Editors' Summary

THE BROOKINGS PANEL on Economic Activity held its sixty-sixth conference in Washington, D.C., on September 3 and 4, 1998. This issue of *Brookings Papers* includes the papers, reports, and discussions presented at the conference. The first paper analyzes the East Asian currency crisis, examining its predictability and causes, and evaluating the policy responses that were made. The second provides a modern version of the Keynesian liquidity trap as an explanation of Japan's deepening recession and offers an unorthodox policy prescription: promised inflation. The third paper examines the roles played by demographics and tropical geography in perpetuating poverty in Africa. The first report reviews the performance of conventional models of inflation during the recent period of outstanding macroeconomic performance in the U.S. economy. And the concluding report examines Japan's current banking problem, tracing its origins to the postwar evolution of the Japanese economic and financial systems.

THE BELIEF that the increasing globalization of commodity and capital markets and the opening of developing economies would usher in an era of economic prosperity and stability has been repeatedly challenged by major economic crises during the past twenty years. Currency and banking crises have been abundant. Since 1975, more than eighty-seven countries have experienced currency depreciations of over 25 percent in a single year; and on an estimated sixty-nine occasions, the entire banking system of a country had zero or negative net worth. At least in hindsight, the proximate causes usually seem apparent. The recent Asian crisis is a different matter. It occurred in the fastest grow-

ing region of the world, and many of the antecedents of other collapses were not present. Moreover, the crisis was especially virulent: the largest international rescue package in history did not stem the problem, and even today the outlook for many of the economies in the region is poor. In the first paper of this issue, Jason Furman and Joseph Stiglitz examine the East Asian experience, taking a fresh look at the causes of currency and financial crises, the extent to which they can be foreseen, the appropriate policy responses, and the costs and benefits of global integration.

The authors observe that there has been a remarkable shift in sentiment about the East Asian economies. Before the collapse, they were widely admired. Their outward orientation, high rates of saving, and effective governments were all cited as reasons for their extraordinary growth and stability. Since the crisis, they have been castigated for a host of deficiencies, including mismanaged exchange rates, lack of transparency, wasteful investment, and current account deficits. The authors note that many of the features earlier identified as keys to success are now seen as causes of failure. For example, the close relationship between government and business, which some viewed as coordination that efficiently handled information, is now seen as collusion that fosters political cronyism and inefficient allocation of resources. In retrospect, some have come to believe that the crisis was inevitable, despite the fact that these economies had weathered earlier shocks, such as OPEC, far better than other, seemingly less vulnerable economies.

All agree that the East Asian economies had achieved remarkable growth. The authors report that between 1966 and 1996, per capita income grew at average annual rates of over 4 percent in Indonesia, Malaysia, and Thailand, and over 7 percent in Korea; GDP grew in every year in Indonesia and Thailand and fell in only one year in Korea and Malaysia. Whereas in 1975 roughly six out of ten East Asians were in poverty, that fraction had fallen to two out of ten by 1995. Any explanation of the current crisis that blames a fixed characteristic of the East Asian system, such as directed lending, must also explain how the system did so well in the past.

The authors believe that the most plausible reconciliation of past with present involves both a changed environment that made past policies less appropriate and policy changes that made these countries more

vulnerable. They emphasize that integration with world capital markets and increased capital flows exposed the developing countries to international financial shocks and the changing sentiments of foreign investors. They also believe that internal policies, in both government and the private sector, that had served well at earlier stages of development were less successful in the larger and more complicated economies that emerged. In Korea, for example, heavy reliance on debt may have been a factor in rapid growth, but it left companies vulnerable to a slowdown. In the past, the government had mitigated the risks of this leverage by absorbing shocks through directed credit and other mechanisms. More recently, the government has been both less able and less willing to do so. They also argue that financial liberalization without commensurate strengthening of regulation and supervision was an important factor in the crisis, a view they trace to a pathbreaking study of Chile's 1982 crisis by Carlos Diaz-Alejandro.

Furman and Stiglitz consider what the East Asian countries might have done differently and what they can do in the future. In retrospect, some macroeconomic mistakes are apparent. They reason that governments should have been aware of the systemic risk to the economy from the high level of private borrowing from abroad, and discuss several sources of discrepancy between the private and social risk. Most important, borrowers do not take account of the social risk they impose when they issue short-term foreign-denominated debt to lenders who expect a bailout in the event of a systemic failure. The authors document the enormity of capital flows into the developing countries during the period, note the difficulty of distinguishing temporary from permanent flows, and report evidence that external factors explain a large fraction of the variations in flows. They note that even if governments recognized the risks, in an environment of liberalization they had few instruments with which to limit the size of the flows.

The authors argue that the East Asian countries were in a "fixed exchange rate bind" that severely limited their ability to deal with current account deficits. Capital inflows led to the accumulation of reserves which, when sterilized, raised interest rates. In Thailand, for example, short-term rates increased 4 percent relative to U.S. rates in 1996. With exchange rates expected to remain fixed, the higher interest rates increased short-term debt inflows, which, in turn, led to booming asset prices and encouraged the allocation of investment to the nontrad-

able sectors. This left the economies extremely vulnerable, with asset price bubbles and both currency and maturity mismatches between their assets and liabilities.

Furman and Stiglitz argue that there was no easy way out of this bind. Widening the exchange pegs would have accomplished little, and abandoning the pegs altogether in favor of a flexible rate carried its own risks. Given a reasoned commitment to maintaining the exchange rate, few policy choices were left. Tighter money might have reduced investment and the need to borrow from abroad but would also have increased incentives to finance with unhedged short-term debt. Fiscal policies could have been even tighter than they were, but the authors find it hard to fault governments already running surpluses, when more public infrastructure was needed and private saving was already very high. In the financial arena, they reason that well-designed regulations might have reduced banks' exposure but would not have prevented a shift to borrowing by other sectors. They do suggest, however, that broad restraints on international capital flows, especially short-term flows, could have complemented closer regulation of domestic financial markets, and so reduced risks.

