Editors' Summary

THIS ISSUE of *Brookings Papers on Economic Activity* contains papers and discussions presented at the forty-ninth conference of the Brookings Panel on Economic Activity, which was held in Washington, D.C., on April 5 and 6, 1990. The first major paper evaluates the implications of the aging of the American population for optimal national saving. The second paper analyzes Eastern Europe's move to develop national market economies. The third paper takes a fresh look at the transmission mechanism, by which monetary policy affects aggregate demand. The first report returns to the unsettled issue of the relationship between the level of inflation and uncertainty about its future course. The second report analyzes changes in corporate leverage. The final report assesses the prospects for economic reform in the Soviet Union.

THE DRAMATIC reduction in the U.S. birthrate in recent years makes it almost inevitable that the American population will age rapidly over the next 50 years. According to official estimates, by the year 2025 the share of the American population 65 or over will exceed the fraction of Florida's population that is of retirement age today. These demographic prospects have aroused considerable anxiety in the United States about the increased burden that a growing elderly population will place on the economy. That anxiety was a driving force behind the social security legislation enacted in 1983 calling for accumulation of a substantial surplus in the social security trust fund during the next 30 years, to be drawn down as the population ages. In the first paper of this issue, David M. Cutler, James M. Poterba, Louise M. Sheiner, and Lawrence H. Summers assess the coming change in the dependency burden and its implication for productivity growth, the optimal level of saving, and the appropriate response of fiscal policy.

The most obvious way demographic shifts affect the economy's consumption opportunities is by changing the relative sizes of the self-sup-

porting and dependent populations. The authors summarize the effects of these changes using the "support ratio," which they define as the effective labor force divided by the effective number of consumers. Hence the support ratio reflects the consumption needs of people at different ages, labor force participation rates, and the earning power of those that are working. Because of the range of possible assumptions about these factors, the authors report empirical estimates for several different measures of the support ratio. The measures all make the same basic points. The dramatic decline in fertility rates, from the postwar high of 3.6 in 1947 to approximately 2 today and in the projected future, is the principal source of change in dependency, but the effects are not uniform over time. A decrease in fertility first reduces dependency by reducing the number of children relative to workers and only later increases dependency by reducing the number of workers relative to the number of retirees. Labor force growth weighted by earnings is now slowing and, in the first decade of the next century, is projected to be only one-fourth its rate during the 1970s. Nevertheless, economic dependency is projected to fall in the next two decades because the declining number of children more than offsets the rising number of dependent elderly.

Over the longer run, both because of changes in labor force participation and because of increased life expectancy, the labor force is expected to grow more slowly than the population. The authors calculate that the earnings-weighted labor force, which grew at a 1.7 percent annual rate during the 1980s, will actually shrink in four of the five decades between 2010 and 2060. When consumption needs are assumed to be equal for individuals of all ages, the support ratio declines by between 7 percent and 8 percent from 1990 to 2060. When consumption needs are assumed to be age-dependent, the ratio declines by more than 11 percent. Although the decline may seem large, the authors note that it is, if anything, less than the increase realized during the past 30 years; over 70 years, the decline is equivalent to only a 0.10–0.15 percentage point reduction in annual productivity growth. On the other hand, it exceeds estimates of the peace dividend the United States is likely to enjoy over the next decade by a factor of three or four.

The authors stress the substantial uncertainty inherent in demographic projections. The range of historical experience dwarfs the range between the Social Security Administration's optimistic and pessimistic projections. Possible changes in the future course of immigration add to

the uncertainty, as does the difficulty of predicting future growth in life expectancy, labor force participation, and retirement age. For example, a three- or four-year increase in retirement age would offset the predicted decline in the support ratio, while a comparable decline would double it. By contrast, the predicted improvement in the support ratio during the next two decades is much more certain because, to a substantial degree, it rests on the actual fertility experience of the last two decades.

At the same time that the decrease in fertility leads to an eventual decrease in the support ratio, with a corresponding deterioration in consumption possibilities, the authors note that it has a less obvious effect that improves them. A decrease in the growth of the labor force reduces the saving required to maintain any given capital-output ratio and hence gives society a consumption dividend. The authors estimate that the consumption dividend from decreased capital requirements is substantial. With an unchanged capital-labor ratio, it offsets between one-fourth and one-half of the increased dependency by the middle of the next century. During the next 20 years, changes in dependency and labor force growth work in the same direction, and consumption possibilities actually improve by between 3.4 percent and 6.3 percent. The authors stress that, in making these and the related projections, they are not asking whether the actual level of saving is too high or too low, but whether the changes in demographics themselves make a case for higher or lower saving.

How should the United States respond to the possibility of increasing consumption in the short run while maintaining the level of capital intensity, when the long-run prospect is a reduction in the sustainable level of consumption? The authors make use of the standard Ramsey optimal growth model to answer this question, asking how a social planner would adjust current and future consumption in response to the changing demographics. With a social welfare function that weights the utility of per capita consumption in each time period by the population, the optimal steady-state capital intensity is independent, not only of the support ratio, but of the rate of growth of the population itself. The increased cost of adding to the capital stock with higher population growth is just balanced by the increase in the number of individuals who would benefit from it. Hence, in the long run the effects on optimal consumption are just those that have already been discussed: consumption will fall as the reduced

saving needs from slower labor force growth will only partially offset the increase in dependency.

