capital, since less than half of venture investors face individual capital gains tax liability on their realized gains. Moreover, most of the growth in venture funding during the last decade has come from tax-exempt investors. However, individual capital gains taxes may have a significant influence on the demand for venture funds. These taxes have an important impact on the incentives of entrepreneurs and other employees of start-up firms who forgo wage and salary income and accept compensation through corporate stock and options.

The paper concludes by noting that reducing the tax rate on all gains is a relatively blunt device for encouraging venture investment. Venture investments account for less than 1 percent of realized capital gains.

Lifetime Incidence and the Distributional Burden of Excise Taxes

James M. Poterba
Working Paper No. 2833
January 1989
JEL Nos. 320, 323

Lifetime income is less variable than annual household income, since the latter reflects transitory shocks to wages, family status, and employment. This implies that households with low income in one year have some chance of being households with higher income in other years. This also significantly affects the estimated distributional burden of excise taxes.

I show that household expenditures on gasoline, alcohol, and tobacco as a share of total consumption (a proxy for lifetime income) are distributed much more equally than expenditures as a share of annual income. Therefore, from a longer-horizon perspective, excise taxes on these goods are much less regressive than standard analyses suggest.

A Time-Series Analysis of Unemployment and Health: The Case of Birth Outcomes in New York City

Theodore J. Joyce
Working Paper No. 2834
January 1989
JEL No. 913

This paper presents an aggregate time-series analysis of unemployment and infant health that improves on previous work in several ways. First, the data are monthly, as opposed to annual; they pertain to New York City from January 1970 to December 1986. Second, I estimate a structural production function in which the race-specific percentage of low-birthweight births is the health outcome. Because I am able to control for the race-specific percentage of women who begin care in the first trimester, as well as for the percentage of births to unmarried mothers, I can use the unemployment rate as a proxy for maternal stress in the production function as one of a set of well-defined health inputs. Third, because a pregnancy is limited to ten months at most, I can specify a lag length with confidence. Fourth, I test the data for stationarity and estimate the production function in levels as well as in deviations from trend. I find no cyclical variation in the percentage of low-birthweight births. The results are insensitive to changes in lag length, the omission of relevant inputs, and the functional form of the coefficients on the distributed lag.

Exchange Rate Dynamics under Stochastic Regime Shifts: A Unified Approach

Kenneth A. Froot and **Maurice Obstfeld**
Working Paper No. 2835
February 1989
JEL No. 431

We use techniques of regulated Brownian motion to analyze the behavior of the exchange rate when official policy reaction functions are subject to future stochastic changes. We examine exchange rate dynamics in alternative cases in which the authorities promise to confine a floating rate within a predetermined range and to peg the currency once it reaches a predetermined future level. We stress similarities between these and several related examples of regime switching.

How Incentive-Incompatible Deposit Insurance Funds Fail

Edward J. Kane
Working Paper No. 2836
February 1989

An incentive-incompatible deposit insurance fund (IIDIF) is a scheme for guaranteeing deposits at client institutions that deploys defective systems of information collection, client monitoring, and risk management. These defective systems encourage voluntary risk-taking by clients, and by managers and politicians responsible for administering the fund.

This paper focuses on how principal-agent conflicts and asymmetries in the distribution of information lead to myopic behavior by IIDIF managers and by politicians who appoint and constrain them. Drawing on data developed in legislative hearings and investigations and in depositions, the paper documents that managers of IIDIFs in Ohio and Maryland knew well in advance of their funds' 1985 failures that important clients were both economically insolvent and engaging in inappropriate forms of risk-taking. It also establishes that staff proposals for publicizing and bringing these clients' risk-taking under administrative control were rejected repeatedly.

The analysis has a forward-looking purpose. Congress and federal regulators have managed the massively undercapitalized Federal Savings and Loan Insurance Corporation (FSLIC) in much the same way that Ohio and Maryland officials did. Unless and until incentives supporting political, bureaucratic, and private risk-taking are reformed, the possibility of an FSLIC meltdown cannot be dismissed. To encourage timely intervention into insolvencies developing in a deposit insurance fund's client base, the most meaningful reforms would force the development and release of estimates of the market value of the insurance enterprise and require fund managers to use the threat of takeover to force decapitalized clients to recapitalize well before they approach insolvency.

Tax Policies for the 1990s: Personal Saving, Business Investment, and Corporate Debt

Martin Feldstein
Working Paper No. 2837
February 1989
JEL No. 323

Although the tax reforms of the 1980s lowered the excess burden caused by high marginal tax rates substantially, they also created significant adverse effects on incentives to save and to invest in business plant and equipment. Effective tax rates on real capital gains and real net interest income remain very high because the tax rules do not recognize the difference between real and nominal magnitudes. These high effective tax rates discourage personal saving. This paper discusses a number of ways in which the tax law could be modified to encourage more saving and less borrowing.

Existing tax rules bias corporate decisions in favor of debt finance relative to equity finance and in favor of investments in intangible assets (such as advertising, consumer goodwill, and R and D) relative to investments in plant and equipment. This paper discusses the use of a cash flow corporate tax (with complete expensing of investment and no deduction for interest payments) as a way of remedying both of these biases in our current tax law.

The Case Against Trying to Stabilize the Dollar

Martin Feldstein
Working Paper No. 2838
February 1989
JEL No. 430

Better domestic economic policies in the 15 years since the collapse of the Bretton Woods system would have prevented the extreme fluctuations of the dollar's exchange value during those years. The pursuit of policies here and abroad that are appropriate for domestic growth in the future should reduce the likelihood of such substantial exchange rate swings in the years ahead. But elevating exchange rate stability to a separate goal of economic policy could have serious adverse consequences. Trying to achieve that goal would mean diverting monetary and fiscal policies from their customary roles and thereby risking excessive inflation and unemployment and inadequate capital formation. Succeeding in the efforts to achieve dollar stability would mean harmful distortions in the balance of trade and in the international flow of capital.

Auctioning U.S. Import Quotas, Foreign Response, and Alternative Policies

Robert C. Feenstra
Working Paper No. 2839
February 1989

In this paper I quantify the potential revenue available to the United States from auctioning import quotas, and the resulting drop in foreign producer surplus relative to free trade. Previous estimates of auction revenue are in the range of \$3.7–5.15 billion for 1986 or 1987. Using simulation results from computable partial or general equilibrium models, I find that this revenue gain would be at the expense of a large drop in foreign producer surplus. Ignoring textiles and apparel, the potential auction revenue is \$1.3–2.15 billion, and the foreign loss is \$0.5–0.7 billion relative to free trade.

One alternative to auction quotas is a system of tariff rate quotas, which are designed to keep supplier countries' welfare equal to welfare in free trade. I calculate that the tariff rate quotas could raise \$0.67–1.55 billion in revenue for the United States. While this amount is less than available through auction quotas, it could still fund a significant program of worker adjustment and would mitigate the foreign response.

The Case of the Vanishing Revenues: Auction Quotas with Monopoly

Kala Krishna
Working Paper No. 2840
February 1989
JEL No. 422

This paper examines the effects of auctioning quota licenses when monopoly power exists. With a foreign monopoly and domestic competition, the sales of licenses *never* will raise any revenue if domestic and foreign markets are segmented. More surprisingly, the inability to raise revenue persists even when partial or perfect arbitrage across markets is possible as long as the quota is not too far from the free trade import level.

In contrast, when there is a home monopoly and foreign competition, the price of a quota license can be positive, so that selling licenses can dominate giving them away. However, because of the absence of any profit-shifting, welfare falls even when licenses indeed raise revenue.

From Deficit Delusion to the Fiscal Balance Rule: Looking for an Economically Meaningful Way to Assess Fiscal Policy

Laurence J. Kotlikoff
Working Paper No. 2841
February 1989

Notwithstanding its widespread use as a measure of fiscal policy, the government deficit is not a well-defined concept from the perspective of neoclassical macroeconomics. From the neoclassical perspective, the deficit is an arbitrary accounting construct whose value depends on how the government chooses to label its receipts and payments. This paper demonstrates the arbitrary nature of government deficits. The argument that the deficit is not well defined is framed first in a simple certainty model with nondistortionary policies, and then in settings with uncertain policy, distortionary policy, and liquidity constraints. As an alternative to economically arbitrary deficits, the paper indicates that the "Fiscal Balance Rule" is one norm for measuring whether current policy will place a larger or smaller burden on future generations than it does on current generations. The Fiscal Balance Rule is based on the economy's intertemporal budget constraint and appears to underlie actual attempts to run tight fiscal policy. It says "take in net present value from each new young generation an amount equal to the flow of government consumption less interest on the difference between the value of the economy's capital stock and the present value difference between the future consumption and future labor earnings of existing older generations." While the rule is a mouthful, one can use existing data to check whether it is being obeyed and, therefore, whether future generations are likely to be trained better or worse than current generations.

Housing Wealth and Aggregate Saving

Jonathan S. Skinner
Working Paper No. 2842
February 1989
JEL Nos. 320, 930

The recent appreciation in housing value can have large effects on aggregate saving. This paper uses a simulation model to show that aggregate saving will decline substantially if life-cycle homeowners spend down their housing windfalls. However, homeowners with a bequest motive may save *more* to assist their children in buying housing that is more expensive now.

To test whether families spend their housing capital gains, I use housing, income, and consumption data from the Panel Study of Income Dynamics. While a cross-section, time-series regression implies that housing wealth does affect saving, a fixed-effects model finds no effect.

Predicting Nursing Home Utilization among the High-Risk Elderly

Alan M. Garber and **Thomas E. MaCurdy**
Working Paper No. 2843
February 1989
JEL Nos. 918, 913

This paper explores the influence of various characteristics on nursing home utilization. It examines a targeted population of elderly individuals whose poor health and lack of social supports were expected to lead to heavy use of long-term care. We develop an empirical framework based on a transition probability model to describe the frequency and duration of nursing home admissions. Using longitudinal data on the high-risk elderly enrollees of the National Long-Term Care Demonstration ("channeling" demonstration), we find that a small set of characteristics distinguish individuals who are likely to be heavy users of nursing homes from low users. The factors associated with a high likelihood of institutionalization are not identical to the health characteristics associated with high mortality; for example, the likelihood of death increases with age, but nursing home utilization does not, when functional status and other characteristics are held constant. A somewhat healthier population might have used nursing homes more heavily than the channeling participants, whose nursing home utilization was limited by high mortality.

Adequacy of International Transactions and Position Data for Policy Coordination

Lois Stekler
Working Paper No. 2844
February 1989
JEL Nos. 220, 430

This paper examines the adequacy of data on current accounts and international indebtedness as measures of the need for policy adjustments and coordination. The growth of the global current account discrepancy and the statistical discrepancy in the U.S. international transactions accounts have raised doubts about the adequacy of these data. This paper includes a brief review of the conclusions of the International Monetary Fund working party on the world current account discrepancy and a detailed examination of the data on U.S. international transactions and net investment position. Both investigations support the conclusion that large shifts in reported data on current accounts and investment positions are likely to reflect real changes.

However, even if data were completely accurate, a given current account or investment position may not indicate the magnitude of necessary policy changes clearly because of lags in the adjustment process or underlying trends. This point is illustrated by the tendency of U.S. net investment income to grow as a result of the continued expansion of both claims and liabilities combined with a higher average rate of return on claims. This underlying tendency is likely to counteract, in part, the negative impact of growing U.S. net indebtedness to foreigners on future net investment income.

