Editors' Summary

THIS ISSUE of *Brookings Papers on Economic Activity* contains articles and reports presented at the thirty-sixth conference of the Brookings Panel on Economic Activity, which was held in Washington, D.C., on September 15 and 16, 1983. The papers address questions of immediate concern for decisionmakers, as well as other long-standing issues about the economic system and how its performance can be improved. Topics include experience with disinflationary policies in both the United Kingdom and the United States, the possible importance of attitudinal factors in the productivity slowdown, and the distortions caused by many aspects of business taxation.

THE GOVERNMENT of Margaret Thatcher has drastically altered the conduct of economic policy in the United Kingdom. She has changed the ultimate objectives of policy, the way in which policy instruments are applied, and the relation between the government and organized labor. Taken together, these actions constitute a revolution in economic policymaking. Two years ago Willem H. Buiter and Marcus H. Miller examined the consequences of this revolution in its early stages (*BPEA, 2:1981*). In the first article of this issue they take a fresh look at economic performance under Margaret Thatcher now that her policies have been in effect for more than four years. The authors contrast Thatcher's aims with those of most postwar governments of the United Kingdom, which sought the cooperative support of "social partners" in the private sector. These governments have been committed to the aims of the 1944 White Paper, a policy document similar in spirit to that of the U.S. Employment Act of 1946, which emphasized the active use of policy instruments to pursue high employment, low inflation, economic growth, and a sustainable external balance. With time, the authors note, cooperation among

the social partners diminished; governments conducted policy for short-term electoral advantage and unions, taking employment for granted, pushed wages ahead of productivity and resisted new technology and work practices.

Buiter and Miller see Thatcher's policies as a reaction to these failures and as altering the fundamental ground rules under which public and private decisions are made. Under the Thatcher regime the government no longer relies on cooperation with the social partners, abandoning, for instance, any attempts at an incomes policy; it no longer employs countercyclical stabilization policy to achieve high employment; instead it uses fixed financial targets with the objective of stopping inflation. Buiter and Miller review economic performance thus far and document how the new policies have led to deep recession while slowing inflation and weakening the power of labor unions. They also consider three issues central to assessing prospects for the future. How have changes in policy affected the cost of reducing inflation? Has there been a productivity breakthrough? And does the rejection of previous policies that passively accommodated inflation require the government to abandon countercylical policies permanently?

Although the authors note some very recent evidence that economic conditions are improving, they stress that the recession from 1979 to 1983 was as severe as the depression years after 1929 in the United Kingdom. On the positive side, they stress that the inflation rate declined steadily from its peak in 1980; by 1983 it had returned to the rates that prevailed before the first OPEC oil-price increase. Buiter and Miller attribute this economic performance to the government's commitment to domestic monetary targets and to targets for public sector borrowing requirements (PSBR).

Actually, the stance of monetary policy in this period is not easily assessed. The authors show that the target ranges set for a number of monetary aggregates were often overrun and subsequently adjusted. Nominal interest rates were generally high, although during much of the period they appeared low when compared with the existing rate of inflation. The important feature of monetary policy was that the commitment to monetary targets was also a rejection of the commitment to maintain high employment. This new policy stance was repeatedly reaffirmed even though actual monetary targets were missed and was made credible by the refusal of the government to react to the deepening recession as previous governments would have.

The fiscal policy that resulted from PSBR targeting was unambiguously restrictive. Buiter and Miller show in detail how successive targets for the PSBR became increasingly restrictive as the deepening recession enlarged actual budget deficits. In these circumstances, the targets forced discretionary actions that tightened fiscal policy to counteract the cyclical increases in the deficit. Remarkably, actual budgets moved toward surplus by 1.8 percent of GDP between 1978–79 and 1982–83, despite the deepening recession. The cyclically adjusted budget change, an indicator of fiscal stance, moved toward surplus by a huge 7.4 percent of GDP between these years. Thus by adhering to PSBR targets the government not only made credible its restrictive intentions, but also produced a severe tightening of fiscal policy.