The dynamics of optimal consumption and saving during the transition to steady state are more complicated, since the support ratio and rate of population growth do not jump immediately to their long-run values. The authors calculate the optimal path, assuming that the economy is in steady state in 1990 and that the changes in demographics over the coming seven decades suddenly become known in that year. For a range of assumptions about the elasticities of substitution in consumption and production, they find that optimal consumption remains above its 1990 level until 2020 or later. With an earnings-weighted labor force and needs-weighted consumption, this initial increase is approximately 2 percent. Consumption then continues to increase for about 10 years and then gradually falls over the next 50 years to its new steady state. The saving rate, after regaining part of its initial decline by the year 2000, declines steadily over the following 30 years. The authors conclude that for all plausible combinations of parameter values, the optimal short-run response to the changed demographics is to increase consumption; the effects of reduced labor force growth and the reduction in the number of children exceed the effects of anticipating the eventual increases in dependency.

The authors also explore how the consumption path would have been different if they had begun their experiment in 1970 or 1980 rather than in 1990. In these simulations the time paths of consumption and saving are essentially the same as the path beginning in 1990; they simply start earlier. In all cases the saving rate is lower in the 1990s than in the original steady state and begins a period of prolonged decline by the year 2000. The authors note, however, that the actual decline in the saving rate in the United States from the 1970s to the 1980s is considerably larger than the optimal response to the demographic changes can justify.

The authors show that the European Community and Japan will also experience demographic changes that will increase dependency there during the next 60 years and eventually lead to reductions in consumption. In Japan, the increase in dependency is driven more by reductions in mortality than by a decrease in fertility, so that the consumption dividend from slower labor force growth is much smaller. The projected long-run decline in consumption is therefore much larger for Japan than it is for the others, exceeding 15 percent in the authors' simulations.

In a world of capital mobility, U.S. consumption and saving should

depend on world as well as U.S. demographics. The authors construct and simulate a two-country version of their model, taking the United States as one country and the rest of the OECD as the other. Because the United States is aging more slowly than other OECD nations, for the next 15 years in the United States the optimal adjustment, given the possibility of borrowing abroad, involves higher initial consumption and a substantial current account deficit: the percentage of U.S. assets that are foreign owned increases more than 6 percentage points by the year 2010.

In the analysis described thus far, the rate of technical change has been assumed to be independent of demographic developments. But if changes in population growth or the age composition of the population make even a small change in the rate of technical progress, the change in productivity may well dominate the results. Unfortunately, theory does not provide an unambiguous prediction of the sign of such an effect. Some have argued that the lower rate of net investment, or other variables related to the growth in the labor force, is likely to be a negative influence on technical progress; others have argued that slower labor force growth and labor scarcity will raise the rate of innovation. The authors attempt to shed some light on this issue by comparing productivity in a variety of countries, using the growth in labor force and investment rate as explanatory variables. They find that for a variety of specifications, the growth of labor force tends to be negatively related to the growth in productivity. The authors attach considerable uncertainty to these results, noting that a variety of other factors may be at work. However, taken at face value, their results imply large effects, with the slowdown in labor force growth leading to more than a 0.5 percent increase in the rate of productivity growth. That increase is more than enough to offset the effects of the predicted rise in the dependency rate on future consumption possibilities.

Having concluded that, other things being equal, recent and projected demographic changes warrant a decline in the national saving rate, the authors examine two possible reasons why government saving should nonetheless increase in response to these changes, as some observers have suggested. One possibility is that the demographic changes that lower optimal national saving lead to an even greater decrease in private saving; if so, the optimal government response would be fiscal tightening. The authors show that the likely effect of the maturing of the population is a small increase in the private saving rate during the next 30 years.

Hence, if anything, the response of private saving points to a loosening of fiscal policy. A second argument for tightening fiscal policy is that the projected demographic changes imply significant fluctuations in the level of government spending over the next century, since transfers to the elderly are much larger than those to any other group. Because the deadweight loss of taxation increases with the square of the tax rate, varying taxes on a pay-as-you-go basis may be very costly relative to a constant tax rate policy that would generate surpluses in the next several years. However, even assuming that spending on the elderly is more than double spending on any other group, they find that the deviation of the pay-as-you-go tax rate from the constant rate never exceeds 3 percent of GNP. The difference in deadweight loss is extremely small, with a present value for all the losses from 1990 to 2060 of only 1.1 percent of 1990 GNP. They therefore conclude that the tax-efficiency argument for prepaying the costs of the future dependency burden is weak.

The authors conclude with a long agenda for future research on the macroeconomic implications of demographic change that might also help explain why private saving recently fell so much more than is called for by models of optimal consumption behavior. While recognizing the uncertainties that remain, they believe that their analysis correctly questions the view that lower fertility will substantially increase the burden of dependency. And they doubt that future research will alter their conclusion that slowdowns in population growth provide opportunities as well as challenges.

THE HISTORIC overthrow of communist regimes in Eastern Europe is being followed, in several countries, by active attempts to develop market economies. Poland, which started a thoroughgoing program of economic reform at the start of this year, is trying to move quickly to a full market economy from an especially desperate economic situation left by the previous communist regime. In the second paper of this issue, David Lipton and Jeffrey Sachs analyze the situation of the Eastern European economies with special emphasis on Poland and the lessons its experience provides for others attempting economic reform.