Sources of IRA Saving

Daniel R. Feenberg and **Jonathan S. Skinner**
Working Paper No. 2845
February 1989
JEL No. 323

To address the question of whether Individual Retirement Accounts (IRAs) contribute to capital formation, we use the IRS/University of Michigan taxpayer sample for income tax returns during 1980-4. By matching families across a five-year period, we can estimate the dynamic interactions of IRA purchases and other types of saving, correct for individual differences, and test whether IRA purchases are offset in part by other (net) asset sales. The "reshuffling" hypothesis implies that taxpayers who enroll in IRAs should experience, over time, a drop in net taxable interest and dividend income as their taxable assets (or new loans) are used to purchase IRAs. Conversely, the "new saving" view of IRAs implies that taxable interest and dividend income should be unaffected by IRA purchases. We find little or no evidence for the view that IRAs are funded by cashing out existing taxable assets. In fact, individuals who purchased IRAs in each year from 1982-4 *increased* their asset holdings by more than those who did not purchase IRAs. In one sense, our results strongly confirm the studies by Venti and Wise, and Hubbard, that IRA saving represents new saving. Shuffling could still occur, albeit on a secondary level: families who are accumulating both taxable assets and IRAs might have accumulated even more taxable assets if IRAs had not been available.

Comovements in Stock Prices and Comovements in Dividends

Robert J. Shiller
Working Paper No. 2846
February 1989
JEL No. 313

Simple efficient markets models imply that the covariance between prices of speculative assets cannot exceed the covariance between their respective fundamentals unless there is positive information pooling. Positive information pooling occurs when there is more information, in a sense defined here, about the aggregate of the fundamentals than there is about the individual fundamentals.

With constant discount rates, the covariance between prices (detrended by dividing a moving average of lagged dividends) in the United Kingdom and the United States exceeds the covariance of the measure of fundamentals, and there is no evidence of positive information pooling. Regression tests of forecast errors in one country on a real price variable in another country show significantly negative coefficients. When the present value formula uses short rates to discount, there is less evidence of excess comovement.

Integration of Mortgage and Capital Markets and the Accumulation of Residential Capital

Patric H. Hendershott and **Robert VanOrder**
Working Paper No. 2847
February 1989
JEL No. 313

The securitization of fixed-rate mortgages suggests that the FHA/VA market was fully integrated with capital markets by the early 1980s and that the conventional market moved toward integration during the 1980s. Assuming full integration of FHA/VAs via the GNMA securitization process, we first estimate equations explaining near-par GNMA prices weekly for 1981-8. We then set the price equal to the new-issue price and, based upon the preferred equation, compute the perfect-market retail coupon rate. Next we estimate equations (for three-year segments of 1971-88) explaining conventional commitment mortgage coupon rates in terms of current and lagged values of this perfect-market coupon rate. Finally, we examine differences between the perfect-market and actual coupon rates and compute the impact of these differences on residential capital accumulation.

Precautionary Saving in the Small and in the Large

Miles S. Kimball
Working Paper No. 2848
February 1989
JEL Nos. 026, 313

This paper shows the theory of precautionary saving to be isomorphic to the Arrow-Pratt theory of risk aversion. Thus, a large body of knowledge about risk aversion may be applied to precautionary saving, and more generally, to the theory of optimal choice under risk. In particular, I use a measure of the strength of the precautionary saving motive, analogous to the Arrow-Pratt measure of risk aversion, to establish a number of new propositions about precautionary saving and to newly interpret the Dreze-Modigliani substitution effect.

A Modest Proposal for International Nominal Targeting (INT)

Jeffrey A. Frankel
Working Paper No. 2849
February 1989
JEL No. 432

This paper reviews the obstacles to successful international macroeconomic policy coordination. I then offer a proposal for coordination that is designed to have the best chance of overcoming these obstacles: an international version of nominal GNP targeting.

There are three sorts of obstacles to coordination: uncertainty, enforcement, and inflation-fighting credibility. Enforcement is always a problem for coordination, but the problem is particularly great in the presence of uncertainty. In part this is because it is difficult to verify compliance if the "performance criteria" are not directly enough under the control of the authorities. Also, a country may end up regretting ex post the criterion that it agreed to ex ante if the criterion is not related directly enough to the target variables about which it ultimately cares. For example, a country that commits to a narrow range for the money supply may regret that commitment if a shift in velocity occurs.

The time inconsistency of fighting inflation may be a third reason why policymakers would be better off renouncing period-by-period coordination of discretionary policymaking. The way to establish inflation-fighting credibility is to precommit to some nominal anchor. This paper argues that International Nominal Targeting (INT) is the best choice for nominal anchor, and the best choice for the performance criterion for monitoring compliance with international agreements. Nominal GNP (or, better yet, nominal demand) is superior to other candidates, such as M1, for the nominal variable on which policymakers should focus because it is far more robust to velocity shifts and other uncertainties.

Sovereign Debt Repurchases: No Cure for Overhang

Jeremy I. Bulow and **Kenneth Rogoff**
Working Paper No. 2850
February 1989
JEL No. 443

Using a reasonably general model, we show that if a highly indebted country has good investment projects available to it, then it will not benefit from using any of its resources to buy back debt at market prices. Debt buybacks and debt-equity swaps make sense for the country only if these programs are heavily subsidized by creditors. This result holds for all buyback programs, large and small, so long as they involve voluntary creditor participation and are not part of a larger deal including offsetting concessions from lenders. Therefore, our analysis casts doubt on the popular argument that unilateral debt repurchases benefit highly indebted countries by relieving "debt overhang."

Medicaid and the Cost of Improving Access to Nursing Home Care

Paul J. Gertler
Working Paper No. 2851
February 1989
JEL No. 913

This paper shows that the Medicaid program can improve the access of financially indigent patients to nursing home care by raising the rate of return paid on Medicaid patients' care, but only at the cost of lower-quality care. To quantify the policy trade-off, I derive expressions for the elasticity of access with respect to total Medicaid expenditures and the elasticity of access with respect to quality. These expressions of elasticities are complicated by the fact that Medicaid payment formulas are cost-based and therefore depend on the quality choices of nursing homes. Using New York State data, I find that a 10 percent increase in Medicaid expenditures induces a 4.1 percent increase in Medicaid patient care but also reduces nursing home expenditures on patient services by about 3.4 percent.

Money, Income, and Prices after the 1980s

Benjamin M. Friedman and **Kenneth N. Kuttner**
Working Paper No. 2852
February 1989
JEL Nos. 310, 311

Three empirical findings in this paper show that, based on the most recent U.S. experience, there does not exist the kind of close or reliable relationship between money and nonfinancial economic activity that might warrant basing the design and implementation of monetary policy on money in a formally systematic way.

First, extending the familiar time-series analysis to include data from the 1980s sharply weakens the evidence from prior periods, showing that such relationships existed between money and nominal income, or between money and either real income or prices considered separately. Focusing on data from 1970 onward destroys this evidence altogether.

Second, Stock and Watson's finding that particular forms of time-series experiments still showed a significant role for money in affecting real output through 1985 not only becomes weaker when data from 1986 and 1987 are included but also, even for data only through 1985, turns out to depend on the use of a particular short-term interest rate: the Treasury bill rate. Using instead the commercial paper rate, which apparently is superior in capturing the information in financial prices that matters for real output, also greatly weakens their result. Simultaneously using the commercial paper rate and including data through 1987 destroys it altogether.

Third, extending the analysis through 1987 also destroys the time-series evidence from earlier periods, showing that money and income are cointegrated. Even if monetary policy were to be conducted in terms of targets for money growth, the failure of money and income to be cointegrated means that there is no empirical ground for resisting the "base drift" that results from persistent random differences between actual money growth and the corresponding target.

Second Mortgages and Household Saving

Joyce M. Manchester and **James M. Poterba**
Working Paper No. 2853
February 1989

Second mortgages accounted for 10.8 percent of the stock of outstanding mortgage debt at the end of 1987, up from 3.6 percent at the beginning of the 1980s. This paper investigates the determinants of second mortgage borrowing and the characteristics of second mortgage borrowers.

We first calculate the outstanding stock of home equity that remains to be borrowed against on tax-preferred terms, recognizing the limits on interest deductions in the 1986 Tax Reform Act and the 1987 Omnibus Budget Reconciliation Act. Despite these limits, we estimate that more than $2 million of housing equity remains to be borrowed against by current homeowners.

We then present cross-sectional evidence suggesting that households that obtain second mortgages after purchasing a home are less wealthy than other households with similar characteristics. Each dollar of second mortgage borrowing is associated with a 75-cent reduction in household net worth. While these results cannot be given a causal interpretation, they are consistent with the view that increased access to second mortgages has reduced personal saving.

Determining the Impact of Federal Antidiscrimination Policy on the Economic Status of Blacks: A Study of South Carolina

James J. Heckman and **Brook S. Payner**
Working Paper No. 2854
February 1989

This paper assesses the contribution of federal antidiscrimination policy to the dramatic improvement in black economic status in manufacturing that occurred in South Carolina in the mid-1960s. Using a unique data source on wages and employment by race and sex in South Carolina, we evaluate competing explanations. Human capital, supply shift, and a tight labor market do not account for the black breakthrough. Our study shows that federal antidiscrimination programs made a significant contribution.

A Cross-Country Study of Growth, Saving, and Government

Robert J. Barro
Working Paper No. 2855
February 1989
JEL Nos. 110, 023

Models of endogenous economic growth can generate long-term growth without relying on exogenous changes in technology or population. One general feature of these models is the presence of constant or increasing returns in the factors that can be accumulated. I use models of this type to study the determination of per capita growth, investment in physical and human capital, and population growth. The determinants of these variables involve aspects of government policy—including public infrastructure services, maintenance of property rights, government consumption, and taxation—and the initial level of per capita income.

I examine the predicted relationships by using a cross-country sample that expands on the Summers–Heston set of about 120 countries. Aside from their data on levels of per capita GDP and the breakdown of GDP into components, I have added information about the composition of government expenditures, proxies for economic freedom and property rights, measures of political stability, and so on. This expansion in variables reduced the number of countries to 72.

The findings verify some of the predictions about the determination of growth and investment/saving rates. For example, government consumption and investment spending, and proxies for economic freedom, show up as suggested by the models. Also, the interplay among population growth, investment in human capital (school enrollment), and the initial level of per capita income confirm theoretical predictions about the trade-off between the quantity and quality of children.

Quantifying International Capital Mobility in the 1980s

Jeffrey A. Frankel
Working Paper No. 2856
February 1989
JEL Nos. 430, 441

The Feldstein–Horioka finding, that national saving and investment have been highly correlated in the past, was not caused by econometric problems, such as endogenous fiscal policy. It held up equally well when instrumental variables were used. But the inflow of capital to the United States has been so large in recent years that an updating of the sample period to 1987 produces a coefficient on national saving that is lower than in past studies. This decline in the degree of crowding out of investment can be attributed to the increased degree of financial market integration in the 1980s. Capital controls and other barriers to the movement of capital across national borders remained for such countries as the United Kingdom and Japan as recently as 1979, and for France and Italy as recently as 1986. However, a new dataset of forward exchange rates for 25 countries shows that a continuing worldwide trend of integration of financial markets in the 1980s had all but eliminated short-term interest differentials for major industrialized countries by 1988.