The authors contrast this highly restrictive fiscal policy in the United Kingdom with the highly expansionary fiscal policy now in effect in the United States. They observe further that the large U.S. tax cuts contrast with increases in the tax burden in the United Kingdom. Although marginal direct tax rates have been sharply lowered for the wealthy, they have risen for many other taxpayers in the United Kingdom. Taking all taxes into account, the authors demonstrate that the marginal tax rate rose from 54.6 percent to 57.5 percent of gross income between 1978 and 1983 for an employee with average earnings. On the expenditure side of the budget, largely because of the cyclical increases in unemployment compensation and the industrial support and borrowing by nationalized industries, spending has persistently exceeded budget projections, increasing from 41 percent of GDP in 1978–79 to 44 percent of GDP in 1982–83.

Buiter and Miller look closely at the employment, output, and price developments of the Thatcher period to assess whether traditional economic relations may have changed under the new policy regime. For the past four years, 1980–83, the unemployment rate has averaged more than 5 percentage points above its 1979 level, a cumulative increase of 20 point-years, and inflation has slowed by 8.8 percentage points. The authors' effort to determine whether this outcome reflects any change in the relation between inflation and unemployment is frustrated by the absence of any agreed-upon model describing historical experience in the United Kingdom. They do show that this outcome represents a much greater rise in unemployment than had been anticipated by those officials and economists in the United Kingdom who believed the credibility of Thatcher's anti-inflation regime would slow inflation with little real cost

in output and employment. They also note that the experienced change in inflation relative to unemployment is close to predictions based on the U.S. economy.

Some observers of the United Kingdom argue that inflation has not slowed more promptly because the natural rate of unemployment has risen. According to their reasoning, it is the excess of unemployment over its natural rate that is associated with diminishing inflation, and they argue that this excess has not been great, even at the unemployment rate of 12½ percent experienced in 1983. If true, this would also imply that there is much less scope for expansion in the economy than is indicated by the observed unemployment rate and the GDP gap that goes with it. Buiter and Miller look at developments in several areas that might signal a change in the natural unemployment rate. Union membership and industrial disputes have declined in the United Kingdom, pointing to reduced trade union power since 1979. There have been only modest changes in the wage gap—a concept developed by Jeffrey Sachs (*BPEA, 1:1983*)—indicating employment growth was not restrained by excessive increases in real wages. Furthermore, the income-replacement ratio for the unemployed has not risen since the mid-1960s, suggesting that work disincentive effects have not grown. The authors conclude that there is no evidence of changes that would lead to a rise in the natural unemployment rate.

The most intriguing development addressed by Buiter and Miller is the rise in labor productivity in manufacturing. After slumping in 1980, productivity rose 4.9 percent in 1981 and 3.9 percent in 1982, and was up sharply in the first quarter of 1983. The authors cannot distinguish among three potential sources of this improvement. First, the expectation by the end of 1980 that this was not to be a typical, brief recession led businesses to lay off workers they would otherwise have kept on the payroll. Second, as the recession deepened, existing plants and machinery were shut down, with the least efficient facilities scrapped first and the more efficient capital surviving. Third, the deep recession and the specific legislation of the Thatcher regime restricting union power led to more efficient work practices. The extent to which each of these developments contributed to the good productivity record will not be clear for some time. But it was widely believed that there was great scope for improved work practices in industry in the United Kingdom, and it is thus likely that the observed productivity gains partly reflect

such improvements. Productivity gains coming from the first two sources would mainly reflect the adjustments made by business to the severity of the recession. By contrast, improving work practices and management efficiency would provide productivity gains that, if not reversed when economic conditions improve, would provide long-term benefits to the economy.

Buiter and Miller consider the major achievements of the government to be the reduction of inflation and the significant weakening of labor's power to achieve excessive real wage increases and to resist more efficient work practices. The authors see no evidence of changes in private sector behavior that would lead to wage and price declines and thus produce a sustained expansion in the face of continued restrictive policies. They believe a sustained recovery is possible without reigniting inflation; but more expansionary fiscal policies are required than are now anticipated. Without such a policy shift, Buiter and Miller fear "any potential renaissance in productivity will either merely add to the dole queue or fail to materialize for lack of investment."