Government ownership and central planning of the economy—what Lipton and Sachs call the Stalinist legacy—have characterized the economies of Eastern Europe throughout most of the postwar period. Even during the most recent years, when attempts at reform in Hungary

and Poland reduced the sphere of central planning, market forces did not gain great importance. Relative prices are still unrealistic, with food and shelter heavily subsidized and other goods, including imported goods, severely rationed. Production is overly concentrated in heavy industry and capital goods to the detriment of light industry, services, and consumer goods. Furthermore, industry is organized in a way that facilitates central planning, rather than market competition, with production concentrated in a few large firms and very few small- to medium-size firms in existence. There are no mechanisms for sensibly either starting or dismantling enterprises. And, in varying degrees, the countries of Eastern Europe all suffer from chronic excess demand, the symptoms of which show up as shortages of basic inputs for enterprises, long queues, and a well-developed black market for consumer goods.

According to Lipton and Sachs, excess demand coupled with controlled prices for many goods and services is a source of repressed inflation that poses major problems for economic reform. They present a theoretical model of repressed inflation in which shortages reduce utility and properly measured real incomes even though officially measured real incomes may continue to rise. These declines in utility reflect the time spent queuing for goods that takes place under conditions of excess demand and controlled prices.

Lipton and Sachs outline a three-step strategy for reforming Eastern European economies that, with variations in emphasis, they see as applicable to any of them. First, use fiscal and monetary austerity to end excess demand. Second, create market competition through unregulated prices, free trade, a liberalized private sector, and an end to the monopoly power of state enterprises in many industries. Lipton and Sachs argue that these first two steps must be taken quickly and together. The necessary reallocation of resources requires establishing the proper relative prices, which, in turn, requires deregulating prices. By imposing macroeconomic austerity in conjunction with deregulation, the government can keep the large jump in the price level that will follow deregulation from leading to an ongoing inflation. The third step of reform is privatization, which the authors recognize will take some time to complete.

Anticipating a number of transitional problems in moving to free market economies, Lipton and Sachs outline how governments should be prepared to deal with them. A variety of labor market policies,

including safety nets and job retraining, will be needed to cope with the inevitable rise in unemployment. Poland and Hungary, and possibly other Eastern European nations, should renegotiate the terms on their foreign sovereign debt so as to reduce the interest burden. Because the state sector will remain significant in the economy for some time, rules for wage-setting and investment will have to be devised and employed as a substitute for market forces.

Economic integration with Western Europe, say the authors, is a key engine of growth for those Eastern European economies that have taken the steps to reform their economies. To facilitate this integration, they urge that existing trade barriers in both directions be removed and that Eastern European countries be assured of future access to Western European markets. In addition, to assure that needed foreign investment is made in Eastern Europe, investment treaties should guarantee repatriation rights on the foreign investment.

Turning to specifics, the authors focus on the situation in Poland, where a market reform program was initiated at the start of this year following a decade of subpar real growth that began with a balance of payments crisis in 1979 and ended with hyperinflation in 1989. When the Solidarity-led government took office in September 1989, they immediately committed themselves to rapid transition to a market economy, tightened the budget, weakened wage indexation, and restrained the growth of credit. In response, the parallel, or free market, exchange rate appreciated, while the government depreciated the official exchange rate, and the ratio of the parallel to the official rate fell from 7.1 in September, to 1.7 in December, to full parity in January.

The reform program that began at the start of 1990 has several parts. First, a sharp cut in subsidies and investment spending by the government will bring the budget into balance. Second, the growth of credit will be slowed, partly through a sharp increase in interest rates. Third, the currency has been made convertible, and the newly devalued exchange rate has been stabilized at the new depreciated rate. Fourth, a tax-based incomes policy will limit increases in the nominal wage in state enterprises. Fifth, prices are being liberalized, except in certain regulated sectors such as public utilities where there has been a sharp one-time price increase.

Although the program has been in effect only a short time, Lipton and Sachs find the early returns promising. The gap between the parallel and

official exchange rates has vanished. The zloty prices of traded goods have remained stable, making them an effective nominal anchor to other prices in the economy. The wage program permitted wage bills to rise only a fraction of the increase in retail prices by subjecting any increase in wages above a designated norm to confiscatory tax rates. Lipton and Sachs argue that this partial decontrol of wages was better than complete decontrol for two reasons. Complete decontrol risked setting off a wage-price spiral in a situation where prices were sure to rise; and the economy is still dominated by state enterprises that lack market discipline and have a history of giving in to large wage demands. The wage policy produced a substantial decline in the measured real wage as most prices rose sharply to clear markets. But the authors argue that the measured decline greatly overstates the actual decline in living standards because the price increases were taking place in what had been a shortage economy; consumers could not in fact freely buy the goods at the previous prices. They cite questionnaire responses showing that people felt somewhat better about their material well-being and about the overall economic situation in March of 1990 than they did in September of 1989.

The authors argue that the move to free trade, which was aided by the elimination of quotas on both imports and exports, had benefits beyond economic stabilization. Bringing competition to the economy from abroad served as a counterweight to the extreme concentration in industry; the freeing of trade provided a quick antimonopoly policy. In the longer run, they expect free trade to help bring Western technology to Poland and to ensure the steady demand growth for Polish products in the export sector.