It is only the *country premium* that has been eliminated, though. This means that only *covered* interest differentials are small. Nominal and real exchange rate variability remain, and indeed were larger in the 1980s than in the 1970s. The result is that a *currency premium* remains, consisting of an exchange risk premium plus expected real currency depreciation. I test and reject the popular null hypothesis: that expected real depreciation is constant at zero, with a 119-year sample. (Post-1973 datasets do not allow enough observations to provide a useful test of this null hypothesis.) The existence of expected real depreciation means that, even if interest rates are equalized internationally when expressed in a common currency, large differentials in *real* interest rates remain. Investors have no incentive to arbitrage away such differentials. Because there is no force tying the domestic real interest rate to the world real interest rate, it follows that there is no reason to expect any country's shortfalls of national saving to be completely financed by borrowing from abroad.

Trends in Worker Demand for Union Representation

Henry S. Farber
Working Paper No. 2857
February 1989
JEL No. 830

I investigate the dramatic decline in the demand for union representation among nonunion workers over the last decade using data from four surveys conducted in 1977, 1980, 1982, and 1984. Relatively little of the decline can be explained by shifts in labor force structure. However, virtually all of the decline is correlated with an increase in the satisfaction of nonunion workers with their jobs and a decline in nonunion workers' beliefs that unions are able to improve wages and working conditions.

Employment, Unemployment, and Demand Shifts in Local Labor Markets

Harry J. Holzer
Working Paper No. 2858
February 1989

This paper analyzes the effects of demand shifts within and between local labor markets on unemployment and employment levels and on the changes observed in those markets. I measure between-market demand shifts by the means of sales growth for firms in each market; within-market shifts are measured by the variances in each. The variances also are decomposed into between-industry and within-industry components. I also present some firm-level evidence on job applicants, training, and wage and employment adjustments in growing and declining firms.

The results show that demand shifts between markets account for large fractions of the observed variation in unemployment and employment rate levels and changes across markets. Within-area shifts cause much smaller and insignificant amounts of unemployment if they are between-industry, while shifts within areas and industries (accounting for the vast majority of demand shifts across firms) have no clear effects. Therefore, the results suggest that the unemployment effects of demand shifts depend on adjustment costs, which appear to be greatest for shifts between markets. Nonlinearities in estimated effects and growing dispersion of unemployment rates across areas also suggest that demand shifts may have raised aggregate unemployment in the United States in recent years.

But They Don't Want to Reduce Housing Equity

Steven F. Venti and **David A. Wise**
Working Paper No. 2859
February 1989
JEL No. 932

The majority of the wealth of most elderly is in the form of housing equity. It is often claimed that many elderly would transfer wealth from housing to finance current consumption expenditure if it were not for the large transaction costs associated with changes in housing equity. This is the rationale for a market in reverse annuity mortgages.

This paper considers whether transaction costs—understood to include the psychic costs associated with leaving friends, family surroundings, and the like—prevent the elderly from making choices that would improve their financial circumstances. The analysis jointly considers the probability that an elderly family will move and the housing equity that is chosen when a move occurs. The results are based on the decisions of the Retirement History Survey sample between 1969 and 1979.

Relative to the potential gains from a reallocation of wealth between housing equity and other assets, transaction costs are very large. Nonetheless, the effect on the housing equity of the elderly is very small. On balance, if all elderly moved and chose optimum levels of housing equity, the amount of housing equity would be increased slightly. Most elderly are not liquidity constrained. Contrary to standard formulations of the life-cycle hypothesis, the typical elderly family has no desire to reduce housing equity. The desired reduction of housing equity is largest among families with low income and high housing wealth, but even in this case the desired reductions are rather small. These desired reductions are more than offset by the desired increases of other families, especially those with high income and low housing wealth. Thus, consistent with the previous findings of Venti and Wise, and of Feldstein and McFadden, limited demand may explain the absence of a market for reverse annuity mortgages.

The Impact of Government on the Economic Status of Black Americans

James J. Heckman
Working Paper No. 2860
February 1989

This paper reviews recent evidence on black economic progress. It notes that while relative status increased over 1965–81, absolute differentials in real earnings between blacks and whites widened over this period. The paper goes on to summarize recent studies of the impact of government on the economic status of black Americans. I find that educational policy has a strong effect. The evidence on affirmative action programs is mixed: there is an intrinsic bias in the methods used to find no effect of affirmative action programs. Selection bias effects do not account for more than 10–12 percent of measured wage growth of black males.

Choosing among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs: The Case of Manpower Training

James J, Heckman and **V. Joseph Hotz**
Working Paper No. 2861
February 1989
JEL No. 811

The recent literature on evaluating manpower training programs demonstrates that alternative nonexperimental estimators of the same program produce an array of estimates of the program's impact. These findings have led to the call for experiments to be used to perform credible program evaluations. Missing in all of the recent pessimistic analyses of nonexperimental methods is any systematic discussion of how to choose among competing estimators.

This paper explores the value of simple specification tests in selecting an appropriate nonexperimental estimator. A reanalysis of the National Supported Work Demonstration Data, previously analyzed by proponents of social experiments, reveals that a simple testing procedure eliminates the range of nonexperimental estimators that are at variance with the experimental estimates of program impact.

Unemployment, Inflation, and Wages in the American Depression: Are There Lessons for Europe?

Ben S. Bernanke and **Martin A. Parkinson**
Working Paper No. 2862
February 1989
JEL Nos. 130, 042

In this paper, we consider whether there are lessons to be drawn from the experience of the American economy during the 1930s for the current European situation. The comparison reveals some important differences: in particular, the persistence of American unemployment in the 1930s reflected to a much greater degree a sequence of large destabilizing shocks, and much less a low-level equilibrium trap, than does modern European unemployment. The self-correcting tendencies of the 1930s U.S. economy probably were much stronger than is generally acknowledged.

However, the experience of the Depression era confirms the modern observation that the level of unemployment does not much affect the rate of inflation—an observation that, we argue, is consistent with macroeconomic theory. The Depression experience also supports the impression that political factors are important in real wage determination.

Integration of the International Capital Markets: The Size of Government and Tax Coordination

Assaf Razin and **Efraim Sadka**
Working Paper No. 2863
February 1989
JEL Nos. 430, 320

International capital market integration has become a key policy issue in the prospective integration of Europe in 1992. This paper provides a theoretical analysis of the effects of relaxing restrictions on the international flow of capital on the fiscal branch of government: the optimal provision of public goods, the structure of taxation, and income redistribution policies. Concerning issues of interdependent economies, the paper analyzes the scope of tax coordination.

The major findings are: 1) with no administrative barriers to capital flows, the optimal policy is to tax income from investment abroad and from investments at home at the same time; 2) the cost of public funds falls and the supply of public goods rises if restrictions on international capital flows are relaxed; 3) the amount of income redistribution increases with the international capital market liberalization; 4) some minimal degree of tax coordination (such as origin-based or source-based tax schemes) is essential for the existence of an equilibrium in an integrated world economy.

Adverse Selection in Credit Markets and Infant Industry Protection

Harry Flam and **Robert W. Staiger**
Working Paper No. 2864
February 1989
JEL Nos. 411, 422

This paper considers the role for infant industry protection when credit markets suffer from adverse risk selection. We show that asymmetric information about firm-specific risk leads to underfunding of the infant industry in a competitive credit market. A small amount of infant industry protection is welfare-improving, and we derive the optimal infant industry tariff. Finally, we consider an alternative government policy of production subsidies under the assumption that the government shares private knowledge with infant industry firms. We argue that a tariff may dominate production subsidies as an entry-promoting device in this context.

Facts and Factors in the Recent Evolution of Business Cycles in the United States

Victor Zarnowitz
Working Paper No. 2865
February 1989
JEL No. 130

A reexamination of the data indicates a great diversity of cyclical experience in both the distant past and in recent history, but also a distinct moderation of the business cycle in the postwar era (shorter and milder contractions). This is consistent with long and widely held views, but contrary to some recent claims.

This paper presents a list of possible sources of the moderation and examines several hypotheses. There is evidence that some structural shifts (in employment, not in the consumption-investment mix) had a net stabilizing influence. Institutional changes helped mainly by improving the functioning of the financial system. Automatic fiscal stabilizers played an important role. It is difficult to grade the record of macroeconomic policies because it is very mixed, and the active and passive elements on policy are both important and intermingled. Historical assessments and statistical tests suggest that this is true for both fiscal and monetary actions, which were often mistimed, misestimated, or mismatched. Still, some net stabilization was probably achieved. Also, the moderation of the business cycle itself induced some positive changes in expectations and behavior of private economic agents.

Most of these factors worked better in the first than in the second half of the postwar period, when cyclical instability increased along with rises in the levels and variability of inflation and interest rates.

Devaluation Crises and the Macroeconomic Consequences of Postponed Adjustment in Developing Countries

Sebastian Edwards and **Peter Monteil**
Working Paper No. 2866
February 1989

This paper develops our analytical model to explore the relationship between the dynamics of macroeconomic adjustment and the timing of the implementation of an adjustment program featuring an official devaluation. The effects of postponing adjustment depend on the source of the original shock. In the case of fiscal expansion, postponement implies a larger eventual official devaluation and greater deviations of macroeconomic variables from their steady-state values. For adverse terms-of-trade shocks, postponement does not affect the size of the eventual official devaluation but does magnify the amount of post-devaluation overshooting by key macroeconomic variables.

Dealing with Debt: The 1930s and the 1980s

Barry J. Eichengreen and **Richard Portes**
Working Paper No. 2867
February 1989
JEL Nos. 433, 441

This paper analyzes the sovereign defaults of the 1930s and their implications for the debt crisis of the 1980s. It reports nine major findings. 1) There is little evidence that financial markets have grown more sophisticated over time, or that banks have a comparative advantage over the bond market in processing information. 2) Debt default in the 1930s depended on a combination of factors, including the magnitude of the external shock, the level of debt, and the economic policy response, as well as on a range of noneconomic considerations. 3) Countries that interrupted service recovered more quickly from the Great Depression than countries that resisted default. This contrasts with the experience of the 1980s, when no clearcut relationship exists. 4) There is little evidence that countries that defaulted in the 1930s subsequently suffered inferior capital market access. 5) The readjustment of defaulted debts was protracted: the analogy with Chapter 11 corporate bankruptcy proceedings is no more applicable to the 1930s than to the 1980s. 6) Although default in some cases led to a substantial reduction of transfers from debtors to creditors, returns on sovereign loans on balance compared favorably with returns on domestic investments. 7) Creditor-country governments did more in the 1930s than in the 1980s to accelerate the settlement process. 8) Global schemes analogous to the Baker Plan were proposed widely but never implemented. 9) In contrast, market-based debt reduction in the form of debt buybacks played a useful role in the resolution of the crisis.

Inward versus Outward Growth Orientation in the Presence of Country Risk

Joshua Aizenman
Working Paper No. 2868
February 1989
JEL No. 400

This paper models the role of trade dependency in determining the access of a developing economy to the international credit market and its desirable growth strategy. With full integration of capital markets, the choice with respect to the inwardness of a technology is irrelevant: investment will be channeled to the more productive sectors, independently of their trade inwardness. With limited capital market integration, a given investment will generate two effects. The first is the standard, direct productivity effect that is associated with the change in future output. The second is the trade dependency externality, generated by the change in future bargaining outcomes caused by the change in the trade dependency of the nation. With partial integration, investment that increases trade dependency is desirable. If the credit markets are disjoint because of partial defaults, higher trade dependency is disadvantageous. Thus, higher trade dependency generates a positive externality with partial integration of capital markets, and a negative externality with disjoint credit markets. We show that credit market integration is determined by the size of the indebtedness relative to the trade dependency, as reflected by the repayment burden that is supported by the bargaining outcome. The repayment bargaining outcome is determined by the sectorial composition of the economy and by the effective size of the developing and the developed economies.