The authors test their contention that the East Asian countries were pursing reasonable macroeconomic policies by examining whether the crisis could have been predicted. As previous analysts have noted, the East Asian crisis does not fit theoretical models that stress either persistent government deficits or the temptation of governments to devalue in order to expand output, since neither factor was important. Overvaluation of the real exchange rate was arguably a problem, since many countries were effectively tied to the dollar when it appreciated sharply against the yen. But the authors find no systematic connection between overvaluation and crisis. Indeed, they find that by some measures Korea was actually undervalued.

Furman and Stiglitz also examine the predictions of more eclectic empirical models that incorporate longer lists of macroeconomic and financial variables. They find that a model by Jeffrey Frankel and Andrew Rose featuring variables such as foreign direct investment as a fraction of total debt and the ratio of reserves to imports actually gives the East Asian countries a below average probability of crisis. They also show that a model due to Asli Demirgüç-Kunt and Enrica Detragiache predicts less than one banking crisis in twenty years for

each of the East Asian countries. According to this model, even knowing in advance the extent of the depreciations and recessions in 1997, one would have been very worried about banking crises only in Indonesia and Thailand. The authors also examine the usefulness of the leading indicator model developed by Graciela Kaminsky, Saul Lizondo, and Carmen Reinhart. They observe that it has a bias toward predicting crises in regions with a history of stability, like East Asia. While it predicts the East Asian crisis somewhat better than the previous two models, it does so at the cost of predicting many crises that never happened.

The authors are not surprised by the general failure to predict the East Asian crisis using historical data, noting that the region's economies had virtually none of the flaws that were common in Latin America, which has provided most of the historical experience. Because some have suggested that the recent Mexican crisis provides a more useful antecedent, Furman and Stiglitz also examine the predictive power of the "Tequila crisis," relying on the analysis of Jeffrey Sachs, Aaron Tornell, and Andrés Velasco. They find virtually no relationship between the factors found important in understanding Mexico and the depth and scope of the crises in East Asia. Using that model in the summer of 1997 would have provided no guidance.

Many observers have identified excessive short-term borrowing, with the resulting risk of capital flight, as a key factor in the onset of the East Asian crisis. Furman and Stiglitz report that studies based on earlier experience are inconclusive about the effects of short-term borrowing on currency or banking crises, but they find that short-term debt relative to reserves would have done a remarkable job of forecasting the events of 1997. In a sample of forty-two developing countries, eleven had short-term debt in excess of reserves; of these, all but three faced severe difficulties in 1997. The authors note that any decision to constrain short-term borrowing should balance the costs of interfering against the benefits of reduced crisis exposure. But they reason that for the East Asian economies, the costs of interfering were probably low. Various distortions artificially lowered the cost of short-term debt, and the high rates of domestic saving, augmented by capital inflows following liberalization, may well have driven returns to investment lower than private investors expected. They also believe that policies to inhibit short-term borrowing may be less problematic than is frequently sug-

gested. They cite the Chilean experience, where it is generally acknowledged that the reserve requirement on short-term capital inflows has significantly lengthened the maturity of inflows without reducing the inflow of valuable long-term capital, and they suggest that tax-based policies might work even better.

Another popular explanation for the East Asian crisis is lack of transparency, a term that loosely covers corruption, lack of accounting standards, and the unavailability of accurate information about the financial condition of firms, financial institutions, and governments themselves. The authors observe that this explanation permits investors to blame the affected countries rather than either their own lack of foresight or the liberalization of financial and capital markets. It also suggests that the corrective is internal reform by the affected countries, not restraints on international markets or actions by the developed nations, such as the creation of an international lender of last resort. The irony, the authors note, is that in focusing attention on the internal weaknesses of the affected economies, policymakers may have contributed to the severity of the downturn.

Little analysis has so far been offered of how lack of transparency would affect a currency or banking crisis; Furman and Stiglitz attempt to fill the gap. They observe, first, that if lack of transparency contributed to the crisis, the East Asian economies must have become less transparent, or their need for transparency must have increased, or it was not transparency per se that mattered, but news about it. They find no such news, since the lack of transparency was already widely known. Nor do they find clear evidence of changing transparency. They acknowledge that the integration of world capital markets may have increased the need for transparency in the years before the crisis. But in light of the large increase in capital flows and decline in risk premiums that occurred, they reject the notion that international investors had raised their standards for information disclosure and accuracy. They also find only mixed evidence on whether corruption had increased in the economies of the region.

To assess the effect of transparency on vulnerability, the authors turn to the burgeoning work on the economics of information. Much of this research has illuminated the ways in which better information may lead to improved resource allocation. Furman and Stiglitz observe that lack of transparency should generally affect the variance but not the mean

of people's expectations, and that when people know less, any information will have a larger effect on their beliefs. These observations suggest one way in which a lack of transparency might be a factor in a crisis. With little transparency, for example, a downturn might lead to large downward revisions in estimates of fundamentals, sharply lowering asset prices, raising risk premiums, and exacerbating the decline. Relatedly, a shock that ought to affect the fundamentals of some firms but not others may produce widespread credit rationing because markets cannot distinguish the winners from the losers. Although the authors believe that lack of transparency probably contributed to the downturns in East Asia through these channels, they note that the effects of transparency on credit rationing and market volatility in general are uncertain, and provide several models to illustrate this point.