Lipton and Sachs cite a number of other consequences from the stabilization effort to date. Enterprise managers, confronted with limited credits, have started to adjust to market realities, although their incentives are far from those experienced under private ownership and a full-fledged market economy. Inventories have been exceptionally high because enterprises had protected themselves from shortages by holding stocks that would be excessive in a market economy. With widespread shortages eliminated and with real interest rates positive, a large reduction of inventories is likely, and will depress production in the industrial sector. Unemployment has risen from less than 50,000 in January to an estimated 266,000, or 1.5 percent of the labor force, by the end of March. Managers view much of their labor force as redundant, and unemploy-

ment is expected to rise sharply in the months ahead. The authors note that the Ministry of Labor has predicted that unemployment will grow to 500,000 workers; they themselves believe it may reach 10 percent of the work force, or 1.8 million workers, as the massive reallocation of workers takes place. They note that reform has already brought some needed discipline to the labor market, with sick leave down sharply and wage pressures moderated. But they urge strengthening social safety net programs, both to see that the burden of reform is not unfairly distributed and to see that it does not undermine social consensus for change.

The pursuit of privatization is complicated by the fact that the ownership of state enterprises is already being contested politically. The authors suggest that the government establish the idea that it owns the enterprises and is in a position to sell them. Enterprises should be transformed into private corporations with transferable ownership shares; alternatives such as self-managed firms or cooperatives should be resisted because those forms of organization will have trouble raising money in the capital markets and would put workers at excessive risk.

Lipton and Sachs observe that Poland continues to be burdened by its foreign debt. The West has provided financial assistance to Poland in two forms. The balance of payments has been supported by funds from the International Monetary Fund, the Bank for International Settlements, and a $1 billion stabilization fund created by industrial country governments. Without this financial support, the Polish authorities might have been unable to introduce a convertible currency and stable exchange rate. In addition, Poland has received temporary relief from interest payments on its external debt. The authors believe that Poland must push for forgiveness from a part of its external indebtedness, as its present debt overhang makes the return on foreign investments uncertain and probably inhibits foreign investment in Poland. They also see the need to resist advice from the IMF and other sources to devalue the currency because they see the nominal exchange rate as an anchor for price stability with prices adjusting to the exchange rate.

Evaluating Poland's prospects on purely economic grounds, Lipton and Sachs see "profound reasons for optimism in the long term," believing that Poland should be able to narrow dramatically the present huge gap in living standards with Western Europe. But they warn that these prospects can be frustrated politically. They point to Latin Amer-

ican nations as an example of how an economic crisis in a politically fragile situation invites populist politics. And they see such risks in the political situation in Eastern Europe as one reason for acting rapidly and decisively in economic reforms.

ALTHOUGH there is a broad consensus within and without the economics profession that monetary policy affects aggregate demand, relatively little work has been done since the 1960s on the precise mechanisms by which it does so. Since the heyday of research on the transmission mechanism, enormous changes have taken place in the institutional and regulatory environment. Interest rate ceilings have been removed, portfolio restrictions on thrifts have been relaxed, money market substitutes for commercial bank demand deposits have grown dramatically, and new financial instruments and markets have emerged. At the same time that these innovations appear to have increased the competitiveness of financial markets and reduced the special role of commercial banks, theoretical work on the implications of asymmetric information has sharpened our understanding of how market imperfections and noncompetitive behavior in capital markets in general and loan markets in particular may affect the transmission of monetary actions to aggregate demand. In the third paper of this issue, Christina D. Romer and David H. Romer examine the transmission mechanism, attempting to assess the relative importance of the volume of bank liabilities—the money view—and the volume of bank assets—the lending view—in the transmission process.

In the authors' characterization, the two views differ in whether changes in interest rates primarily reflect the need to adjust the demand for bank deposits to the level that can be supported by reserves, as in the money view, or the need to adjust the demand for bank loans to that level, as in the lending view. Hence the authors are concerned with comparing the roles of money and loans in transmitting a reduction in reserves to tightness of financial markets, rather than in distinguishing the role of interest rate changes from the role of credit rationing in that process.

Romer and Romer see strong theoretical reasons for believing in the money rather than the lending view. They note that banks have the option of financing loans by issuing certificates of deposit and that CDs are themselves likely to be close substitutes for a variety of open market

instruments. Because reserve requirements on CDs are very low, they argue that banks' capacity to make loans is insulated from the direct effects of changes in the volume of reserves and that the terms on loans will be tied to the interest rates on CDs and their close substitutes. Consequently, the interest elasticity of loan demand has little to do with the magnitude of the increases in money market rates resulting from a decrease in reserves. Similarly, increases in loan demand can be accommodated without increases in reserves. Hence, given the existence of CDs, the connection between the quantity of reserves and the volume of bank loans might be quite loose. On the other hand, interest rate adjustments will be required to equate the demand for transactions balances to the quantity that can be supported by reserves.

The endogeneity of money, loans, interest rates, and output poses a difficult problem for any empirical investigation of the transmission mechanism. The authors attempt to deal with this problem by focusing on the behavior of money and credit during six episodes in which they believe the Federal Reserve made an exogenous shift to tighter monetary policy.

These episodes were identified in earlier work of the authors by a careful reading of the System's *Record of Policy Actions* and *Minutes* of the Federal Open Market Committee. By using the Federal Reserve's statement of intent rather than the actual behavior of policy instruments themselves, they believe they can ensure that there is no systematic factor at work other than monetary policy that might be affecting financial variables and real output.