A PERSUASIVE EXPLANATION of the slowdown in U.S. productivity growth continues to elude economists. Numerous sophisticated attempts to analyze it have yielded partial explanations and important insights while still leaving a substantial puzzle. Thus plausible models show that demographic changes and changes in the sectoral mix of total output have had noticeable effects on aggregate productivity at various times in the past twenty years, but much of the recent aggregate slowdown remains unexplained. Similarly, using accepted models of production, capital formation can account for only a small part of the observed variation in productivity growth. The huge increase in relative energy prices in 1974 and again in 1979–80 provides an explanation that fits the timing of the productivity slowdown of the late 1970s and is well grounded in production theory; but it is hard to establish its quantitative importance for aggregate productivity. Martin Neil Baily has attempted to account for capital obsolescence (*BPEA, 1:1981*), a phenomenon that might be due in part to higher energy prices and that might account for a much larger effect on productivity from capital shortfalls than do conventional production models. But the importance of capital obsolescence for productivity is difficult to assess because it is not directly measurable. In the second article of this issue Thomas E. Weisskopf, Samuel Bowles,

and David M. Gordon develop a "social" model of aggregate productivity growth embodying the distinctive hypothesis that social and economic forces influence the attitudes of workers and businessmen. Specifically, the model emphasizes two other potentially important determinants of productivity that defy direct measurement: work intensity and business innovation.

According to the authors, slowdowns in productivity growth can be identified after the mid-1960s and again after 1973. They point to several indicators of technical innovation and its application by business that suggest a slowdown in business innovation corresponding roughly with these productivity movements: the annual growth rate of patent applications filed for inventions declined steadily in successive five-year intervals starting with the mid-1950s; expenditures on research and development slowed after 1966 and again after 1973; and since the mid-1960s a higher percentage of corporate funds has gone into increases in financial assets than into real investment compared with earlier years. Similarly, the authors point to a range of developments in the labor market that they believe are related to attitudinal determinants of productivity. Strike activity and the incidence of industrial accidents—which they regard as an indicator and a cause of worker unrest, respectively—both declined during the postwar years through the mid-1960s, while real spendable hourly earnings—which they consider a source of worker motivation—rose by more than 2 percent a year. All these trends worsened in the 1966–73 period, with real earnings growth slowing to 1 percent a year and the industrial accident rate and strike activity both increasing. After 1973 the percentage of wildcat strikes and strikes over working conditions rose despite average unemployment rates that were much higher than in earlier periods, and real earnings growth slowed further.

To examine their hypothesis more formally, Weisskopf, Bowles, and Gordon require continuously observable variables that can be tested for their ability to explain productivity changes. They reason that the level of work intensity, which cannot be measured directly, is determined by the intensity of supervision and the probability and cost of job loss. They then model these determinants as functions of variables for which data are available, such as the duration of unemployment, the proportion of supervisory workers, the change in the growth of real spendable earnings, the industrial accident rate, and the income-replacing benefits available

to the unemployed. The authors reason that business failures are a key sign of innovative activity, with failures high when innovation is intense; and they develop a cyclically corrected measure of business failures as an index of the intensity of innovative pressure. Each of the proxy variables for work intensity and business innovation is motivated by a reasoned discussion of its place in the model. Nonetheless, many of them are conventional variables whose place in a time-series analysis could be given a different interpretation—a kind of ambiguity that inevitably characterizes econometric work and makes testing for alternative hypotheses about the underlying model difficult.

Armed with their proxies for work intensity and innovative pressures on business, the authors specify a model of productivity growth that combines these "social factors" with more conventional technical determinants of productivity including capital and the degree of capital utilization, and the price of external inputs such as energy. The resulting model tracks the actual course of output per production-worker hour in the nonfarm business sector quite well for 1948–79. The addition of the social factors roughly doubles the explanatory power of the model using technical determinants of productivity alone.