Furman and Stiglitz note that the ambiguity about the value of greater transparency is not just a theoretical curiosity. In the United States and elsewhere, bank regulators resist mark-to-market accounting and central banks provide only limited information about the bases for their decisions, evidently convinced that too much transparency may not be a good thing. But the authors believe that the thinness of markets in developing economies exacerbates the information problem and agree that these countries should improve their transparency. In the East Asian crisis, lack of transparency had clear costs: the market knew that some firms were weak, but could not tell which these were. As a result, it restricted the supply of capital to all firms, exacerbating the downturn.

One of the most contentious issues in the East Asian financial crisis was how far to raise interest rates in an attempt to stabilize currencies. The authors note that both large exchange rate depreciations and long-lasting increases in real interest rates are costly. However, whether temporarily higher interest rates can permanently strengthen exchange rates and whether higher interest rates could actually depreciate rather than support a currency in the short run are important open questions which they examine both theoretically and empirically. They first consider the common assumption that raising today's interest rate will strengthen today's exchange rate. The standard model assumes that markets equilibriate the expected returns from holding the domestic and foreign currency. Hence expectations about the future course of interest rates tie today's exchange rate to its expected long-term value. An increase in the interest rate attracts foreign funds, and if the expected

future exchange rate remains unchanged, this appreciates today's exchange rate. If raising interest rates is expected to lower the future price level, as is generally assumed, it also strengthens the expected future exchange rate, and thus adds to the current appreciation.

But the authors note that an increase in interest rates could actually lower the long-run value of the currency by decreasing investment or reducing exports. In such circumstances, the effect of the interest rate increase on today's exchange rate is ambiguous. Furthermore, higher interest rates could reduce the expected exchange rate by raising the risk of default for countries in crisis. The authors emphasize that even if these effects do not lead to a perverse exchange rate response, the rate increase needed to prevent or reverse a large depreciation may be huge. For example, an investor anticipating the actual depreciation of the Indonesian rupiah between July 1, 1997 and January 30, 1998 would have stayed in rupiah only for a 1,700 percent annualized return sustained over seven months. The sheer magnitude of the rate increases required to stabilize the currency makes prospects for a perverse response more likely.

In the standard analysis, a temporary increase in interest rates strengthens the exchange rate temporarily; the exchange rate reverts to its long-run path when interest rates return to initial levels, except insofar as the temporary increase changes the long-run equilibrium. A temporary increase in rates could offset a temporary shock, but that would simply avoid a temporary devaluation. Most policymakers appear to have something different in mind: a temporary increase in rates as an effective response to a permanent shock. The authors discuss three mechanisms that could give this result: buying time for reforms, signaling, and multiple equilibria. Buying time to institute reforms that will strengthen the exchange rate is a common rationale for higher rates. But the authors reason that if the reforms were credible, there would be no need to raise rates. The need to raise rates implies that the reforms are not credible, and may even signal the government's worry about their credibility. The authors believe that the effect of reforms on the expected future exchange rate is probably as much a matter of psychology as of economics. They are skeptical of the ability of government officials to predict market psychology and critical of the insufficient attention paid by the rescue packages to likely market reactions and the possibility of capital flight. They see a stronger argument for

not tightening fiscal policies in the East Asian economies. In these economies, which had been pursuing prudent fiscal policies and where aggregate demand and supply were roughly in balance, a fiscal contraction would accentuate the downturn, increase the probability of bankruptcy and uncertainty about the future, and thus further depreciate the future equilibrium exchange rate.

Furman and Stiglitz contend that the strongest case for a high interest rate policy is that it may signal greater resolve to pursue low inflation. However, they point out a number of ambiguities and subtleties in signaling mechanisms. First, strong and painful policy actions may be interpreted as a sign of serious economic maladies, depressing the private sector's expectations. Second, for a signal to be effective, it must be costly, or else the monetary authority would signal its resolve at all times. But third, if the costs of signaling are too high they will not be credible, because no one will believe that they will be sustained. The authors note that countries that already have a reputation for good macroeconomic policies are likely to receive less benefit from signaling because their resolve is less in question. On these grounds, a high interest policy would be less effective in East Asia than it was in Latin America.

Multiple equilibria models provide another mechanism by which a temporary policy action might change the long-run equilibrium of an economy. In this context, the authors emphasize the potential for high interest rates to affect the economy adversely by their effects on financial markets and the condition of banks and firms. They discuss several channels by which temporary interest rate increases could permanently weaken exchange rates: eroding the net worth of both debtors and banks; increasing the probability of default and the perception of risk, and thus promoting capital flight; increasing bankruptcies, and so disrupting both output and investment; encouraging gambling and looting behavior by firms and financial institutions, by eroding their net worth; and causing credit constraints by worsening balance sheets.

The authors reason that these factors shift in the aggregate supply curve, reinforcing a reduction in aggregate demand and amplifying the reductions in employment, which, in turn, further damage firms and exacerbate the supply-side effects. Moreover, they suggest that these effects are likely to persist long after interest rates have returned to more normal levels. Hence they argue that in such models, a policy of

raising interest rates is more likely to lead to a "bad" low exchange rate equilibrium than to a "good" high exchange rate equilibrium. They recognize, however, that the occurrence of such a bad equilibrium will depend on the particular circumstances. In some cases, temporary interest rate increases could permanently strengthen the exchange rate. In Latin America, for example, where firms were not highly in debt and most debt was long term, higher interest rates may have helped to stabilize currencies. But in East Asia the opposite conditions prevailed.