Romer and Romer first examine the developments in the money stock and bank lending in the months following the exogenous changes in policy they have identified, computing the average departure of each variable from a naive forecast of a simple univariate equation. Both money and bank lending behave qualitatively as one would expect following a tightening of policy. Seven months after the policy shock the money stock averaged 2 percent less than the level called for in the naive forecast. Bank lending shows little change from its forecast path for the first six months, but then departs sharply, with an average shortfall of 6.3 percent at 30 months. Interest rates and interest rate spreads also behave as would be expected following a reserve contraction. The Treasury bill rate, for example, increases an average of 170 basis points from three months before to six months after a policy shift. In this

interval, the peak rate after a shift is typically 50 percent above the low rate before the shift. Most notably the spread between commercial paper and Treasury bill yields increases sharply within the first six months following each of the policy shocks; on average it more than doubles in the first three months.

That the behavior of money, bank lending, and interest rates are all consistent with monetary tightening following the shifts in policy identified from the Federal Reserve's statements of intent is reassuring, but does not distinguish between the money and lending views of the transmission mechanism. To do so, the authors estimate the normal cyclical money-output and lending-output relationships and examine the departure of money and lending from these normal relationships during the episodes they have identified as exogenous tightening. A greater than expected decline in one of these variables suggests to the authors that the variable played an important role in the transmission of monetary policy to output; a normal response suggests that its movement was merely the endogenous response to the decline in output. To estimate the normal cyclical response, separate equations for log changes in money and bank lending are estimated using lags and leads of changes in industrial production, lagged values of the dependent variable, and monthly seasonals.

Using these equations, the authors find that much of the movement in both money and lending in the focal episodes appears merely to reflect usual cyclical behavior. For example, at 18 months, the average forecast errors of lending and money are both less than 0.7 percent. At most horizons, about three-quarters of the forecast error of the naive autoregressive equation for lending and half the error for money are explained by output. However, even after taking output into account, the forecast errors for money are still largely negative; the forecast errors for lending are consistently negative in two episodes, generally negative in a third, and largely positive in the remaining two. The authors conclude that the special behavior of movements during the episodes of tightening is in money rather than in loans.

The authors try two more direct methods of assessing the importance of policy-induced changes in money and bank lending to output. In the first, they estimate output equations, with either money or bank loans as explanatory variables, and compare ordinary least squares (OLS) estimates with those obtained with an instrumental variables technique

(IV), using dummy variables corresponding to episodes of tight policy as instruments. This approach allows the authors to infer whether, as they predict, the response of output to money is stronger during the focal episodes than at other times, and whether there is a lag in the response of output, as would be expected if causation ran from money to output. The authors recognize that the interpretation of the results is not airtight, but they find them generally supportive of an independent role for money in the transmission mechanism: money leads output, and the money-output link is stronger than usual in response to independent shifts in monetary policy. They view the evidence on an independent role for lending as less persuasive; with IV estimation the effect of lending appears to be instantaneous, and the estimated effect of lending is no larger than under OLS. For both money and lending, however, the IV estimates are very imprecise, and it is difficult to reject the hypothesis that OLS and IV estimates are equal.

The second method the authors use is simply to estimate separate regressions for focal and nonfocal periods. The results are similar to those from the first method. They show that the relationship between money and output is lagged and highly significant during focal periods and insignificant otherwise; the relationship for the entire period primarily reflects behavior during periods of anti-inflationary policy. Output appears to be contemporaneous with loans rather than lagged, and the lagged coefficients are consistently of the wrong sign.

The authors' theoretical argument that bank loans are not a direct link between monetary policy and output depends on banks' ability to accommodate loan demand by issuing CDs or other liabilities having low reserve requirements. While such opportunities were available during the later episodes, the authors note that during the early episodes banks had no ready alternative source of funds to transactions balances. This leads them to look separately at the early and later episodes. While the results can only be suggestive with so few observations, they find the pattern of output responses differs in the way they expect. During the early episodes the estimated real impact of a shift in lending is consistently positive, and there is a considerable lag in the relationship. In the later episodes the estimated impact rises very quickly to a low peak and then fluctuates irregularly.

The authors conclude that the evidence is consistent with the conventional textbook account in which the Federal Reserve's influence over

the economy stems primarily from the impact of monetary policy on the stock of transactions balances. They caution that their results do not imply that bank loans do not have important distinguishing characteristics that make them imperfect substitutes for other assets. Rather, they argue that banks' access to alternative sources of funds insulates bank lending from the direct effect of monetary policy. They also stress that in a changing economy the channels of monetary transmission are unlikely to be constant over time. Indeed, they note that the removal of rate regulations in the 1980s may well have made the demand for transactions balances less responsive to the general level of rates than it was during the episodes they studied, and that in future periods of tight money, bank lending may bear a larger part of the burden of adjusting to reduced levels of reserves.