Weisskopf, Bowles, and Gordon estimate that output per production-worker hour in the U.S. nonfarm business sector rose at an average rate of 2.9 percent a year in 1948–66, 2.2 percent a year in 1966–73, and 0.9 percent a year in 1973–79. They use their model to account for the productivity slowdowns over these successive intervals. Based on the model estimated for 1948–73, they calculate that declining work intensity accounted for over 80 percent of the observed slowdown in productivity between the 1948–66 and 1966–73 periods. They confirm the verdict given by Barry Bosworth (*BPEA, 2:1982*) that slower capital formation had nothing to do with the productivity slowdown in that period.

The authors' analysis of the productivity slowdown after 1973 is somewhat different. Using their model estimated for 1948–79, they again find that declining work intensity was an important factor, accounting for 0.6 percentage point of the 2.0 points of slowdown in productivity growth observed. However, over this interval they estimate that other determinants of productivity growth also played a role; declining utilization accounted for 0.3 point of slowdown, the declining ratio of utilized capital to labor for 0.5 point, the rising relative price of raw materials for 0.4 point, and slowing business innovation for 0.3 point. Together the

social and technical factors in the model fully account for the 2 percentage points of slowdown in productivity observed between 1948–66 and 1973–79.

The formal discussants of the paper were receptive to the idea that social factors may be important determinants of productivity. But they were unconvinced that the authors had successfully modeled variations in work intensity or innovations or had identified the economic variables that influence them. The basic difficulty, alluded to above, is that the variables used by the authors could be given different interpretations than those assigned them in the social model. Because it is so difficult to make these identifications in aggregate time-series analysis, several participants at the meeting suggested that cross-industry or cross-country comparisons might be necessary to examine the social model more persuasively.

Weisskopf, Bowles, and Gordon observe that their analysis does not lead to any unique policy recommendations. They cite several distinct policy approaches that have been suggested and that might be expected to affect work intensity and business innovation: conservatives argue for weakening unions and intensifying labor market discipline while reducing government regulation; neo-liberals propose tripartite contracts among business, labor, and government, with planning agencies patterned after Japanese institutions; progressives and leftists advocate increasing worker motivation through rapid wage growth and more participation by workers in business decisions. The choice among policy proposals such as these involves fundamental social preferences and political priorities, and the authors acknowledge that their analysis offers no basis for choosing among them or for judging their likely effectiveness and side effects. But they believe they have established the role of their attitudinal variables in explaining the productivity slowdown and argue that future policy discussions should recognize their significance and should not exaggerate the importance of conventional technical determinants of productivity such as capital formation.

THE TAXATION of business income has been changed repeatedly in the past thirty years and is a topic of continuing interest to economists and policymakers. The Economic Recovery Act of 1981 and the Tax Equity and Fiscal Responsibility Act of 1982 are the most recent of such changes.

In the third article of this issue Alan J. Auerbach documents the history of the corporate tax since 1953 and analyzes the way in which legislative changes and inflation have affected tax rates on corporate capital, the importance of corporate taxes in total revenues, and the effects of the tax on incentives for investment.

Auerbach begins by pointing out the decline in the importance of the corporate tax as a source of revenue. Given the widespread concern about inflation increasing the effective tax rate on corporate capital and the relatively modest decline in the statutory rate that has occurred, this finding is somewhat surprising. The corporate tax provided about 28 percent of federal revenues in the early 1950s and generates less than 10 percent of revenues today. As a percent of GNP, corporate tax revenues declined from 5.4 percent in 1953 to less than 2 percent today. This contrasts with the personal income tax, which has remained a roughly constant fraction of federal revenues and of GNP over this period. Much of the relative decline in corporate tax revenues simply reflects the decrease in economic profits as a share of GNP; for a large part of the period the average corporate tax rate fluctuated with inflation and legislative changes, but had no trend. However, the liberalization of depreciation allowances and other investment incentives in the 1981 and 1982 tax acts reduced the average tax on economic profits from over 45 percent in 1980 to less than 37 percent in 1982, with a comparable decline in taxes relative to corporate tax flow. Thus over the entire period legislative changes account for an important part of the relative decline in corporate tax receipts.