Given the importance of the issues and the theoretical ambiguities, it is surprising how little empirical analysis there has been on the success of temporary monetary restraint in defending currencies. The authors report on two studies involving a significant number of observations. One finds no evidence that tighter monetary policy affects the success of speculative attacks. The other finds that tighter monetary policy increases the probability of a successful recovery of the currency by about 10 percent when all observations are included, but lowers the probability of success by about the same amount for countries that suffer banking and currency crises, such as those in East Asia.

The authors also provide their own evidence: a detailed discussion of the contrast between the Brazilian and Indonesian experiences in 1997 and a regression analysis of high interest rate policies in developing economies. In both Indonesia and Brazil, high interest rates initially prevented the currency from depreciating, but the eventual outcomes were quite different. In Brazil, interest rates were brought back down to precrisis levels after about two months, and the exchange rate maintained its trajectory. But when Indonesian authorities began to lower interest rates gradually, the exchange rate plummeted. These results are not easy to rationalize with standard models—Brazil looked more vulnerable than Indonesia in all of the crisis prediction models reviewed by the authors, and most estimates suggest that the initial exchange rate was more overvalued. Nevertheless, Brazil appears to be a prime candidate for the signaling model, with high interest rates indicating the government's willingness to take costly measures to sustain its crawling peg. By contrast, Indonesia's monetary policy had been more prudent, so that raising rates provided little new information. The Indonesian economy was also much more vulnerable to high interest rates than Brazil's, and therefore the direct economic effect of the

interest rate increase was probably to weaken rather than to strengthen the equilibrium exchange rate.

The regression analysis uses thirteen episodes of abrupt but brief increases in interest rates in nine emerging market economies between January 1992 and June 1998. The authors presume these were instances of the authorities attempting to defend the currency. In general, they find that higher interest rates are associated with depreciation, although the exact results vary with the specification used, and the effect is generally larger in lower inflation countries. They recognize that ascribing a causal interpretation to these results is risky, given the endogeneity of policy, and that the effect of lower inflation is indistinguishable from that of not being a Latin American country. But they note that the results are consistent with the theoretical models they describe and with their own interpretation of the differences between Brazil and Indonesia. At the very least, they question the presumption prevalent in some policy circles that increasing interest rates is an effective mechanism in a crisis, particularly for low-inflation countries, such as those in East Asia.

While financial markets in several of the affected East Asian countries have stabilized in past months, most of these economies have moved into deep recessions, if not depressions. Many of the issues that confronted policymakers at the onset of the crisis remain. One lesson is that crises differ. In the authors' view, the East Asian crisis was largely the result of private decisions gone wrong, rather than misguided macroeconomic policies, as in previous crises in other parts of the world. In part this was simply a matter of miscalculation, both by industrial country lenders and East Asian borrowers; in part it reflected features of the financial system that gave rise to significant differences between private and social risk. Existing models based on other crises did not predict this one. But high levels of short-term debt relative to reserves appear to have greatly increased a country's vulnerability. This suggests a potential value for policies that reduce dependence on short-term foreign borrowing. As a general lesson, the authors warn that rapid financial liberalization without corresponding improvements in transparency, regulation, and financial infrastructure is risky. They suggest that, even with hindsight, there is no easy answer to how best to respond to a crisis and conclude that no single policy will be appropriate for all countries in all circumstances.

AFTER A DECADE in which average growth exceeded 3.5 percent and real growth in no year fell as low as 2 percent, Japan's economic performance has been dismal since 1991. GDP growth has averaged less than 1.5 percent, and output actually fell during 1998 and is forecast to continue to decline in 1999. Japan is the world's second largest economy. Its economic malaise not only threatens the prospects for recovery in the rest of Asia but endangers economic expansion around the globe. Japanese policymakers have been struggling, with little success, to stimulate the economy. Expansionary fiscal policy has been politically difficult to enact, and many are skeptical that even the recent packages will be sufficient. Monetary policy, widely regarded as the most effective and readily available tool for stimulating aggregate demand, appears hamstrung. With short-term rates below 1 percent for several years and now only fractionally above zero, the Bank of Japan arguably has little room to do more. This situation is distressingly reminiscent of the United States and other Western economies during the Great Depression, which many believe involved a liquidity trap: monetary policy was ineffective because nominal interest rates could not be driven any lower. In the second paper of this issue, Paul Krugman revisits the liquidity trap, modernizes its theoretical basis, and proposes an innovative monetary policy to help Japan escape the trap.

Krugman begins with a series of stylized theoretical models designed to illuminate the essential elements of a liquidity trap. His objective is to provide a rigorous theoretical underpinning for the phenomenon that is not vulnerable to contemporary criticisms of Keynesian analysis. In particular, his models are explicitly intertemporal and assume rational expectations. He also adds features not present in earlier models, allowing for foreign trade and capital mobility and incorporating financial intermediaries, thereby allowing a distinction between currency and reserves and broader measures of money and credit. In all these models, of course, the nominal rate on money is zero, providing a floor to the rate on bonds. At a zero rate, the public is willing to exchange bonds for any amount of money injected into the system.

Krugman begins with a flexible price model, demonstrating that the existence of a liquidity trap does not depend on price stickiness as frequently assumed in Keynesian analysis. The simplest model is a one-good, endowment economy with a representative agent. At the beginning of each period, individuals trade cash and one-period bonds at the

nominal interest. The central bank can engage in open market operations, buying or selling bonds for cash. After completing capital transactions, individuals go to the market to buy the consumption good, but their purchases are "cash in advance," constrained to be no more than the quantity of money that they hold. Since the model is explicitly intertemporal, in equilibrium individuals must be content, given the nominal interest rate today and expected price levels and endowment income in the future, to consume the actual endowments period by period. Since the endowments are exogenous, the equilibrium real interest rate depends simply on individuals' utility functions and rates of time preference—the real rate is the sum of the rate of decline (with growing consumption) of marginal utility and the pure rate of time preference. It follows that the time path of the money supply can only affect the time path of prices and nominal interest rates. For example, if endowments are constant from tomorrow forward, all future real interest rates will equal the rate of time preference, and if the money supply is held constant, so is the price level. With zero inflation in the future, the nominal rate will equal the real rate.