Dynamic Seigniorage Theory: An Exploration

Maurice Obstfeld
Working Paper No. 2869
February 1989
JEL Nos. 134, 321

This paper shows that the optimal extraction of seigniorage implies a strong tendency for inflation to fall over time toward its socially optimal level. I make the point using a multiperiod model in which: the government can finance deficits through bond issue or money creation; private sector expectations are rational; and the government sets the inflation rate each period in a discretionary manner. The model may be viewed as a synthesis of the "tax-smoothing" theory of government deficits, which predicts that the inflation tax approximately follows a martingale, and of models of discretionary policymaking that predict (absent reputation effects) that inflation is likely to exceed its socially optimal level. Both predictions are modified when the two approaches to explaining inflation are merged. Reputaion effects play no role in the analysis.

The Employer Size-Wage Effect

Charles C. Brown and **James L. Medoff**
Working Paper No. 2870
March 1989
JEL No. 824

We consider six explanations for the positive relationship between employer size and wages—that large employers: 1) hire higher-quality workers; 2) offer inferior working conditions; 3) use high wages more than smaller employers do to forestall unionization; 4) are more able to pay high wages; 5) face smaller pools of applicants relative to vacancies; and 6) are less able to monitor their workers. We find some support for the first of these explanations, but there remains a significant wage premium for those working for large employers.

Recent Trends in Insured and Uninsured Unemployment: Is There an Explanation?

Rebecca M. Blank and **David Card**
Working Paper No. 2871
March 1989
JEL No. 822

This paper presents new evidence on the reasons for the recent decline in the fraction of unemployed workers who receive unemployment insurance benefits. Using samples of unemployed workers from the March Current Population Survey, we estimate the fraction of unemployed workers who are potentially eligible for benefits in each year and compare this to the fraction who actually receive benefits. Perhaps surprisingly, we find that the decline in the fraction of insured unemployment is caused by a decline in the takeup rate for benefits. Our estimates indicate that takeup rates declined abruptly between 1980 and 1982, leading to a decline of six percentage points in the fraction of the unemployed who receive benefits.

We go on to analyze the determinants of the takeup rate for unemployment benefits, using both aggregated space-level data and microdata from the Panel Study of Income Dynamics. Changes in the regional distribution of unemployment account for roughly one-half of the decline in average takeup rates. The remainder of the change is largely unexplained.

Private Sector Training and Its Impact on the Earnings of Young Workers

Lisa M. Lynch
Working Paper No. 2872
March 1989

While there have been numerous studies devoted to examining the impact of governmental training programs on workers who have experienced difficulties in the labor market, there has been remarkably little research on the actual occurrence and consequences of training provided by the private sector in the United States. Using data from the new National Longitudinal Survey youth cohort, this paper analyzes how personal characteristics, including unemployment histories, and local demand conditions determine the probability of receiving training and its effect on wages and wage growth of young workers. More specifically, this paper considers the relative importance of training and tenure for wage determination, and the rate of return to training provided by companies compared to the rate of return to schooling and training received outside the firm. I also investigate the portability of company training from employer to employer and the existence of differentials in the returns to training by union status, race, and sex.

International Effects of Tax Reforms

Jacob A. Frenkel and **Assaf Razin**
Working Paper No. 2873
March 1989
JEL No. 430

This paper highlights the significance of open-economy considerations in the analysis of tax reforms. It focuses on domestic and international consequences of revenue-neutral conversions between income tax systems and value-added tax systems.

The principal conclusion is that the direction of changes in the world rate of interest, the domestic tax-adjusted rate of interest, domestic and foreign investment, growth rates of consumption, and other key macroeconomic variables affected by revenue-neutral tax reforms depend on whether the country adopting the tax reform runs a surplus or a deficit in the current account of its balance of payments. For example, a conversion from an income tax system to a value-added tax system lowers the world rate of interest if the country adopting the reform runs a surplus in the current account of its balance of payments; the same conversion raises the world rate of interest if the country's current account is in deficit.

The paper also examines the implications of such reforms in the presence of direct foreign investment and considers alternative specifications of tax treatments, one based on the source of income, and the other on the country of residence of the taxpayer. It demonstrates the robustness of the key propositions to these alternatives.

School District Leave Policies, Teacher Absenteeism, and Student Achievement

Ronald G. Ehrenberg, Randy A. Ehrenberg, Eric L. Ehrenberg, and **Daniel I. Rees**
Working Paper No. 2874
March 1989
JEL Nos. 820, 830

In an effort to reduce salary costs, many school districts have begun to offer teachers financial incentives to retire early. Often, however, these districts limit the number of cumulated, unused sick leave days for which teachers may receive cash payments, credits toward future health insurance, or retirement credits at retirement. Thus, early retirement incentive programs may interact with sick leave provisions and provide an unintended incentive for increased teacher absenteeism. To the extent that less learning occurs when regular teachers are absent and that student motivation to attend school also is reduced, student academic performance may suffer. This surely would be an unintended side effect of these policies.

This paper, based on extensive data collection by the authors, presents econometric analyses of variations in teacher and student absenteeism across the more-than-700 school districts in New York state in 1986-7. It also analyzes how such variations influence students' test scores.

The Size and Incidence of the Losses from Noise Trading

J. Bradford De Long, Andrei Shleifer, Lawrence H. Summers, and **Robert J. Waldmann**
Working Paper No. 2875
March 1989
JEL No. 313

Recent empirical research has identified a significant amount of volatility in stock prices that cannot be explained easily by changes in fundamentals. One interpretation is that asset prices respond not only to news but also to irrational "noise trading." We assess the welfare effects and incidence of such noise trading using an overlapping-generations model that gives investors short horizons. We find that the additional risk generated by noise trading can reduce the capital stock and consumption of the economy, and we show that part of that cost may be borne by rational investors. We conclude that the welfare costs of noise trading may be large if the magnitude of noise in aggregate stock prices is as large as suggested by some of the recent empirical literature on the excess volatility of the market.

Cost-Reducing and Demand-Creating R and D with Spillovers

Richard C. Levin and **Peter C. Reiss**
Working Paper No. 2876
March 1989

This paper analyzes R and D policies in situations in which the returns to R and D that reduces costs and creates demand cannot be appropriated perfectly and where market structure is endogenous. We generalize from previous characterizations of appropriability to permit the possibility that R and D by a firm and its rival are not perfect substitutes. We also describe how equilibrium expenditures on process and product R and D, as well as equilibrium market structure, depend on technological opportunities and spillovers. In contrast to previous work, our research shows that diminished appropriability does not necessarily reduce R and D expenditures. For example, under some conditions an increase in the extent of process (product) spillovers will lead to an increase in product (process) R and D. We estimate several variants of the model using data on manufacturing line of business and data from a survey of R and D executives.

The Production-Smoothing Model Is Alive and Well

Ray C. Fair
Working Paper No. 2877
March 1989
JEL No. 130

This paper uses monthly data in physical units for seven industries to examine the production-smoothing hypothesis. The results strongly support this hypothesis. I find significant effects of expected future sales on current production for four industries; the estimated decision equations for all seven industries imply that there is production smoothing. The previous negative results on the hypothesis appear to be caused by poor data, particularly data on shipments and inventory from the Department of Commerce.

Price and Output Adjustment in Japanese Manufacturing

William H. Branson and **Richard C. Marston**
Working Paper No. 2878
March 1989
JEL No. 400

This paper investigates the importance of markup behavior in Japanese manufacturing. According to the evidence, Japanese firms have varied the markups of prices over marginal costs in order to limit the effects of exchange rate changes on output. This is quite different from U.S. manufacturing in which output and employment have absorbed the main impact of recent changes in the exchange rate.

We examine markups in nine sectors of manufacturing that are major producers of exports. In all nine sectors, Japanese prices are highly sensitive to foreign prices and exchange rates and to more traditional demand and supply variables. The paper shows that variable markups rather than high price elasticities account for this price behavior, since output is relatively insensitive to prices or exchange rates.

Is the Bank of Japan a Closet Monetarist? Monetary Targeting in Japan, 1978-88

Takatoshi Ito
Working Paper No. 2879
March 1989
JEL No. 311

In 1975 the Bank of Japan (BOJ) published a report stating that it would pay close attention to money supply (M2), and in 1978 it started announcing quarterly the "forecast" (targets) of M2 growth rates. Since 1975, the M2 growth rate has declined gradually, and inflation has subsided without causing a major fluctuation in output. Has the BOJ practiced a monetarist rule, that is, announcement and maintenance of the M2 growth target?

This paper reveals that it has not. The BOJ "forecasts" did not behave like "targets" under a strict monetarist rule. Testing a monetarist rule with "forecasts" is more powerful than testing with the actual process, under some weak assumptions. One of the necessary assumptions is that "forecasts" are based on rational expectations; my data do not reject the rational expectations hypothesis.

Positive Feedback Investment Strategies and Destabilizing Rational Speculation

J. Bradford De Long, Andrei Shleifer, Lawrence H. Summers, and **Robert J. Waldmann**
Working Paper No. 2880
March 1989
JEL No. 312

Analyses of the role of rational speculators in financial markets usually presume that such investors dampen price fluctuations by trading against liquidity or noise traders. This conclusion does not necessarily hold when noise traders follow positive-feedback investment strategies: buy when prices rise and sell when prices fall. In such cases, it may pay rational speculators to try to jump on the bandwagon early and to purchase ahead of noise trader demand. If rational speculators' attempts to jump on the bandwagon early actually trigger investment strategies with positive feedback, then an increase in the number of forward-looking rational speculators can lead to increased volatility of prices around fundamentals.

Policy Analysis with a Multicountry Model

John B. Taylor
Working Paper No. 2881
March 1989
JEL No. 430

This paper summarizes the results of an empirical study of alternative international monetary arrangements using a multicountry, rational expectations, econometric model of the G-7 countries: Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. The model is fit to quarterly data and the effect of different monetary rules on the performance of the economy is determined by stochastic simulations of the estimated model. The results indicate that, with the current international economic structure, internal stability as well as external stability would be greater if Germany, Japan, and the United States oriented their monetary policies toward domestic price stability, or perhaps toward domestic nominal GNP stability, rather than toward fixing exchange rates. I use empirical measures of demand and supply elasticities and of the average size of the shocks to the demand and supply curves in the analysis. Thus the advantage that one international monetary arrangement has for dealing with one type of shock is assessed and measured against the advantage that another arrangement has for dealing with other types of shocks. It turns out that a more flexible exchange rate system between Germany, Japan, and the United States does better than a fixed exchange rate system.

Real Business Cycles: A New Keynesian Perspective

N. Gregory Mankiw
Working Paper No. 2882
March 1989
JEL Nos. 130, 310

This paper is a critique of the latest new classical theory of economic fluctuations. According to this theory, the business cycle is the natural and efficient response of the economy to exogenous changes in the available production technology. This paper discusses several versions of the theory and argues that this line of research is unlikely to yield an empirically plausible explanation of observed economic fluctuations.