Even though average tax rates on economic profits reflect, in addition to statutory rates, the effects of accelerated depreciation, tax credits, and other features of the tax law, they still provide only a crude measure of the impact of the corporate tax on incentives to invest in new equipment or structures. Auerbach identifies a number of reasons why the marginal tax rate relevant to new investments is not measured well by the average rate: average tax rates reflect the taxes on the return to entrepreneural skill or market power in addition to returns on physical assets; they reflect the earnings on old capital that has already been fully depreciated or whose tax depreciation is less than that on new capital; the effective tax rate on new capital reflects any anticipated changes in the tax law as well as the current law; because of the differential treatment of profits and losses, the marginal tax rate on new investment depends crucially

on the profits or losses from existing operations; and neither marginal nor average rates allow for the risk on the real value of depreciation.

Auerbach sets out to provide a summary measure of taxation that enables him to compare the taxation of different assets and to examine the variation of taxation over time. For this purpose he calculates the simple tax rate on economic income that would give the same Hall-Jorgenson user cost as the actual tax law prescribes. The tax rate calculated in this way is the effective marginal tax rate that would provide the same incentive to invest, for a given required real rate of return, as the actual depreciation allowances, investment tax credits, and statutory tax rate. According to Auerbach's calculations, the tax incentives for investment were stronger throughout the 1970s than they had been in the 1950s and early 1960s. Over the entire 1953–80 period the effective tax rate declined by more than 50 percent as a result of the liberalization of depreciation allowances and the introduction of the investment tax credit. The calculations also dramatically demonstrate the growing differential in the tax treatment of equipment and structures. Whereas the effective rate on structures remained around 50 percent until the tax acts of the 1980s, the effective tax rate on equipment declined from about 60 percent in the 1950s to about 20 percent by 1980. The tax act of 1981 actually created a negative tax on equipment; tax incentives were so great in 1981 that the before-tax rate of return could actually have been less than the after-tax rate of return experienced by investors.

Variations in the effective tax rates among assets of different types distort the incentives for investment, both within and across industries. Auerbach calculates the effective tax rates for thirty-three different types of assets and forty-four industries and finds that variations in effective tax rates are very large. In 1982, for example, he finds that rates varied by industry from a high of 39 percent to a low of 6 percent. To provide an indication of the efficiency losses that may be caused by these tax distortions to investment incentives, Auerbach derives an analytic expression relating the variance in before-tax rates of return to the amount of capital required to produce a specified vector of outputs, assuming a unitary elasticity of substitution among different types of capital. He finds the amount of wasted capital due to the uneven incentives provided by the tax system was quite low until 1971, never exceeding 1½ percent of the capital stock. During the next decade, on average, about 3 percent of the capital stock was wasted in this sense.

Thus even though effective tax rates have generally declined, the estimated loss from tax distortions has not, presumably reflecting the fact that the variation in effective rates has not diminished with the level of the rates themselves.

A salient feature of the tax law is that it treats profits and losses differently. The government does not share in losses unless they are offset against profits, although losses can be carried back three years and, since 1981, forward for fifteen years. This feature of the law not only tends to penalize risky investments, but also makes the effective marginal tax rate on an incremental investment sensitive to the profit history of the firm. For example, a firm with a significant loss carry-forward will effectively avoid the tax on a profitable new investment. To provide a quantitative measure of the importance of this feature of the law, Auerbach uses data on firms to estimate the evolution of tax-loss carry-forwards. He finds that, on average, a firm has available past profits equal to 23 percent of its capital stock against which it could carry back current losses. Although a firm typically has profits against which current losses can be offset, there is a 30 percent probability that the firm will instead find itself with past losses. In this situation, the firm can write off current profits against past losses, but it has no way to write off current losses. One way to summarize the distribution of carry-forwards and carry-backs available is that a tax obligation accrued in a given year will, on average, be paid slightly more than a year later.

The possibility of deferred payments significantly raises the effective tax rate for general industrial equipment and lowers the rate on structures. In the case of equipment, the increase in the effective tax rate reflects the fact that large deductions accrue early in the life of the investment; deferral of payments postpones receipt of that tax benefit. In the case of structures, deferral postpones paying a tax obligation.