Given a constant future money supply, consider what would happen with alternative money supplies in the first period. So long as equilibrium nominal rates are positive, individuals will hold exactly the amount of money necessary to purchase the first period's endowment; they would be foolish to hold more money than they need for their purchases, given the opportunity to invest at a positive rate. Doubling the first period's money supply will double the price level for one period. Consumers will expect a return to the future (constant) price level, requiring a decrease in the one-period nominal rate to maintain the real rate determined by endowments and preferences. So long as the nominal rate is above zero, proportionality of prices and the money supply holds. Now suppose that the money supply is increased to the point that the expected rate of deflation equals the equilibrium real rate, implying that the nominal rate is zero. Any further increase in the money supply will simply be held as idle balances by individuals—they will be indifferent between bonds with a zero interest rate and money. This is a liquidity trap. In this flexible price world, however, monetary policy has lost its ability to increase the price level, as opposed to losing its ability to increase the level of output in a Keynesian world. In this full-employment model, the economy will have the same real interest

rate whatever the central bank does. But since the nominal interest rate cannot become negative, the economy has a minimum rate of inflation, or a maximum rate of deflation.

Krugman extends the model to include production and, to capture the idea of sticky prices in a simple way, assumes that the price level is fixed in the first period but is flexible thereafter. In this model, outside the trap increasing the money supply in the first period lowers the nominal and real rates together. First period consumption and production can increase if the economy is below capacity. But the limit on downward movement in the nominal rate limits the amount of expansion; there is no guarantee that the monetary authority can maintain full employment.

Under what conditions is a liquidity trap likely to occur? One possibility is that people expect deflation, so that even a zero nominal rate corresponds to a high real rate. Another possibility is that the real rate corresponding to full employment is itself negative. This is usually regarded as unlikely but may be plausible in Japan today, with short-term forecasts of an absolute output decline and long-term forecasts of a decline in labor force. In Krugman's model this possibility would follow directly from projected future declines in per capita consumption, so that the discounted marginal utility of consumption is higher tomorrow than today. It may seem less likely that the full-employment real rate would be negative once the existence of capital with a positive marginal product is recognized. Krugman notes two reasons why this does not eliminate the possibility. One is the importance of a risk premium on capital. The interest rate that is constrained to be non-negative is a riskless rate. With a risk premium of 5 percent, the economy would be in a trap with an expected return on capital of 5 percent. Second, capital is durable, so the short-term return to investment in capital reflects not only its current marginal product but also changes in its value. He demonstrates the possibility that the decline in value could lead to a negative real rate, using an overlapping generations model in which the labor force declines over time, an assumption that may be appropriate for a number of developed countries besides Japan. For simplicity, the model includes infinitely lived land as the productive asset, but it is clear that a model with long-lived capital would have the same characteristics.

Some economists have suggested that the solution to saving in excess

of domestic investment at a zero interest rate is investment abroad. This appears to eliminate the threat of a trap so long as returns are positive elsewhere. While recognizing that capital exports may help, Krugman suggests that the economics of capital exports is not as favorable as supposed. He notes that capital flows, even if they succeed in maintaining a positive real rate measured in terms of tradables, do not prevent the real interest rate in terms of nontradables, or a consumption bundle of tradables and nontradables, from falling below zero. He demonstrates this possibility in a model in which tradables and nontradables are not perfect substitutes in consumption and prices are sticky in the nontraded goods sector. In this case, a temporary monetary expansion will lower the nominal interest rate, with different effects on the two sectors. Since the real interest rate in tradables is tied down by world capital market equilibrium, there must be deflation (in domestic currency) of traded goods prices. And since the future price level is tied down by future monetary policy, the current price of tradables must rise through a nominal depreciation of the exchange rate. The situation for nontradables, however, is the same as in a closed economy; the lower nominal rate will normally lower the real rate, and both consumption and production will increase. But just as in the closed economy, even if the interest rate is pushed to zero there may be less than full employment; the effect of expansionary policy on the current exchange rate is limited, because it is tied down by the future.

The United States during the Great Depression is the main historical example of an economy with near zero nominal rates and a sustained period of high unemployment, and Krugman takes a closer look at what that experience reveals about liquidity trap economics. He observes that how one interprets the radical difference between the growth of the monetary base and broader aggregates is crucial to whether one interprets the Depression as a liquidity trap. The monetary base rose slightly at the start of the 1930s and then rose steeply throughout the remainder of the decade. By contrast, M2 fell by more than a third and did not surpass its 1929 level until 1939. To analyze this differential behavior, Krugman augments his basic cash in advance model with intermediaries supplying inside money—deposits. These deposits, along with currency and bonds, can be traded by consumers in the capital market. Following Douglas Diamond and Philip Dybvig's classic paper on intermediaries, individual consumers are uncertain about their preferences for current

versus future consumption at the time of capital transactions, but the uncertainty is resolved by the time they go to the goods markets.