Empirical Research on Trade Liberalization with Imperfect Competition: A Survey

J. David Richardson
Working Paper No. 2883
March 1989
JEL Nos. 420, 610

This paper attempts a synthetic census of the calibration/counterfactual style of empirical research on the benefits of trade liberalization with imperfect competition and scale economies. I survey computable general equilibrium studies and a large number of partial equilibrium studies, and I discuss algebraically the microeconomic foundations common to almost all of the studies, and discuss the corresponding general equilibrium structure graphically.

The first typical conclusion from the studies I survey is that calculated gains in national purchasing power are usually two to three times the size of those estimated in traditional frameworks with perfect competition. Only occasionally are welfare losses calculated from trade liberalization, although such losses are quite possible in theory, as much recent literature has shown.

The second typical conclusion is that calculated adjustment pressures from trade liberalization are considerably higher than implied in most commentary, and higher than estimates from traditional models. Adjustment pressures describe stimuli for workers to shift activities, for firms to grow or die, for industries to expand or contract, and for shares of trading partners to be altered.

Measurement Error in Cross-Sectional and Longitudinal Labor Market Surveys: Results from Two Validation Studies

John Bound, Charles C. Brown, Greg J. Duncan, and **Willard L. Rodgers**
Working Paper No. 2884
March 1989
JEL No. 824

This paper reports on the errors in survey reports of labor market variables such as earnings and work hours. Our primary data source is the Panel Study of Income Dynamics Validation Study, a two-wave panel survey of a sample of workers employed by a large firm that also allowed us access to its very detailed records of its workers' earnings. The second data source uses individuals' 1977 and 1978 (March Current Population Survey) report of earnings, matched to Social Security earnings records.

In both datasets individuals' reports of earnings are reported fairly accurately, and the errors are negatively related to true earnings. The latter property reduces the bias caused by measurement error when earnings are used as an independent variable but (unlike the classical-error case) leads to some bias when earnings are the dependent variable. Biases induced by measurement error when the variable of interest is change in earnings are larger, but not dramatically so. Various measures of hourly earnings were much less reliable than annual earnings. Retrospective reports of unemployment showed considerable underreporting, even of long spells.

The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?

John Bound and **Alan B. Krueger**
Working Paper No. 2885
March 1989
JEL No. 824

This paper examines the properties and prevalence of measurement error in longitudinal earnings data. The analysis compares Current Population Survey data to administrative Social Security payroll tax records for a sample of heads of households over a two-year period. In contrast to the typically assumed properties of measurement error, the results indicate that errors are serially correlated over two years and negatively correlated with true earnings (that is, mean reverting). Moreover, reported earnings are more reliable for females than for males. Overall, the ratio of the variance of the signal to the total variance is .82 for men and .92 for women. These ratios fall to .65 and .81 when the data are specified in first differences. The estimates suggest that longitudinal earnings data may be more reliable than previously believed.

Recent Trends in Housing Conditions among the Urban Poor

Rebecca M. Blank and **Harvey S. Rosen**
Working Paper No. 2886
March 1989
JEL Nos. 932, 914

We examine the trends in housing conditions among the urban poor over the last decade, relate these trends to the economic environments of the cities, and compare the poor to other income groups. We find that there has been a substantial decrease in "housing independence": among the poor, the percentage of family heads who live with their parents has risen, and the percentage of family heads who are also household heads has fallen. In addition, the incidence of homeownership among the poor has decreased, and the incidence of multiple-family households has increased. These same trends show up among higher-income families, although they are typically smaller in magnitude.

This paper provides little evidence for the popular hypothesis that changes in housing attributes over the last decade are related predominantly to changes in housing markets. Including a variety of economic variables does little to explain the trends in housing circumstances of different income groups.

Developing Country Borrowing and Domestic Wealth

Mark Gertler and **Kenneth Rogoff**
Working Paper No. 2887
March 1989
JEL No. 433

We show that external debt to private creditors rises more than proportionately with income across developing countries. We develop a simple theoretical model with this phenomenon and with the well-documented relationship between capital market development and growth. Our framework stresses asymmetries of information among individual borrowers as the source of frictions in world capital markets. Because of moral hazard problems, marginal products of capital and borrowing-lending spreads are higher in poorer countries. In a two-country version of the model we demonstrate the possibility of a "siphoning effect" that exacerbates the costs of transfers. Also, because of the siphoning effect, increased wealth in the rich country can stunt investment in the poor country.

Real Wages over the Business Cycle

Robert B. Barsky and **Gary Solon**
Working Paper No. 2888
March 1989
JEL No. 131

This paper examines the cyclical behavior of real wages in the United States since World War II. Like most previous aggregate studies, ours finds little cyclicality in aggregate data on industry real wages. On the other hand, longitudinal microdata from the Panel Study of Income Dynamics reveal substantial procyclicality. We find that this procyclicality is obscured in industry average wage statistics, and to a lesser extent in economywide averages, because those statistics are constructed in a way that gives greater weight to low-wage workers during expansions.

The almost complete absence of evidence for countercyclical real wages suggests that movements along labor demand curves have not played a dominant role in cyclical employment fluctuations over the past 40 years. Instead, the procyclicality of real wages indicates that cyclical fluctuations in employment have been generated mainly by shifts in labor demand. However, the sources of these shifts and of the positive slope of the effective labor supply curve remain open to alternative interpretations.

Financial Factors in Economic Development

Rudiger Dornbusch and **Alejandro Reynoso**
Working Paper No. 2889
March 1989
JEL Nos. 430, 120

Financial factors have been assigned strategic importance in economic development. Yet very different factors have been important in the respective experiences: in Asia, unrepressed financial markets have been given prominence in mobilizing saving and allocating investment. In Latin America, the central issue is the role of inflationary finance, the scope for deficits to enhance growth, and increasingly the feedback from high and unstable inflation to poor economic performance. This paper reviews and contrasts the two approaches and concludes that the strong claims for the benefits of financial liberalization are not supported by evidence. Financial factors are important but probably only when financial instability becomes a dominant force.

The scope for inflationary finance is small and the risks are larger than commonly accepted. When hyperinflation takes over and foreign exchange crises disrupt the price system and shorten the economic horizon to a week or a month, normal economic development is suspended. Moreover, capital flight that is difficult to reverse moves savings outside the home economy. These extreme cases should be our focus and we should explore more closely the thresholds at which financial factors become dominant and the channels through which this occurs. Superior growth performance, in this perspective, may be more a reflection of adaptability than of financial deepening.

Conditional Mean-Variance Efficiency of the U.S. Stock Market

Charles M. Engel, Jeffrey A. Frankel, Kenneth A. Froot, and **Anthony Rodriguez**
Working Paper No. 2890
March 1989

We apply the method of constrained asset share estimation (CASE) to test the mean-variance efficiency (MVE) of the stock market. This method allows conditional expected returns to vary in unrestricted ways, given investor preferences. We also allow conditional variances to follow an ARCH process. The data reasonably estimate the coefficient of relative risk aversion, although they are unable to reject investor risk neutrality. We reject the restrictions implied by MVE, although changing conditional variances statistically improve upon measured market efficiency. We find that unrestricted asset-share and ARCH models help to forecast excess returns. Once MVE is imposed, however, this forecasting ability disappears.

The Variability of Velocity in Cash-in-Advance Models

Robert J. Hodrick, Narayana Kocherlakota, and **Deborah Lucas**
Working Paper No. 2891
March 1989
JEL No. 311

Early cash-in-advance models have the feature that the cash-in-advance constraint always binds, implying that the velocity of money is constant. Lucas (1984) and Svensson (1985) propose a change in information structure that potentially allows velocity to vary. By calibrating a version of these models using a new solution algorithm, and using U.S. time-series data on consumption growth and money growth, we find that in practice the cash-in-advance constraint almost always binds. This result is robust to changes in the forcing process, the inclusion of credit goods along with cash goods, various preference specifications, and changes in the precision of the agents' information. We conclude that there is little practical gain in using these more complicated informational specifications in future applications of a cash-in-advance technology.

The American Way of Aging: An Event History Analysis

David T. Ellwood and **Thomas J. Kane**
Working Paper No. 2892
March 1989
JEL No. 918

This paper presents a methodology for studying the sequence and timing of life events past age 65. After estimating models of marital status, disability, living arrangements, and income from the scattered segments of old age captured within the 17-year window of the Panel Study of Income Dynamics, we simulated as many as 35 years of old age from a sample of those turning 65 between 1980 and 1984. The simulated life expectancies correspond quite well with life-table estimates published by the National Center for Health Statistics. Even in this initial effort, we report some interesting findings. First, the prospects for rich and poor at age 65 were very different, since those with high incomes live four years longer than those with low incomes. Second, women who were institutionalized were hardly identifiable at age 65, having similar income, marital status, and disability status as other women at age 65. Third, women are much more vulnerable to changes in marital status, suffering a permanent 20 percent decline in their standard of living upon widowhood compared to a 10 percent decline for men. Fourth, poor widows at age 80 were likely to have been widows or poor already when they turned 65.

Empirical Implications of Alternative Models of Firm Dynamics

Ariel Pakes and **Richard Ericson**
Working Paper No. 2893
March 1989

This paper considers two models for analyzing the dynamics of firm behavior that allow for heterogeneity among firms, idiosyncratic (or firm-specific) sources of uncertainty, and discrete outcomes (exit and/or entry). Models with these characteristics are needed for the structural econometric analysis of several economic phenomena, including the behavior of capital markets when there are significant probabilities of failure, and the analysis of productivity movements in industries with large amounts of entry and exit. In addition, these models provide a means of correcting for the self-selection induced by liquidation decisions in empirical studies of firms' responses to alternative policy and environmental changes. We show that the two models have different nonparametric implications that depend only on basic behavioral forms of interest (one distinction between them corresponds to the distinction between heterogeneity and an ergodic form of state-dependence: a form in which the effect of being in a state in a particular period erodes away as time from that period lapses). The nonparametric implications enable us to construct testing and selection correction procedures that are easy to implement (they do not require the computationally difficult, and functional-form-specific, estimation algorithms that have been used to empirically analyze stochastic control models with discrete outcomes in the past). The paper concludes by checking for the implications of the two models on an eight-year panel of Wisconsin firms. We find one model to be consistent with the data for retail trade.

Exchange Rate Volatility and Misalignment: Evaluating Some Proposals for Reform

Jacob A. Frenkel and **Morris Goldstein**
Working Paper No. 2894
March 1989
JEL No. 430

In this paper, we analyze several proposals for reducing the volatility and/or misalignment of key-currency exchange rates: a system of target zones; the imposition of controls or taxes on international capital flows; and a strengthening of international coordination over economic policies. We also review key characteristics of the behavior of the major-currency exchange rates over the period of floating rates and examine the various criteria or standards for drawing inferences about excess volatility and misalignment. In evaluating exchange rate volatility, we focus on the influence of the exchange rate regime, the behavior of fundamentals, the volatility of both goods prices and other asset prices, the costs of exchange rate volatility, and the nature of shocks facing the economy. Turning to misalignment, we examine the strengths and weaknesses of the purchasing power parity approach, the underlying balance approach, and the sustainability approach. We argue that inferences about excess exchange rate volatility and misalignment are subject to wide margins of error and that the exchange rate experience of the past 15 years is subject to multiple interpretations.