INFLATION is the nemesis of any policymaker. But although most economists agree that inflation is costly, they are at pains to point out that most of the costs would disappear if inflation were fully anticipated. It is generally presumed that an increase in inflation is costly because it raises uncertainty about inflation's future course. Yet despite numerous studies of the relation between the level of inflation and uncertainty about its future, the nature and importance of the connection remains unsettled. In the first report of this issue, Laurence Ball and Stephen G. Cecchetti revisit the question, focusing on the distinction between short-term and long-term uncertainty. They argue that much of the contradictory evidence about the relationship between the level of and uncertainty about inflation can be traced to differences in the time horizon over which uncertainty is measured. They believe that separating short-run and long-run uncertainty has other advantages as well. It helps distinguish between alternative explanations of the inflation-uncertainty relationship, allows more precise discussion of the costs of inflation, and provides the basis for more useful advice to policymakers, who are more able to influence long-run inflation than the movement of prices quarter to quarter.

Ball and Cecchetti begin with a brief survey of the existing theoretical and empirical work on the relation between the level of inflation and inflation uncertainty. Since, as a theoretical matter, it is unsatisfactory simply to assume that the distribution of "shocks" to inflation shifts with the level of inflation itself, theoretical explanations have typically

focused on reasons why higher inflation should magnify the response to shocks of a given size. Many such explanations focus on reasons why inflation should vary more around a high trend rate than a low one. For example, it has been argued that individuals adjust their cash balances more frequently at higher inflation rates, so that money demand responds more quickly to shocks, causing inflation to vary more. Analogously it has been argued that higher trend inflation reduces nominal price rigidity arising from "menu costs," so that aggregate demand shocks have smaller effects on real output and larger effects on inflation. Ball and Cecchetti suggest that if such theories capture an important phenomenon, they should detect a relation between the level of inflation and the variance of inflation over relatively short horizons.

These theories, however, do not explain why long-run inflation should vary more—that is, why there is greater uncertainty about the *trend* rate of inflation—when inflation is high. Since it is generally assumed that the monetary authority can control the movements of the price level over relatively long periods, most explanations of this longer-run relation between inflation and uncertainty are cast in terms of the monetary authorities' behavior and the public's response to it. For example, in an early paper (*BPEA, 2:1971*), Arthur Okun argued that if policymakers accept high inflation, accommodating a positive shock, they signal a willingness to accept future shocks. Thus, uncertainty about future shocks is translated into uncertainty about the trend rate of inflation. But if policymakers resist shocks, keeping inflation low even at the cost of a rise in unemployment and loss of output in the short run, there can be relatively little uncertainty about the trend rate. A second, related explanation traces the increase in uncertainty at high trend rates of inflation to the uncertainty about whether and when the Federal Reserve will be willing to pay the unemployment costs of disinflation.

Most empirical studies of the inflation-uncertainty relationship have simply correlated the mean rate of inflation with a measure of inflation variability, using either cross-country observations or observations on different periods within the same country. These studies typically show a strong positive relationship. While it is not variability per se, but uncertainty, that elicits the welfare costs of inflation, the results are similar when forecasting equations are used to distinguish between unanticipated and predictable variations in inflation. When inflation is high, there are greater unanticipated changes in inflation than when it is

low. These results, however, are contradicted by Robert Engle's work using a more complex technique that allows the conditional variance of inflation to vary autoregressively over time. Engle, and subsequent work with similar models, finds no evidence that high inflation in one quarter leads to greater variability of inflation in the next quarter.

That Engle's work puts heavy weight on the one-quarter-ahead forecast errors whereas other studies use longer periods (cross-country studies often using five- to ten-year periods) suggests to Ball and Cecchetti that the two types of studies are capturing two quite different phenomena. There could be virtually no short-run correlation between the level of inflation and inflation uncertainty while there is a significant relationship between trend inflation and trend uncertainty. Preliminary analysis of U.S. data for the period 1954-89 supports this possibility. The authors find, for example, that the correlation of the mean and variance of the GNP deflator for nonoverlapping periods of different lengths is 0.18 for one-year periods, rising to 0.43 for four-year periods and to 0.94 for ten-year periods. Similar effects are found for the correlations between current inflation and the subsequent squared change in inflation over various horizons.

This finding leads the authors to specify a formal statistical model that explicitly allows for a different relationship between inflation and inflation uncertainty at different horizons. The rate of inflation, period by period, is modeled as the sum of a permanent and temporary shock, where the permanent, or "trend," shock follows a random walk and the transitory shock is independently and identically distributed ("white noise"). This specification implies that, over short forecasting horizons, changes in inflation are dominated by temporary shocks, while over long intervals, changes are dominated by permanent shocks. The authors note that although trend shocks may not literally last forever, their model's predictions are essentially the same as those of a highly persistent AR(1) process except for the longest horizons. Although in principle they could allow for serial correlation of the transitory shocks, in practice they find such correlation insignificant.

By partitioning the uncertainty of future inflation into two components, Ball and Cecchetti are able to specify how the most recent level of inflation is related to each component separately. Their basic hypothesis is that trend inflation has a stronger effect on the variance of the permanent trend shocks than on the variance of the transitory shocks.

They test their hypothesis first by assuming that both variances are constant for a given country and estimating the cross-country relationship and then by dividing each country's data into five-year periods and estimating the relationship across periods. In each case, the variances of the two errors are estimated by maximum likelihood.