It is this idiosyncratic uncertainty that provides a role for banks. Even though consumers are individually uncertain about their use of deposits, withdrawals from banks are predictable because of the law of large numbers. Thus banks can invest some of their deposits in earning assets rather than reserves. With positive interest rates, individuals hold no currency and banks hold just the amount of currency reserves required to satisfy deposit withdrawals, investing the balance in bonds. Krugman shows that this model replicates the results of his basic model. Increases in cash, now the monetary base, lead to proportionate increases in the current price level and a reduction in the nominal rate. But if the nominal rate is driven to zero matters are more complicated. Consumers become indifferent among holding currency, deposits, and bonds, and banks become indifferent between holding currency reserves and bonds. Exactly where an increase in the monetary base goes in these circumstances is indeterminate; only in the case in which consumers substitute currency for bonds rather than for deposits will there be any positive effect on a monetary aggregate consisting of currency plus deposits. Substitution of currency for deposits by consumers will leave the monetary aggregates unchanged, as will substitution of reserves for bonds by banks. In a liquidity trap, not only are prices and output beyond the reach of the monetary authority, but in addition there may be little evidence of monetary expansion in the aggregates. Expansion of the monetary base is consistent with decreases in both bank deposits and credit. Hence the model helps to explain the monetary phenomena of the Great Depression.

All the examples of policy ineffectiveness until this point have taken future monetary growth as given. Krugman emphasizes that in his stylized models only temporary monetary expansions are ineffective. The central bank can get the economy out of a trap if it can credibly promise a future rise in prices. Since proposing future inflation as the solution to an economic slump is novel, Krugman discusses some potential criticisms. For example, he argues that inflation does not produce perverse incentives or misallocations in a trap situation. He also discusses extensively the "beggar thy neighbor" character of an inflationary policy, showing that inflating one's way out of a trap need not be more damaging to one's neighbors than is a conventional expansionary mon-

etary policy with flexible exchange rates. Utilizing his intertemporal framework with tradables and nontradables, Krugman constructs a beggar thy neighbor coefficient that measures what fraction of an output expansion is an increase in the current account surplus. In the model, the coefficient depends critically on preferences. In the extreme case of log utility, a monetary expansion has no effect on an expanding country's current account. Krugman computes the coefficient for parameter values that reflect greater risk aversion and shows that the expansion of the current account surplus relative to growth in GDP may be much smaller than other observers have suggested.

Having laid out the theoretical argument for the existence of liquidity traps, Krugman turns to the specifics of the Japanese situation. He reports that as of his writing, money market rates were at 43 basis points, a very good approximation of a trap. How did this come about? Krugman judges that if the U.S. personal saving rate jumped to the Japanese level and monetary policy were used in an attempt to maintain full employment, interest rates would be pushed near zero. But in Japan the personal saving rate is slightly lower than it was before 1990. Thus the obvious culprit is a decline in investment demand, and the most obvious proximate cause is the decline in output growth itself, with its accelerator effect on investment. But output growth is endogenous, and Krugman identifies the prospect of a declining labor force as a more fundamental factor depressing current investment. The Japanese labor force has peaked and is expected to decline by about 0.7 percent per year for the next thirty years. Since this shrinkage has been anticipated for some time, it remains puzzling that investment did not weaken earlier. Krugman suggests that one reason may have been the bubble economy of the late 1980s.

How urgent is the need to restore growth in Japan? If the dismal growth since 1991 were largely a decline in potential output, the payoff to finding an effective policy may not be great. Published estimates of the gap between actual and potential GDP in 1997 are relatively modest. But Krugman is skeptical. He notes, for example, that the International Monetary Fund's estimates are based on a Hodrick-Prescott filter that automatically reduces the estimate of potential GDP with any prolonged slump in actual output. In a protracted economic slump, this methodology would eventually interpret any prevailing level of employment and output as full employment. Applying the filter to the United States

in the interwar period provides a stark illustration of this defect: it implies that U.S. GDP returned to its potential by 1935. Unemployment was then 20 percent and annual real growth averaged almost 6 percent in the subsequent five years. The Organisation for Economic Cooperation and Development's estimate of a 1.2 percent gap in 1997 is based on a more elaborate technique but may have a similar bias because estimates of normal hours and productivity commingle cyclical and secular movements. As an alternative way to estimate output gaps, Krugman looks at Okun's Law. He finds that a Japanese version fits surprisingly well for the period 1982–91. If the average unemployment rate in the period before the slump is taken as full employment, the implied output gap is 5 percent in 1997 and could approach 10 percent by the end of 1998. He judges that the output gap in 1998 will be at least 8 percent, and so believes that there is an enormous return to finding a way out of the present liquidity trap.

Some observers have suggested that the troubled financial condition of Japan's banks lies behind the ineffectiveness of the central bank. While he agrees that disruption of intermediation has played a crucial role in many crises, including the current crises in the emerging economies of Asia, Krugman is not persuaded that banking problems have been central to Japan's current difficulties. He notes that Japan has not suffered any widespread run by depositors that would force the liquidation of loans. Furthermore, he notes that in the absence of a run, banks in trouble would be expected to overlend on risky projects rather than to restrict credit, a bias seen among U.S. thrifts before the regulatory crackdown in the savings and loan crisis. Moreover, he reports that nonbank subsidiaries of Japanese financial institutions grew rapidly in 1990–91, even as asset deflation was underway, and that a credit squeeze only became apparent in 1998, after capital adequacy standards were tightened. Thus Krugman argues that the credit crunch did not appear when banks were getting into trouble, but when it was clear that the government was likely to do something about it. The fact that cleaning up the financial system may temporarily weaken bank lending and the economy is not, in his view, a reason for delay. For microeconomic reasons, he judges that "the most important thing is to get on with the job and get it over with."