The Effect of Takeovers on the Employment and Wages of Central-Office and Other Personnel

Frank R. Lichtenberg and **Donald Siegel**
Working Paper No. 2895
March 1989
JEL Nos. 510, 610

This paper presents evidence based on establishment-level Census Bureau data concerning the effects of ownership change on the employment and wages of both central-office workers and manufacturing plant employees. We find that central offices that changed owners between 1977 and 1982 had substantially lower—about 16 percent lower—employment growth during that period than central offices not changing owners. (There was, however, no significant difference in the growth of *R and D* employment.) In contrast, employment growth in *production* establishments changing owners was only 5 percent lower than it was in production establishments not changing owners. (The relative employment decline in production establishments changing owners occurred in the two or three years *before* the takeover; after the takeover, employment recovered a bit, but not enough to offset the previous decline.) This implies that the ratio of central-office to plant employees declines about 11 percent in firms changing owners: about 7.2 administrators per 1000 plant employees are eliminated. These findings are consistent with the view that reduction of administrative overhead is an important motive for changes in ownership. Failure to account for reductions in central-office employment results in a substantial (about 40 percent) underestimate of the productivity gains associated with ownership change. We also provide evidence concerning the relationship between firm size and administrative intensity.

Effects of Family and Community Background on Men's Economic Status

Mary Corcoran, Roger H. Gordon, Deborah Laren, and **Gary Solon**
Working Paper No. 2896
March 1989
JEL No. 850

This study uses intergenerational data from the Panel Study of Income Dynamics to investigate the effects of family and community background on men's economic status. It is distinguished from most previous studies by its emphasis on community influences and on influences from poverty and use of welfare. Also, our data on parental characteristics are more comprehensive and accurate than those of many earlier studies.

We find substantial disadvantages in economic status for black men, men from lower-income families, and men from more welfare-dependent families or communities. Otherwise, we do not find much evidence of community influences. However, this might be because of the grossness of the geographic detail at which our community variables are measured.

Social Conflict and Populist Policies in Latin America

Jeffrey D. Sachs
Working Paper No. 2897
March 1989

The central hypothesis of this paper is that high-income inequality in Latin America contributes to intense political pressures for macroeconomic policies to raise the incomes of lower-income groups, which in turn contributes to bad policy choices and weak economic performance. This paper looks in detail at one common type of policy failure: the populist policy cycle. This particular type of Latin American policymaking, characterized by overly expansionary macroeconomic policies that lead to high inflation and severe balance-of-payments crises, has been repeated so often, and with such common characteristics, that it plainly reveals the linkages from social conflict to poor economic performance.

Black/White Differences in Wealth and Asset Consumption

Francine D. Blau and **John W. Graham**
Working Paper No. 2898
March 1989
JEL No. 917

Using data from the 1976 and 1978 National Longitudinal Surveys of young men and women, this study examines racial differences in the magnitude and composition of wealth and the reasons for them. On average, young black families have 18 percent as much wealth as young white families and hold their wealth in proportionately different forms. Even after controlling for racial differences in income and other demographic factors, as much as three-quarters of the wealth gap remains unexplained. We speculate on the causes for this, concluding that racial differences in intergenerational transfers most likely play an important role.

Taxes and Capital Formation: How Important Is Human Capital?

James Davies and **John Whalley**
Working Paper No. 2899
March 1989

This paper explores how explicit incorporation of human capital in a life-cycle growth model affects dynamic general equilibrium analysis of the effects of taxes on capital formation and welfare. In contrast to the results of partial equilibrium analysis, estimates of the full dynamic welfare costs of capital income taxes are little affected by incorporating human capital. While the short-run effects of replacing income taxes with wage or consumption taxes are significantly affected by making human capital endogenous, these effects are short lived. In the long run, the rate of return on nonhuman capital falls to approximately its initial net-of-tax level, and steady-state human capital investment plans are little affected by the tax changes. Although incorporating human capital does not greatly alter results in our numerical simulations, we discuss a wide range of extensions and modifications of the model that in principle could modify this conclusion.

Tax Reform and the Market for Tax-Exempt Debt

James M. Poterba
Working Paper No. 2900
March 1989
JEL Nos. 323, 324

This paper provides clear evidence that the yield spread between long-term taxable and tax-exempt bonds responds to changes in expected individual tax rates. That finding refutes theories of municipal bond pricing that focus exclusively on commercial banks or other financial intermediaries. The results support the conclusion that in the two decades prior to 1986, the municipal bond market was segmented, with different investor clienteles at short and long maturities. The Tax Reform Act of 1986 is likely to affect this market, however, since it has restricted tax benefits from tax-exempt bond investment by commercial banks. Individual investors increasingly are important suppliers of capital to states and localities, and their tax rates are likely to be the primary determinant of the yield spread between taxable and tax-exempt interest rates in the future.

The Impact of R and D Investment on Productivity—New Evidence Using Linked R and D-LRD Data

Frank R. Lichtenberg and **Donald Siegel**
Working Paper No. 2901
March 1989
JEL Nos. 621, 510

This paper uses confidential Census longitudinal microdata to examine the association between R and D and productivity for 1972-85. These data allow for significant improvements in measurement and model specification, yielding more precise estimates of the returns to R and D. Our results confirm the findings of existing studies: 1) positive returns to R and D investment; 2) higher returns to company-financed research; and 3) a productivity "premium" on basic research. These results are robust to our attempts to adjust for "influential" outliers. Also, it appears that the return to company-financed R and D (but not *total* R and D) is an increasing function of firm size.

The Term Structure of Interest Rates and the Effects of Macroeconomic Policy

Stephen J. Turnovsky
Working Paper No. 2902
March 1989
JEL No. 311

This paper analyzes the effects of monetary and fiscal policy shocks on the term structure of interest rates. It contrasts the effects of temporary versus permanent, and unanticipated versus anticipated, policy disturbances, and the responses of long versus short, and real versus nominal, rates. The main results are summarized in a series of propositions. The finding that an unanticipated permanent fiscal expansion has more of an impact on long-term rates may help to explain their observed excessive volatility. I also discuss the effects of structural changes on the relative variances and emphasize the effect that operates through the impact on private speculative behavior.

Testable Implications of Indeterminacies in Models with Rational Expectations

Robert P. Flood and **Robert J. Hodrick**
Working Paper No. 2903
March 1989
JEL Nos. 212, 313

The possibility that movements in market prices of assets or goods may be caused by self-fulfilling prophecies, called bubbles or sunspots, has long intrigued market observers. If bubbles or sunspots exist, market prices differ from their fundamental values, and markets do not necessarily allocate resources to their best possible uses. Some might argue that public policies would be needed to alleviate such problems.

This paper surveys the current state of the empirically oriented literature concerning rational dynamic indeterminacies, by which we mean a situation of self-fulfilling prophecy within a rational expectations model. The empirical work in this area concentrates primarily on indeterminacies in price levels, exchange rates, and equity prices. First, we examine a particular type of explosive indeterminacy, usually called a rational bubble, in a familiar model of equity pricing. Then we consider empirical work relating to price level and exchange rate indeterminacies, before examining empirical studies of indeterminacies in stock prices. Finally, we take up some interpretive issues. We find that existing bubbles tests do not establish that rational bubbles exist in asset prices.

Asymmetries in Policy between Exportables and Import-Competing Goods

Anne O. Krueger
Working Paper No. 2904
March 1989

This paper reexamines current understanding of the political economy of protection. To date, work has centered on determinants of the height of protection and its form: tariffs, quantitative restrictions, and voluntary export restraints. I argue that examining the structure of protection misses one important piece of evidence: why import-competing industries tend to be more highly protected than industries producing exportables. When the question is cast in this light, a number of new insights emerge, including the importance of earlier protective measures in influencing current protectionist pressures. "Identity bias," whereby political decisions can be asymmetric between winners and losers depending on whose identity is known, is introduced.

Pricing to Market in Japanese Manufacturing

Richard C. Marston
Working Paper No. 2905
March 1989
JEL Nos. 431, 421

This paper investigates pricing by Japanese manufacturing firms in export and domestic markets. It reports equations explaining the margin between export prices (in yen) and domestic prices for a wide range of final goods, including many of the electronic and transport products that have figured so prominently in recent trade discussions. The evidence shows that Japanese firms respond to changes in real exchange rates by "pricing to market," varying their export prices in yen relative to their domestic prices. The empirical specification makes it possible to disentangle planned changes in the margin between export and domestic prices from inadvertent changes in this margin caused by unanticipated changes in exchange rates. The degree of pricing to market varies widely across products, but there is strong evidence that pricing to market occurs. The paper also investigates whether pricing to market has increased in scale since 1985 when the yen began a sustained appreciation but finds that only 5 of 17 products experienced a shift in price behavior over that period.

Market Value versus Financial Accounting Measures of National Saving

David F. Bradford
Working Paper No. 2906
March 1989

Although National Income and Product Account (NIPA) saving measures, and especially NIPA saving rates, are used widely both in scholarly and journalistic treatments, they are seriously defective as representations of the variables derived from economic analysis, either for measuring economic performance or as elements of the explanation for consumption behavior. The cost-based value of a restricted class of assets recorded in the NIPAs is a version of the financial accounting for the tangible assets of a business firm. Economic analysis instead calls for the current asset market value of business enterprises (and their equivalents) as the measure of wealth, and the annual change in that value as the measure of saving. National Balance Sheet data on wealth at asset market value show that NIPA saving measures are not good proxies for market value measures. The picture of recent national saving experience that emerges from market value data is quite different. The paper discusses various conceptual issues and issues of data quality.

Terms-of-Trade Disturbances, Real Exchange Rates, and Welfare: The Role of Capital Controls and Labor Market Distortions

Sebastian Edwards and **Jonathan D. Ostry**
Working Paper No. 2907
March 1989
JEL Nos. 400, 410

Many arguments in favor of maintaining capital control within the European Economic Community have not paid sufficient attention to the welfare consequences of this type of market intervention. Our paper provides a simple, optimizing framework in which the welfare consequences of capital controls can be assessed.

We consider two main issues. First, how do capital controls affect the adjustment of macroeconomic variables to real disturbances? Second, what is the nature of second-best arguments for maintaining capital controls, given that certain distortions will remain after the European single market is in place in 1992?

Openness, Outward Orientation, Trade Liberalization, and Economic Performance in Developing Countries

Sebastian Edwards
Working Paper No. 2908
March 1989
JEL Nos. 410, 430

This paper deals with the role of trade regimes in determining economic performance and growth in the developing countries. I critically review the policy and empirical literatures on trade orientation and economic growth and argue that a key limitation of these works has been the inability to create measures of trade orientation that are: 1) objective; 2) continuous; and 3) comparable across countries. I develop a growth model that relates trade orientation to the ability to absorb technological progress from the rest of the world for the case of a small country. I test the model using a new index of trade orientation that is free from the limitations described above. The results obtained using a cross-country dataset strongly support the hypothesis that, with other things given, countries with a less distorted external sector grow faster than countries with a more distorted external sector. I also discuss the new theories of economic growth and assess their usefulness for analyzing the relationship between trade orientation and growth in the developing countries.

The International Monetary Fund and the Developing Countries: A Critical Evaluation

Sebastian Edwards
Working Paper No. 2909
March 1989
JEL No. 400

This paper critically evaluates the IMF's role in the adjustment process of the developing countries. In particular, it asks: What model or framework does the IMF use to generate its advice, and is that advice eclectic? Is there evidence that countries that follow the IMF's advice do better than countries that proceed in other ways? Are the policy decisions of the IMF based on technical knowledge, or do they reflect the political views of the larger members? Is the IMF position regarding the debt crisis conducive to a realistic solution? What can we expect from the IMF in the future? The paper also includes an evaluation of recent IMF programs, as well as an econometric analysis of the contractionary devaluation issue.