The questions discussed thus far depend only on characteristics of the corporate tax itself. To understand the tax wedge between the return to household savings and the return to corporate capital, however, it is essential to consider the combined effect of the corporate and personal income taxes. Similarly, the two taxes must be considered together to understand both the effect of debt finance on the cost of capital in general and the way in which increases in the nominal interest rate that are associated with inflation affect incentives in particular. Auerbach calculates an effective tax rate for the combined taxes with the same method

he used to calculate the effective corporate tax alone. The overall rate depends, in addition to the factors involved in the corporate tax rate, on the debt-equity ratio, the accrual equivalent tax on capital gains, and the personal income tax rate on interest income. A personal tax rate of 0.4 and a debt-asset ratio of 0.25, for example, would make the effective overall tax rate roughly the same as the corporate rate alone. For lower personal tax rates or higher debt-asset ratios, both of which are probably more appropriate assumptions, the overall effective rate is lower than the effective corporate rate alone. Not surprisingly, the overall tax rate tends to be less sensitive to the rate of inflation except at very high personal tax rates. Indeed, for a debt-asset ratio of 0.5, inflation has essentially no effect on the overall tax rate on structures.

Auerbach observes that, given the low level of corporate tax revenues at present, abolition of the corporate tax might appear attractive as a way to alleviate some of the distortions caused by the current tax system. He notes, however, that abolition would be a "singularly ineffective way of stimulating investment because it would reduce average tax rates much more than marginal tax rates." He suggests that there are a number of straightforward methods to decrease distortions while avoiding large wealth transfers to current owners of capital.

BRAZIL'S ECONOMIC GROWTH between the two oil-price shocks of 1973 and 1979 was outstanding and, despite inflation and increasing indebtedness, has generally been regarded as a success story. After 1979, however, economic performance in Brazil and in the rest of the world dramatically deteriorated. During 1982, Brazil's foreign debt burden became a serious barrier to its own expansion and a risk to the world's financial system. In the first report of this issue Carlos F. Diaz-Alejandro analyzes both the emergence of the present Brazilian debt problem and the prospects for dealing with it.

Growth in a rapidly developing country such as Brazil usually requires large amounts of foreign financing. In Brazil's case, the external debt, defined as gross medium- and long-term public and publicly guaranteed debt, rose by an average 26 percent a year between 1973 and 1979. Many observers now blame the new Brazilian government's decision in 1979 to continue expansionary policies for the country's current crisis. With hindsight, knowing what happened to the world economy, it would undoubtedly have been preferable for the government to pursue a more

conservative policy. But it is not clear how prescient a policymaker would have had to be to avoid a crisis, or indeed whether it would have been possible at all. To illuminate the extent to which prudent planning would have mitigated the current crisis, Diaz compares actual developments with those that a hypothetical prudent planner might have projected and used as a basis for policymaking. Diaz calls the difference between actual developments and the prudent planner's projections "surprises." These reflect, first, the discrepancies between actual world economic conditions and conditions that Diaz believes would have been assumed by prudent policymakers in 1979 and, second, the differences between actual and "prudent" policies in Brazil itself.

Diaz argues that a prudent planner would have allowed external debt to grow at a rate roughly equal to the expected dollar interest rate for Brazil during the period. Hence, in the prudent projections, external debt grows 12½ percent a year, which happens to be roughly half the rate of the preceding period and roughly half the actual rate of growth experienced during 1981 and 1982. By the end of 1982 the actual level of net debt exceeded the prudent projection by approximately $17 billion. This adverse "surprise" can be decomposed into three proximate causes: "surprises" in the current account deficits, in net direct foreign investment, and in net interest payments. Actual imports were $6.6 billion greater than the prudent planner's projection in 1980, presumably the result of the rapid actual expansion of the Brazilian economy that could have been at least partially restrained by prudent policy. After 1980, policy shifted to slow the expansion, and this move sharply curtailed imports and made the import surprise favorable by 1982. Exports collapsed with the world recession and with the growing foreign debt problems of other less-industrial nations that had become important markets for the Brazilian economy. Over the three-year period, surprises in the current account as a whole amounted to $5 billion, accounting for less than a third of the total debt surprise. It is difficult to attribute much of that effect to imprudent policy. The surprise in net direct foreign investment amounted to $2.6 billion in 1980–82. Diaz believes the most plausible explanation for this shortfall of investment relative to the prudent projection is the deterioration in profit expectations that came with adverse macroeconomic conditions, both inside and outside Brazil.