But Krugman believes that even if the banking system is cleaned up promptly Japan will remain in a liquidity trap and he doubts, for both

political and economic reasons, that fiscal policy is up to the task of pulling the economy out of its slump. He is skeptical of the multiple equilibria view that a temporary stimulus can "jump start" the economy to a favorable equilibrium and is wary of the long-run economic consequences of running a sustained deficit large enough to close the current output gap. Therefore Krugman thinks it essential to reestablish effective monetary policy. And his analysis suggests an unorthodox solution: a credible commitment to future inflation. If expected future inflation can be raised sufficiently, the real rate of interest can fall to the level required to increase output, even with nominal interest rates near zero. How high would expected inflation have to be, and for how long would it need to maintained? Based on plausible estimates of the elasticity of demand with respect to real interest rates, the size of the output gap, and the permanence of the demand shortfall, Krugman speculates that a commitment to about 4 percent annual inflation for fifteen years is needed. While Krugman does not take this number too seriously, he is convinced that the liquidity trap is neither an historical myth nor a modern irrelevancy. Not only has it appeared in Japan, but he suggests that it could also happen elsewhere, and he urges research to better understand the phenomenon and provide effective cures.

RAPID ECONOMIC GROWTH and improving living standards have benefited almost all regions since the industrial revolution. Sub-Saharan Africa (hereafter Africa) stands out as the one exception. Estimates by Angus Maddison show that relative to the richest regions of the world, the per capita GDP of Africa has fallen from one-third in 1820 to one-twentieth today. Some had hoped that economic performance would improve once these nations emerged from colonial rule. Instead, it has grown worse. African per capita income declined by 1.2 percent a year during the 1980s and by 0.9 percent a year between 1990 and 1996. In the third article of this issue, David Bloom and Jeffrey Sachs analyze this dismal economic performance. While they recognize the importance of a range of political, social, and external factors that have been identified as contributing to Africa's poverty, they focus on its highly disadvantageous economic geography. They believe this lies behind many other proximate causes of the region's poor performance and that an understanding of geography's role is key to formulating policies to improve economic growth.

Most of Africa lies in the tropical zone. Bloom and Sachs begin with a general comparison of economic development in tropical and temperate regions and an extensive discussion of Africa's particular geographic characteristics. Tropical economies average only one-third the GDP per capita of nontropical economies. Similar disparities exist within countries such as Australia and Brazil that straddle the tropics and temperate zones, and also within the African continent: tropical sub-Saharan Africa averages only one-quarter the per capita income of South Africa. The authors hypothesize that the income gap of the tropics reflects three forces: endogenous technical change that is biased toward the large markets of the temperate zones, where most of the world's population is located; inherent difficulties in diffusing technical change across ecological zones, as seen in the way technologies spread from the populous temperate north to the temperate regions of the south, skipping the tropics; and problems in agriculture and health that are inherent to the tropics.

Successful agriculture requires the right growing conditions. While the tropical latitudes are generally characterized by high sea-level temperatures and twelve hours of daylight throughout the year, in other respects climatic and ecological conditions vary widely. Within Africa, year-round rainfall in a 10° latitude band around the equator produces tropical rainforests. On either side of this band, alternating wet and dry seasons produce grasslands that cover roughly 60 percent of the African continent, generally drier the further from the equator. Beyond the 20° latitudes, the climate is so arid that it produces desserts. Within these general parameters, land at high altitudes receives more rain than land at sea level, leading to a concentration of population in the highlands of regions such as East Africa. Compared with other tropical regions, Africa has a large land mass whose temperature is not moderated by the ocean. And except for a part of West Africa, it lacks the monsoon effects that provide rainfall in parts of Asia. As a consequence, much of Africa is at risk of drought.

In addition to these broad climatic disadvantages, Bloom and Sachs describe a host of botanical considerations that limit the crops that can be grown in much of Africa and account for the observed patterns of food production. Agriculture is relatively successful in the East African highlands, but these areas are isolated from internal and international

trade. Large parts of equatorial West Africa are rainforest zones amenable to only a few cash crops, such as cocoa. The more arid regions outside the equatorial zone can produce little, and some woodland areas that might otherwise be reasonably productive suffer from pests, poor soils, and high temperatures.

Health is another great handicap to economic development. The authors report that even after controlling for per capita income levels, tropical populations have lower life expectancies at birth than temperate zone populations; and health conditions in Africa are especially poor in comparison with the rest of the tropics. In Africa, 43 percent of disability-adjusted life years are caused by infectious and parasitic diseases, compared with 29 percent in India and 3 percent in Europe.

To illustrate the core health issues for the region, Bloom and Sachs examine the transmission of malaria and HIV/AIDS. The capacity for the spread of malaria depends on the longevity of the mosquito host relative to the latency period of the disease within the mosquito. The latency period is shorter the hotter the ambient temperature, so that malaria spreads rapidly in the tropics and is absent from cool climates. This, together with the fact that the mosquito that most readily transmits the disease is indigenous, is the reason malaria continues to be a major problem in Africa even though it has been largely eradicated in most parts of the world. The authors cite estimates that the costs of medical care and lost productivity due to malaria were 1 percent of African GDP in 1995. They conjecture that the total costs of malaria in terms of retarding economic development far exceed these direct costs, since the disease inhibits foreign investment and tourism.

Bloom and Sachs judge HIV/AIDS an even more daunting health problem than malaria for Africa's economic future. Among HIV-infected people in the world, six out of ten men, eight out of ten women, and nine out of ten children live in Africa. Many children are infected at birth, others are infected as infants through breastfeeding; and those orphaned by the disease face bleak economic and social futures. Although it is difficult to link the AIDS epidemic to geography, the authors identify a number of social and economic characteristics that contribute to its spread in Africa. And the toll from the disease is rising: over 4 million Africans died of AIDS from 1985 to 1995 and nearly 10 million more deaths are expected by 2005.