Transmission of Volatility among Stock Markets

Mervyn A. King and **Sushil Wadhwani**
Working Paper No. 2910
March 1989
JEL Nos. 310, 131

This paper investigates why, in October 1987, almost all stock markets fell together despite widely differing economic circumstances. The idea is that "contagion" among markets occurs as the result of attempts by rational agents to infer information from price changes in other markets. This provides a channel through which a "mistake" in one market can be transmitted to other markets. Hourly stock price data from New York, Tokyo, and London during an eight-month period around the crash offer support for the contagion model. In addition, the magnitude of the contagion coefficients increases with volatility.

Sunk-Cost Hysteresis

Richard Baldwin
Working Paper No. 2911
March 1989

Despite its important theoretical, empirical, and policy implications, sunk-cost hysteresis has not been characterized for the case of model-consistent or rational expectations. (Previous studies assume that firms believe the forcing variable is generated by some ad hoc, time-invariant process such as an iid or Brownian motion process.) This omission is significant because, if firms do have forward-looking expectations, the existing characterizations cannot be used for empirical testing, or as a guide in developing appropriate econometric techniques. Furthermore, policy conclusions based on such characterizations may be misleading.

This paper demonstrates the possibility and characterizes the nature of sunk-cost hysteresis for a broad class of assumptions on the forcing variable process. Most notably, this class includes rational or model-consistent expectations. Specifically, I show that the firm's problem with a quite general forcing variable process can be reduced to be formally identical to the iid case. Additionally I analytically show that: 1) the hysteresis band tends to widen with greater sunk costs; 2) the effect of greater volatility on the band width depends upon the specific nature of the process generating the uncertainty; and 3) greater persistence in the shocks has the effect of making well-entrenched firms more likely to exit and of narrowing the band for marginal firms. Finally, I show that the possibility of sunk-cost hysteresis is robust to a number of modifications of the basic sunk-cost model.

Understanding Investment Incentives under Parallel Tax Systems: An Application to the Alternative Minimum Tax

Andrew B. Lyon
Working Paper No. 2912
March 1989
JEL No. 323

Many countries' income tax systems consist of multiple parallel tax systems. Most commonly, statutory tax rates may vary with income. As a special case, taxpayers with net losses in a given year and no past tax liability face a zero tax rate in that year but may use the loss to offset future taxes. In the United States, the newly enacted alternative minimum tax (AMT) for corporations is a parallel tax system. In addition to taxing income at statutory tax rates different from those under the regular tax system, it provides separate depreciation schedules, allowable deductions, and tax exclusions. This paper examines the conditions under which the existence of a parallel tax system maintains neutral investment incentives for taxpayers who may switch between tax systems. With regard to the AMT, I show that investment incentives for firms experiencing a spell on the AMT may be greater or less than those of firms on the regular tax system, depending on the duration of the spell, the time at which the investment is made, and the source of financing.

Endogenous Product Cycles

Gene M. Grossman and **Elhanan Helpman**
Working Paper No. 2913
March 1989
JEL Nos. 411, 111

We construct a model of the product cycle featuring endogenous innovation and endogenous technology transfer. Competitive entrepreneurs in the North expend resources to bring out new products whenever expected present discounted value of future oligopoly profits exceeds current product development costs. Each northern oligopolist continuously faces the risk that its product will be copied by a southern imitator, at which time its profit stream will come to an end. In the South, competitive entrepreneurs may devote resources to learning the production processes that have been developed in the North. There too, costs (of reverse engineering) must be covered by a stream of operating profits. We study the determinants of the long-run rate of growth of the world economy, and the long-run rate of technological diffusion. We also provide an analysis of the effects of exogenous events and of public policy on relative wage rates in the two regions.

Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach

Kenneth A. Froot and **Jeremy C. Stein**
Working Paper No. 2914
March 1989

We examine the connection between exchange rates and foreign direct investment that arises when globally integrated capital markets are subject to informational imperfections. These imperfections cause external financing to be more expensive than internal financing, so that changes in wealth translate into changes in the demand for direct investment. By systematically lowering the relative wealth of domestic agents, a depreciation of the domestic currency can lead to foreign acquisitions of certain domestic assets. We develop a simple model of this phenomenon and test for its relevance in determining international capital flows.

Public Sector Bargaining and the Local Budgetary Process

Joseph Gyourko and **Joseph S. Tracy**
Working Paper No. 2915
March 1989
JEL Nos. 824, 830

This paper investigates how the fiscal environment and the budgetary process affect wage and employment determination in the local public sector. The structure of the local tax system is influential, with significantly higher wages occurring in cities with access to local sales and/or income taxes. State-imposed property tax limits are associated with lower wages (but not overall payrolls per capita). We find evidence that skill enhancement may be an important policy tool. Local governments appear to use it successfully to mitigate the wage premiums associated with strong state collective bargaining legislation. We also find that controlling for the human capital of teachers substantially reduces the well-known positive correlation between teacher wages and community income.

Strategic Trade Policy When Domestic Firms Compete Against Vertically Integrated Rivals

Dani Rodrik and **Chang-Ho Yoon**
Working Paper No. 2916
April 1989
JEL Nos. 420, 610

This paper models the international competition between a domestic firm and its vertically integrated foreign rival. The domestic firm can choose to develop its own production capability for an intermediate input, or to import the input from the foreign firm at a price it sets. In this setting and under reasonable cost assumptions, the foreign firm will always choose to supply the domestic firm as long as it cannot monopolize the final-good market by withholding supply. A tariff placed on the imports of the input by the home government will be borne entirely by the foreign firm and will increase welfare. When the home government chooses to subsidize the domestic firm's fixed development costs for the input, the optimal subsidy will exceed the total fixed costs required but will not have to be disbursed in equilibrium. A tariff on the final good will enhance the home firm's profits not only by increasing the costs of its rival but also by reducing its own input costs.

Pensions as Retirement Income Insurance

Zvi Bodie
Working Paper No. 2917
April 1989
JEL No. 520

This paper develops the view that employer-sponsored pension plans are best understood as retirement income insurance for employees. From that perspective, I address a number of questions regarding the reasons for the existence, design, and funding and investment policies of such plans. Most importantly, why do employers provide pension plans for their employees, and why is participation usually mandatory? Why is the defined-benefit form of pension plan dominant, rather than the defined-contribution plan? Why are the payout options under most plans limited to life annuities? Why are most plans integrated with Social Security? Why don't corporate pension plans follow the extreme funding and asset allocation policies that seem to be optimal from the perspective of shareholder wealth maximization? Why do employers often make ad hoc increases in pension benefits not strictly required under the formula in defined-benefit plans? Finally, why don't private pensions offer inflation insurance?

The Linkage between Speculative Attack and Target Zone Models of Exchange Rates

Robert P. Flood and **Peter M. Garber**
Working Paper No. 2918
April 1989

This paper generalizes the target zone exchange rate model, formalized by Krugman (1988), to include finite-sized interventions in defense of the zone. We link the recent developments in the theory of target zones to the mirror-image theory of speculative attacks on asset-price-fixing regimes. We then use aspects of that linkage to intuitively interpret the "smooth pasting" condition usually invoked as a terminal condition.

Government Spending and Budget Deficits in the Industrial Economies

Nouriel Roubini and **Jeffrey D. Sachs**
Working Paper No. 2919
April 1989
JEL Nos. 431, 320

In this paper, we try to interpret several important trends in the size of governments and government deficits in the OECD economies: the rapid increase in the public spending-to-GDP ratio in the 1970s; the sharp rise in budget deficits and in debt-to-GNP ratios after 1973; and the early signs of a slowdown or reversal in the rise of the spending ratios in the 1980s. We show that the rise in size of the government was associated with the slowdown in output growth after 1973, and with the gradual adjustment of spending ratios to long-run values. These long-run values appear to depend on the political and institutional characteristics of the various economies (the ideological orientation of the government, the degree of wage indexation, and the average number of parties in the governing coalitions).

As for budget deficits, we argue that much can be explained by normal cyclical factors (the slowdown in growth and the rise in unemployment after 1973). In addition, though, the size of the budget deficits has been related to political as well as economic characteristics of the countries. Deficit reduction requires political consensus, at least among the parties belonging to the governing coalition. We note that such consensus is harder to achieve in multiparty coalition governments and that the failure to reach a consensus on budget cutting can help to explain why countries with multiparty coalition governments have experienced particularly large increases in the debt-to-GNP ratio.

Vertical Foreclosure and International Trade Policy

Barbara J. Spencer and **Ronald W. Jones**
Working Paper No. 2920
April 1989
JEL No. 411

We examine conditions under which a low-cost, vertically integrated manufacturer has an incentive to export an intermediate product to its higher-cost (vertically integrated) rival rather than to vertically foreclose, fully cutting off supplies. The nature of supply conditions in the importing country, the size of an import tariff on the final good, and optimal policy by the exporting country are all important for this decision. The exporting country may gain by taxing exports of the final (Cournot) product even though, under Cournot competition, an export subsidy is optimal in the absence of a market for intermediates. In this case, optimal policy also requires an export tax on intermediates, but the higher tax on final goods serves to divert sales to the more profitable market for intermediates, increasing the extent of vertical supply. It is optimal to tax the export of both goods or to subsidize the export of both goods. It is never optimal to tax one and subsidize the other.

The Local Decision to Tax: Evidence from Large U.S. Cities

Robert P. Inman
Working Paper No. 2921
April 1989

The structure of local taxation is an important determinant of the fiscal performance of decentralized public economies. In contrast to our understanding of local government spending, however, we know surprisingly little about how cities and states set taxes. This study specifies and estimates a model of the institutional, political, and economic determinants of the local decision to tax. Redistributive politics is an important determinant of local tax policy, at least for this sample of 41 large U.S. cities during 1961-86. The results cast serious doubt on the validity of the "representative" or average taxpayer approach to behavioral modeling of fiscal policy for large, income-diverse governments. The results allow us to predict the effects on local financing of removing federal tax deductibility of local taxes, an issue of current importance in the United States.

Patents: Recent Trends and Puzzles

Zvi Griliches
Working Paper No. 2922
April 1989
JEL No. 620

This paper reviews the historical data on patenting in the United States, particularly in the last 20 years, and the potential relationship, if any, of patents to the recent productivity slowdown. It makes two points: patents are not a "constant-yardstick" indicator of either inventive input or output; moreover, they are "produced" by a governmental agency that goes through its own budgetary and inefficiency cycles. The paper shows that the appearance of an absolute decline in patenting in the 1970s is an artifact of such a cycle. This still leaves us with the longer-run puzzle of a slower growth in patenting, especially by U.S. residents, relative to R and D expenditures. I conjecture that this reflects more the changing character of patents and R and D than an indication of diminishing returns to R and D and an exhaustion of technological opportunities.

The Internationalization of Production

Robert E. Lipsey
Working Paper No. 2923
April 1989
JEL No. 440

The degree of internationalization of the enterprise or business sectors of many countries, as measured by the ratio of direct investment abroad to domestic wealth or assets, or of assets or employment abroad to that at home, has been growing over the last 20 years or more. The exception to this trend is the United States, in which the extent of internationalization, after growing until the 1970s, has stagnated or decreased somewhat.