The authors report results for a variety of ways of grouping the data and price indexes. Qualitatively the results for the U.S. consumer price index are typical. For the six subperiods between 1960 and 1989, average inflation is highly significant in explaining the standard deviation of permanent shocks, with a *t*-statistic greater than 10, whereas it is insignificant in explaining the variance of temporary shocks. Although the high inflation of 1979–83 was accompanied by large movements in both the permanent and temporary components of inflation, in other periods of high inflation only the permanent movements were large. In particular, in 1969–73 and 1974–78, both periods of high inflation, the variances of temporary shocks appear to be fairly low. The authors' point estimates imply that a 1 percentage point increase in trend inflation raises uncertainty about next quarter only a statistically insignificant 32 percent, but raises the uncertainty about inflation five years out by a highly significant 174 percent.

The authors separately estimate the inflation-uncertainty relationship for countries experiencing only moderate inflation rates. When they assume that the variances of inflation for each country are constant for the entire sample period, the results are not consistent with their hypothesis; the level of inflation has a stronger effect on the standard deviation of temporary than of permanent shocks. But when they divide the country data into five-year subperiods and take into account country-specific fixed effects, the results are similar to their U.S. results. The effect of average inflation on the variance of permanent shocks is both statistically and economically significant, while the effect on the variance of transitory shocks is small and insignificant. These results appear to be relatively robust, coming through when time dummies are included, when the equations are estimated separately for the 1960s, 1970s, and 1980s, and when the GNP deflator is used in place of the CPI. The authors cannot reconcile the simple cross-country results that suggest that high-inflation countries have highly variable transitory shocks, with the results that changes in inflation within countries raise the variation of trend inflation but *not* the variation of transitory inflation. But they believe their dominant result is that high inflation has much larger effects on

uncertainty of inflation over the long term than on uncertainty over one or two quarters. Their results therefore explain the apparent contradiction between Engle's and other investigators' results.

Ball and Cecchetti cite the 1970s as a period when high inflation was associated with less stable policy. Initially the Federal Reserve accommodated the oil and food shocks of 1973, but tightened policy in response to the alarming increase in inflation in 1974. Inflation dropped, but the deep recession that followed produced another easing of policy. In contrast to this period of "stop-go" policies, the low inflation of the 1980s has produced steady policy aimed at keeping inflation low. But the authors also recognize that not accommodating inflationary supply shocks may have substantial costs in terms of variations in output and employment. Although they see no way to escape this output-inflation trade-off, they suggest that the Federal Reserve should avoid a stop-go reaction to inflation. Rather than abruptly tightening policy in response to inflationary shocks, they urge the Federal Reserve to follow a well-publicized commitment to gradual disinflation.

IN THE SECOND report of this issue, Ben S. Bernanke, John Y. Campbell, and Toni M. Whited follow up on an earlier paper by Bernanke and Campbell on increased corporate leverage and its implications (*BPEA, 1:1988*). In that paper, the authors calculated the distribution of financial conditions for a sample of almost 1,200 firms using two measures of financial stress: the ratio of the market value of debt to assets and the ratio of interest payments to cash flow. In this report, they examine how firms' financial vulnerability has changed, paying particular attention to the firms most exposed to bankruptcy. Since the original paper, aggregate data for 1987 and 1988 have become available, showing a sharp acceleration of debt for equity swaps among corporations in 1988, when net equity repurchases jumped to $130 billion after ranging near $80 billion in each of the three previous years. In contrast, the authors find that for the mean of *their sample*, corporate leverage was stable or decreasing in these two latest years, suggesting that their firms are more conservative than average and that their sample understates the changes in finance taking place in the entire corporate sector. Yet even in their sample, they find that the most exposed firms—those at and above the 90th percentile—became more leveraged still, as measured by either of the two measures of financial stress.

Although many highly leveraged firms have already been forced into

bankruptcy because they have been unable to meet their interest payments, the problem would be much greater if macroeconomic conditions were to deteriorate. To explore what might happen, the authors simulate the effect of a deep recession on their sample of firms, using the characteristics of the 1973–74 and 1981–82 recessions as benchmarks. In a 1973–74 type recession, which involves an especially large drop in the stock market's valuation of assets, just over 25 percent of the firms are insolvent by the second year, as measured by a net worth criterion, with projected debt-asset ratios greater than unity. In the event of a 1981–82 type recession, more than 20 percent of the firms are projected to have liquidity problems in the second year, with cash flow insufficient to meet interest costs. In additional simulations in which interest rates are kept fixed at the levels prevailing in the base year of the simulation, the results are very nearly the same, indicating that the liquidity problems observed in the simulations occur because of poor earnings rather than rising interest rates. The authors conclude that the financial risks to corporations in a new, major recession loom even larger now than they did two years ago at the time of the original Bernanke-Campbell study.

The authors examine the validity of some arguments that seek to explain why the increased indebtedness of corporations may be less of a problem than an analysis of leverage suggests, and why it may have benefits that outweigh the problems that it creates. According to some observers, the increased leverage of corporations does not pose risks for the stability of the macroeconomy because the increased debt is concentrated in noncyclical industries. When the authors disaggregate their data by industries, however, they find little support for this position. Within manufacturing, nondurable goods industries are less cyclical than durable goods industries. And although between 1970–75 and 1982–86, the average debt-asset ratio did rise in nondurable goods industries while it fell in durable goods industries, that trend has reversed. By 1988 debt-asset ratios were higher, on average, in durables. The ratio of interest expense to cash flow gives a similar picture. Disaggregating further, the authors find a wide diversity of experience among industries and no clear relationship between the cyclical sensitivity of industry earnings and either debt-asset ratios or the ratio of interest expense to cash flow.