Interest payments are by far the largest component of the adverse debt surprise, amounting to $9.7 billion over the three-year period. Part

of this surprise reflects the increase in net borrowing that corresponds to the deterioration in the balance of payments itself. But according to Diaz's calculations, more than two-thirds of the increase above the projection results because interest rates were higher than could have been reasonably anticipated. Indeed, he estimates that approximately 40 percent of the entire debt surprise over the period can be traced directly to the interest rate surprise. Diaz concludes that, although Brazilian authorities followed a risky strategy for 1980, which they began to correct in 1981, no plausible amount of prudence during 1980–81 could have sheltered Brazil from the consequences of the violent shocks to the world economy that have occurred in the past few years.

Diaz emphasizes that a Brazilian stabilization program "can only be decided by Brazilians" if it is to be politically and economically viable. He does suggest broad agreement among economists that such a program will have to include a sharp real depreciation of the exchange rate which, in turn, will require revision of wage and price indexing within Brazil to permit a reduction of real wages. But he is critical of attempts by lenders and the International Monetary Fund to impose highly restrictive budgetary and monetary policies on Brazil. Diaz argues that the relation between such policies and the balance-of-payments problem is weak and uncertain; yet those policies threaten to deepen the Brazilian depression that is already worse, by most measures, than that of the early 1930s. The appropriate role of the International Monetary Fund and the kinds of targets it should set for a country in Brazil's position generated a spirited debate at the meeting, which is summarized at the end of the paper.

RECENT HISTORY records an extraordinary combination of economic developments. Both real and nominal interest rates reached record highs. Inflation peaked at very high levels in 1980 and receded only in the course of the worst recession in output and employment in the postwar period. In the second report of this issue, Richard H. Clarida and Benjamin M. Friedman examine this experience, focusing on the question of whether, given the behavior of other economic variables, the level of interest rates has been surprisingly high.

To answer this question the authors make use of a small econometric model previously estimated through 1976:2 and reported by Friedman

(*BPEA, 2:1977*). The model performs quite well for almost all variables during the three years following the original estimation period and correctly forecasts the general upward trend in short-term rates, with an average overprediction of only 0.3 percentage point for the period. By contrast, when the model is reestimated through 1979:3 and used to forecast the 1979:4–1983:2 quarters, it does not perform well. For this period, the model makes large errors in individual quarters, although it underpredicts short-term interest rates by an average of only 0.7 percentage point. What is more damaging, as the authors point out, to the extent that its average errors are still modest, the model is "right for the wrong reasons." They show that there are large errors in predicting inflation, money growth, and the yield spread between long- and short-term interest rates and that short rates are predicted as well as they are only because these errors in the other equations of the model largely offset each other in the model's prediction of short-term rates.

This deterioration in forecast performance suggests that the behavioral relations underlying the model changed after 1979. The authors test formally for structural change and find that each of their five estimated equations shows a statistically significant change in slope parameters, even after allowing for a shift in intercept. In view of the announced change in the monetary policy regime in October 1979, the shift in the money supply equation is relatively easily explained. But the shifts in other equations are more puzzling. For example, the apparent shift in aggregate supply behavior reported by the authors is in the opposite direction from that expected by those who believe that the announced commitment to a disinflationary monetary policy would lead to an especially rapid deceleration of inflation.

The authors conclude that "price inflation was faster and nominal money growth slower than would have been expected on the basis of previous historical experience. . . . The interaction of the two would be expected to raise the level of short-term interest rates, not just in this model but in any familiar representation of interest rate determination."

THE SEVERE RECESSION of 1980–82 resulted from a monetary policy that sought to slow inflation and succeeded. The last two reports in the current issue, one by George L. Perry and one by Phillip Cagan and William Fellner, examine this episode to determine what it reveals about

the inflationary process and, specifically, about whether a monetary policy that credibly promises disinflation can favorably alter that process.