The level of internationalization of U.S. firms in the 1970s and 1980s was above that of Germany and especially above those of Japan and Korea. Canada was close to the United States, and U.K. firms were by far the most internationalized. The differences among the country levels and trends seem to reflect country size and divergences between the competitiveness of countries and of their companies, including those that result from exchange rate movements.

Consumption, Income, and Interest Rates: Reinterpreting the Time-Series Evidence

John Y. Campbell and **N. Gregory Mankiw**
Working Paper No. 2924
April 1989
JEL No. 130

This paper proposes that the time-series data on consumption, income, and interest rates are best viewed as generated not by a single representative consumer but by two groups of consumers. Half the consumers are forward-looking and consume their permanent income but are extremely reluctant to substitute consumption intertemporally. Half the consumers follow the "rule of thumb" of consuming their current income. The paper documents three empirical regularities that, it argues, are best explained by this model. First, expected changes in income are associated with expected changes in consumption. Second, expected real interest rates are not associated with expected changes in consumption. Third, periods in which consumption is high relative to income typically are followed by high growth in income. The paper concludes by briefly discussing the implications of these findings for economic policy and economic research.

The Stock Market and Investment

Robert J. Barro
Working Paper No. 2925
April 1989
JEL Nos. 520, 313, 023

Changes in real stock market prices have a lot of explanatory value for the growth rate of U.S. aggregate business investment, especially for long samples that begin in 1891 or 1921. Moreover, since 1921, when data on a *q*-type variable have become available, the stock market dramatically outperforms *q*. The change in real stock prices also retains its predictive value in the presence of a cash flow variable, such as aftertax corporate profits. Basically similar results apply to Canadian investment, except that the U.S. stock market turns out to have more predictive power than the Canadian market. I discuss some possible explanations for this puzzling finding, but none of the explanations seem all that convincing.

Confidence Crises and Public Debt Management

Francesco Giavazzi and **Marco Pagano**
Working Paper No. 2926
April 1989
JEL Nos. 321, 431, 432

Under free capital mobility, crises in confidence can result in devaluations even when fixed exchange rates are viable, if fiscal authorities can obtain temporary money financing. During a crisis, domestic interest rates increase, reflecting the expected devaluation. Rather than selling debt at punitive rates, fiscal authorities will turn to temporary money financing, leading to equilibriums with positive probability of devaluation. These equilibriums can be ruled out if the amount of debt maturing during the crisis is sufficiently small—a condition that can be met by reducing the stock of public debt, lengthening its average maturity, and/or smoothing the time distribution of maturing issues.

International Spillovers of Taxation

Jacob A. Frankel, Assaf Razin, and **Steven Symansky**
Working Paper No. 2927
April 1989
JEL No. 430

This paper deals with the international effects of taxation. Tax policies have profound effects on the temporal composition and on the intertemporal evolution of the macroeconomy. The analysis highlights key issues pertinent for the understanding of international effects of domestic tax policies and of international tax harmonization. The analytical framework adopts the saving-investment balance approach to the analysis of international economic interdependence and includes a detailed specification of public and private sector behavior focusing on the roles played by taxes on income, consumption, and international borrowing. We present stylized facts on the average consumption and income tax rates for the seven major industrial countries. They reveal a large international diversity of tax rates and tax structures.

We use the analytical framework to analyze the consequence of revenue-neutral conversions between income and consumption (value-added) tax systems. We demonstrate that the effects of such changes in the structure of taxes depend critically on international differences in saving and investment propensities, which in turn govern the time profile of the current account of the balance of payments. The key results also are illustrated by means of dynamic simulations. We then examine the international effects of budget deficits and public debt management and demonstrate analytically as well as by means of dynamic simulations that these effects depend critically on whether the government manages its deficit through alterations in income or consumption (value-added) taxes. Finally, motivated by proposals for tax harmonization associated with the single market in Europe of 1992, we consider the effects of international tax harmonization. The main results demonstrate that, in analogy with the effects of tax conversions, the effect of harmonization depends critically on the intercountry differences in saving and investment propensities. These differences yield conflicts of interests in the tax harmonization program.

The Demand for Lottery Products

Charles T. Clotfelter and **Philip J. Cook**
Working Paper No. 2928
April 1989

Lotteries constitute one of the fastest-growing categories of consumer expenditure in the United States. Not only do an increasing number of states have legalized state lotteries, but the per capita expenditures on lotteries in lottery states have increased at an annual rate of 13 percent after inflation between 1975 and 1988. This paper examines the demand for lottery products. A majority of the adult public in lottery states play in any one year, but relatively few of these players account for most of "the action." Socioeconomic patterns of play, measured from both sales data and household surveys, offer some surprises—for example, that the

Engle curve of lottery expenditures declines with income. There is some evidence that lottery sales increase with the payout rate, although it is not clear that it would be profitable for the states to increase payout rates. The addition of a new game, such as lotto, does not undercut sales of existing games, and the oft-heard claim that interest (and sales) will "inevitably" decline is contradicted by the data. The organizational form of the lottery is evolving in response to the quest for higher revenues: in particular, smaller states are forming multistate games. (This paper is a chapter from *Selling Hope: State Lotteries in America,* an NBER monograph scheduled to be published by Harvard University Press in December 1989.)

Simulating the Effects of Some Simple Coordinated versus Uncoordinated Policy Rules

Jacob A. Frenkel, Morris Goldstein, and **Paul R. Masson**
Working Paper No. 2929
April 1989
JEL No. 430

We simulate the effects of different policy rules: uncoordinated targeting of the money supply or nominal income; use of monetary policy to achieve coordinated targets for nominal or real exchange rates; and the use of monetary and fiscal policies to hit targets for internal and external balance. We find that rules that performed best for some shocks performed poorly for others; monetary policy was ineffective in limiting movements in real exchange rates; unconstrained use of fiscal policy was quite powerful in influencing real variables; and dynamic instability was a potentially serious problem. Robustness to different specifications and to constraints on instruments remains to be examined.

Perishable Investment and Hysteresis in Capital Formation

Bernard Dumas
Working Paper No. 2930
April 1989

Entry into a market seems to necessitate some investment in "marketing capital" (or distribution capital: advertising, dealerships, and so forth). This form of investment has the property that, if it is unused for some time, it quickly becomes worthless. When entry into a market requires marketing investment, firms that are currently out of this market tend to delay entry until price-versus-cost conditions have become extremely favorable. Conversely, firms that are in the market tend to delay exit until they can no longer bear large operating losses. This is because they know that, if they do exit, and if price-versus-cost conditions later become favorable again, they will have to incur the investment in marketing capital again.

This paper presents a general equilibrium model of capital formation in an economy subject to random shocks, when marketing capital (with the above properties) is used in distribution, in addition to the "normal" capital used in production. I show an analytical solution to the dynamic program representing the welfare optimum problem, along with the shadow prices corresponding to this program. These are also the prices that would support the general equilibrium of a decentralized market economy.

Coming Home to America: Dividend Repatriations by U.S. Multinationals

James R. Hines, Jr. and **R. Glenn Hubbard**
Working Paper No. 2931
April 1989
JEL Nos. 320, 520

This paper analyzes the financial flows from foreign subsidiaries of American multinational corporations to their parent corporations in the United States. The repatriations are important not only to U.S. investors, who thereby have access to those funds, but also to the U.S. government, which generally does not tax foreign earnings of controlled foreign corporations until they are repatriated.

The paper reviews the current tax system as applied to multinational firms, and considers the incentives it creates for various intrafirm financial transactions (in particular, the form of repatriations). These incentives appear to be inconsistent with historical repatriation patterns from aggregate time-series data on the overseas operations of U.S. multinationals. To resolve this inconsistency, we explore the determinants of distributions by foreign subsidiaries to their U.S. parent corporations, using new microdata on 12,041 controlled foreign corporations (and their 435 U.S. parents) collected from tax returns for 1984. This source exposes variations in distribution patterns not detectable in aggregate data. In particular, the data suggest that the U.S. government collected very little revenue on their foreign income while distorting their internal financial transactions.

Economic Capacity Utilization and Productivity Measurement for Multiproduct Firms with Multiple Quasi-Fixed Inputs

Ernst R. Berndt and **Melvyn A. Fuss**
Working Paper No. 2932
April 1989
JEL Nos. 226, 621, 641

In this paper we develop measures of output and utilization of capacity for firms producing multiple outputs and having one or more quasi-fixed inputs. Although we produce an impossibility theorem showing that, based only on the assumption of cost minimization, the concept of capacity output is undefined whenever the number of outputs, I, exceeds the number of fixed inputs, M, we are able to provide alternative constructive procedures for defining capacity output $I \leq M$. We also propose a number of additional primal and dual measures of utilization of the variable and fixed inputs, including a multifixed input analog to Tobin's q. We relate these alternative utilization measures to one another and show that unambiguous inequality relationships among them (relative to unity) typically can be specified a priori only under rather restrictive assumptions. We show that unless restrictive assumptions are made, the multifixed input analogs to Tobin's q have little informational content regarding incentives for net investment of any specific fixed input. Finally, we demonstrate the usefulness of the alternative utilization measures by showing how they can be incorporated to adjust traditional measures of multifactor productivity growth for variations in short-run utilization.

Technological Characteristics of Industries and the Competitiveness of the United States and Its Multinationals

Irving B. Kravis and **Robert E. Lipsey**
Working Paper No. 2933
April 1989
JEL No. 440

The share of U.S. multinational firms in world exports of manufactures has remained almost constant at about 17 percent for the last 20 years while the share of the United States as a country has declined substantially. The composition of world manufactured exports shifted toward high technology or R and D-intensive products during these years and away from low technology products. The comparative advantage of the United States and Japan, and even more of U.S. multinationals, was in high tech products throughout the period. However, the United States and its multinationals shifted even further toward such products during the period than did the world as a whole, and the Asian newly industrialized countries' exports moved still faster in this direction.

With respect to short-run fluctuations, we find that the export shares of U.S. multinationals have been less sensitive to exchange rate fluctuations than those of the United States as a whole. Shares in high tech exports also have been less sensitive than those in low tech exports. High R and D intensity was a factor raising the competitiveness of U.S. industries, and particularly of U.S. multinationals in those industries. High advertising intensity raised the competitiveness of U.S. multinationals, but usually not that of their industries. Higher growth in R and D intensity also led to an increase in multinationals' shares of world exports between 1977 and 1982.

Simple Rules, Discretion, and Monetary Policy

Robert P. Flood and **Peter Isard**
Working Paper No. 2934
April 1989
JEL No. 310

This paper explores the possibilities arising under a policy in which a partially state-contingent money supply rule is mixed with discretion. In addition to demonstrating that such mixed strategies can dominate both complete discretion and rigid adherence to the partially state-contingent rule, we investigate the appropriate setting of parameters in a partially state-contingent policy when it is acknowledged that the rule will not be followed on all occasions—that is, that sometimes the monetary authority will resort to discretion.

The Pension Cost of Changing Jobs

Steven G. Allen, Robert L. Clark,
and **Ann A. McDermed**
Working Paper No. 2935
April 1989

Workers covered by defined-benefit pension plans receive lower benefits at retirement if they leave their current job before reaching retirement age. This study estimates the magnitude of this pension loss for workers in the May 1983 supplement of the Current Population Survey, using pension formula estimates from the 1983 Employee Benefit Survey. The pension loss is generally greatest between the ages of 35 and 54 and represents roughly half a year's earnings for that age group. The loss tends to be quite high in the declining mining and manufacturing sectors. This probably resulted in lower voluntary attrition at a time of massive layoffs and plant closings.

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