Similarly, the authors find no support for the argument that increased leverage is beneficial because it improves productivity performance;

they find no relationship between leverage and growth in total factor productivity or between changes in leverage and productivity growth at the industry level. They recognize, however, that analysis at the industry level may be too aggregated to detect productivity effects that might be present at the level of the firm.

Finally, the authors find no evidence to support the idea that the nature of debt has changed so as to make it more easily renegotiated in times of financial stress. Rather, they note that junk bonds are generally more widely held than more traditional forms of private debt, presumably making it more difficult to reach a negotiated settlement with creditors. Furthermore they note that junk bonds often carry covenants that make it harder for a firm to borrow more if it needs additional cash.

IN THE THIRD report of this issue, William D. Nordhaus looks at the prospects for economic reform in the Soviet Union. He considers the options available to Soviet decisionmakers, with respect both to the ultimate goals for reform and to the strategy and timetable for achieving them. Although all the reform movements in the Soviet Union and Eastern Europe ostensibly endorse a market economy, Nordhaus observes that neither Soviet policymakers nor Soviet popular opinion has yet accepted the implications of pursuing that goal. The "Abalkin report," often taken as the nearest thing to a blueprint of Soviet plans for reform, would continue primary state ownership of several sectors of the economy that Nordhaus estimates would make up more than half of GNP. At the same time, public opinion in the Soviet Union is generally hostile toward entrepreneurial activity and has little understanding of how a market economy would affect the distribution of income.

Nordhaus presents a series of steps that need to be taken and obstacles that need to be overcome before the Soviet Union can achieve a workable market economy. First, prices of both inputs and outputs today are far from market-determined levels. They need to adjust to market levels to appropriately direct production and consumption. Second, enterprises have been operating with "soft budget constraints," meaning that profit and loss do not determine an enterprise's fate. Losses may lead to more credit or subsidies rather than to shutting down, as they would in a market economy. Third, the large deficit in the government budget is a principal cause of the excess demand and repressed inflation in the economy. Fourth, nearly all Soviet output is produced in the public

sector. Most of the economy will need to be privatized so that decisions about buying and selling, producing and pricing, borrowing and lending, are made by private agents in a decentralized market. Fifth, competition must be introduced through the establishment of numerous firms and exposure to international competition. Sixth, the infrastructure needed to operate a market economy does not exist. That infrastructure, from accounting rules, to contract laws, to financial institutions, to, hardest of all, people trained to operate in the new environment, must now be developed.

With so many changes needed, reformers are unsure about where to begin and how quickly to proceed. Nordhaus identifies three approaches that characterize the reform debate in the Soviet Union and elsewhere: the "big bang" approach, which would introduce all market reforms simultaneously and quickly, as is being attempted in Poland; the "step-by-step" approach, which would schedule gradually phased reforms; and the conservative approach, which would move cautiously, evaluating each small step before deciding where to go next. Even though it might succeed in some places, Nordhaus believes the big bang is inappropriate for the Soviet Union. The obstacles to reform are still too great, as is the risk that economic conditions will worsen before any benefits can be achieved and that reform could be stopped for political reasons. Nordhaus favors a step-by-step approach, but warns that it too has possible pitfalls. He notes that socialist states have evolved a set of rules designed to optimize economic performance in a command economy. Making a few rules more consistent with a market economy while retaining most features of a command economy is likely to worsen performance. Getting the speed of reform right may be critical. Whereas the big bang may lead to a political backlash, the reform process may also stall if the transition is too gradual.

Nordhaus observes that the Abalkin plan proposes a step-by-step approach, with three stages of reform taken over a period of six to ten years. In the first stage, the legal framework that a market economy requires, including laws on property, bankruptcy, and the like, would be introduced. In the second stage, substantive reforms would begin to be introduced, including stabilizing the budget, bringing prices closer to market levels, closing unprofitable enterprises, and establishing institutions for private credit. The third stage would see real free market activity, including foreign competition, partial ruble convertibility, and market-determined prices.

Nordhaus puts a higher priority on dealing promptly with the present macroeconomic imbalance in the Soviet economy than does the Abalkin report. The excess demand caused by the large government budget deficit and the excessive liquidity in the hands of the public is repressed by price controls that give rise to shortages, long queues, and inefficient distribution of goods. Nordhaus observes that the budgetary correction that is appropriate as macroeconomic policy is also compatible with improved social policies because so much of Soviet spending ought to be reduced for allocational reasons. In particular, Nordhaus notes that subsidies to food and agriculture amount to 24 percent of the Soviet budget or 12 percent of Soviet GNP, while subsidies to unprofitable enterprises account for another 10 percent of the budget, or 5 percent of GNP, and defense spending probably absorbs another 20 percent to 30 percent of the budget. Thus a promising start to reform would be to reduce spending sharply in all these areas.

Nordhaus's overall judgment about prospects for successful economic reform in the Soviet Union is not optimistic. At the political level, he sees both stabilization policy and price liberalization as farther out of reach today than they were in 1985, when the first steps toward economic reform were taken. Nor have pro-market sentiments grown in the Soviet Union as they have in some Eastern European nations. At best, Nordhaus anticipates that a successful move to a market economy is many years away.