In his report, Perry outlines the predictions that were implied for this disinflationary episode by alternative models of the inflation process. According to the wage norm model reported by Perry in *BPEA, 1:1980,* persistent disinflationary policy would initially achieve only the typical cyclical slowdown in inflation; but as the policy imposed unusually great or sustained weakness in the economy, inflation would slow by more than this as the wage norm shifted downward. Such an eventual shift would show up as forecast errors, indicating a downward shift in the constant term in a wage norm equation. Alternative models, in which adaptive expectations take the place of norm shifts, capture those expectations by using many lagged values of past inflation in equations predicting current inflation. In such models, a persistent disinflationary policy is not expected to alter the constant term or the coefficients of the equation or, therefore, to produce systematic forecast errors. In a still different class of models that stresses the importance of policy objectives, including new classical models with rational expectations, price expectations are based on expectations of future policy. Although these models have not been estimated and thus their forecasts cannot be evaluated directly, they have implications for the forecasts from other models. They predict that inflation forecasts from a wage norm model would be too high once the credibility of policy was established; it would not be necessary to wait until the wage norm dropped as a result of experienced hard times. Similarly, these rational expectations models predict that adaptive expectations models would forecast more inflation than that which actually occurred because adaptive expectations make no allowance for special effects from credible policies.

To test these alternative predictions, Perry first uses the wage norm equation from his earlier article, estimated through 1980:1, to forecast wage inflation through 1983:2. He finds the first evidence of wages rising more slowly than predicted in 1982:4, three full years after the new monetary policy regime was instituted, by which time the unemployment rate had risen 4½ percentage points. Only in 1983:2, the last quarter of Perry's analysis, does the slowdown in wage inflation relative to the cyclical forecast of the model appear to be large and significant. Thus he finds no evidence that the new policy regime produced faster or less

costly disinflation than the wage norm model anticipated. Perry finds support for this verdict in other evidence on recent performance. He shows that union wage settlements were exceptionally weak during 1982 and the first half of 1983; these extraordinary developments have occurred in industries confronted with extreme economic hardship. Although wage weakness in these industries has contributed to slowing the wage average analyzed with his aggregate wage equation, the exceptional weakness has not been as widespread as one would expect if it was the result of unusual expectations about macroeconomic policy. Perry also shows that price forecasts from the equations for the fixed-weight GNP deflator presented in a previous paper by Gordon and King (*BPEA, 1:1982*) show no evidence of overpredicting inflation in the recent period through 1983:2. The Gordon-King price equations employ adaptive expectations, so that these findings are not inconsistent with the evidence of a downward shift in the wage norm. But they reject any special effects from policy announcements or from policy credibility more generally.

In their report, Cagan and Fellner employ a wage model that is similar but not identical to Perry's and analyze its performance in a somewhat different way. In 1980:2–1981:1, the first four quarters outside the sample period used in estimating their equation, actual wage increases average somewhat more than their equation predicts. By 1981:4 the equation starts overpredicting wage increases by amounts that are modest at first, averaging 0.5 point in the first four quarters, but that become substantial in 1982:4 and especially in 1983:2. The general pattern of forecast errors is the same as Perry found with his equation, although the average overprediction over the entire postsample forecast is somewhat larger. When Cagan and Fellner reestimate their equation though 1983:2, a dummy variable for 1981:4–1983:2 shows that wage inflation, on average, slowed by an additional percentage point over this period.

Cagan and Fellner tentatively conclude that wage inflation was favorably affected by the policy environment of the period, with the credibility of the disinflationary policy playing an important role. On the question of what it takes to achieve credibility, they remark, "Whether credibility is affected by announcements as well as perceived changes in policy actions may be debated, but recent experience points to the importance of policy performance." On this question Perry observes, "if expectations are simply formed by actual experience, there is no

useful distinction between the wage norm and credibility hypotheses in their predictions for the present period of disinflation. Both would then require an extended period of low actual inflation, brought about by an extended depression in economic conditions, in order to shift wage inflation downward by more than just the predicted cyclical response.'' But Perry is optimistic about the effects of the shift downward in wage norms that finally occurred, noting that the improvement in inflation represented by the norm shift will not automatically be reversed if the economy now returns to the high employment levels of the late 1970s.