Bloom and Sachs point to transportation difficulties as another major disadvantage for African development. They identify several geographic features that contribute to these difficulties: large distances from major world markets; separation from Europe by the vast Sahara desert, which is larger than the continental United States; a short coastline relative to land area; few natural ports along the coastline; populations that are generally located far from the coast; the highest proportions of landlocked states and of population within landlocked states of any continent; and the absence of rivers into the interior that are navigable by ocean-going vessels. The authors report earlier research showing that high coastal density supports economic growth by facilitating the division of labor and other benefits of trade. Only 19 percent of Africa's population lives within 100 km of the coast, and only a few percent more live near navigable rivers. This compares with 67 percent of the U.S. population and 89 percent of Europe's population living near the coast or navigable rivers.

Bloom and Sachs also discuss a variety of demographic features, often reflecting geographic factors, that contribute to Africa's poverty. Because of the dependence on low-productivity agriculture, only 31 percent of the population live in urban centers. Low population densities and rates of urbanization, in turn, make it expensive to provide infrastructure services. Finally, despite its significant health problems, Africa has experienced high fertility rates alongside declining youth mortality rates, which together have resulted in a swelling of the youth cohort and an increase in the ratio of the dependent to working-age populations. The authors see the high dependency ratio as a further impediment to growth through the burden it places on the region's limited education resources and through other channels.

To test their ideas about the sources of Africa's poor economic growth, Bloom and Sachs turn to cross-country regressions, using data for seventy-three African and non-African countries from 1965 to 1990. They explain the growth rate of GDP per capita using two kinds of variable: first, standard variables from the growth literature, including fiscal measures, openness to trade, the quality of institutions, liquidity measures, educational attainment, and initial GDP per worker; and second, additional variables related to demography, geography, and health. These additional variables are the fraction of land area that is in the tropics, population densities near to and away from the coast, life expectancy, the proportion of land in the tropics, the length of

coastline relative to land area, growth rates of the working-age and total populations, and an African dummy.

The authors find considerable support for their analysis of Africa's problems. When only the African dummy is used along with the standard variables, it indicates that per capita GDP grew about 2 percent a year slower in African nations, other things equal. But controlling for their additional variables—age structure, life expectancy, the percentage of land in the tropics, and the ratio of coastline to land area—eliminates the significance of the African dummy and substantially improves the fit of the regressions, indicating that the authors' variables help to capture the factors underlying growth in Africa and elsewhere. When the eighteen African and fifty-five non-African countries in the sample are considered as separate groups, the results cannot reject the hypothesis of common regression coefficients for both. The results also suggest that the African disadvantage does not arise from social characteristics or stocks of social capital, as some previous researchers have surmised.

Bloom and Sachs use their regression estimates to explain the growth differential between Africa and other parts of the world between 1965 and 1990. Over this period, Africa grew 4.3 percentage points slower than East and Southeast Asia, 2.1 percentage points slower than Latin America, and 3.6 percentage points slower than the world generally. Differences in age structure, geography, and health collectively account for 63 percent, 101 percent, and 78 percent, respectively, of these growth gaps between Africa and other regions. Among the traditional variables, openness is by far the most important in accounting for the growth gaps. This supports the idea that the attempts by most postindependence African governments to industrialize through import substitution failed badly.

Given the geographic and demographic factors that they identify as underlying Africa's problem of poverty, Bloom and Sachs discuss what growth strategies might be helpful. They start by seeking lessons from successful tropical economies. Within Africa only Botswana, with its unique diamond resources, and the island nation of Mauritius are in this category. Outside the African region, six tropical countries averaged per capita GDP growth greater than 3 percent a year during 1965–96: Hong Kong, Indonesia, Malaysia, Sri Lanka, Singapore, and Thailand. The authors draw on the extensive literature on these economies to identify key factors in their success.

The authors find that an industrial policy aimed at promoting manufacturing exports has been at the core of the growth strategy of all successful tropical economies. In many cases, expansion in these sectors permitted diversification of production away from tropical commodities that faced limited demand growth and little opportunity for technical progress. In implementing such growth strategies, these Asian economies attracted multinational firms with a variety of institutional accommodations, including tax-sheltered export processing zones, concessions on duties and on export-oriented foreign investment, and other measures designed to attract export-oriented industries.

Bloom and Sachs believe many African nations will have problems establishing manufacturing export sectors. Because most manufacturing in emerging economies relies heavily on imported intermediate products, the inland economies are at a transport cost disadvantage and will need to concentrate on adding value to locally produced commodities, such as coffee or cotton. And even the coastal economies must overcome a number of problems. Here the authors identify poor port services, unreliable power, abusive customs agents, and disadvantageous tax laws as barriers to duplicating the success of other developing nations. While they acknowledge that the reasons for these barriers and for Africa's lack of manufacturing competitiveness more generally are not well understood, they are critical of the advice that the International Monetary Fund and the World Bank have provided on this matter. They argue that loan programs have been ambivalent about, if not outright opposed to, the establishment of export processing zones and tax concessions aimed at attracting export-oriented manufacturers, both features of Asian nations' success.

Bloom and Sachs warn that Africa poses a complex development challenge and that many of the factors that have contributed to its impoverishment over the years are not easily changed. While they support a major commitment to the development of manufacturing, the fundamental handicaps confronting the region also lead them to recommend actions well beyond economists' usual policy prescriptions. They note that current scientific efforts to solve Africa's health, agricultural, and environmental problems are woefully inadequate and urge that aid programs redirect resources to these less conventional but currently crucial activities. And they conclude that shifting the orientation of economists and supporting institutions toward the roles of geog-

raphy, demography, and health constitutes a necessary step in devising more effective approaches to Africa's development challenges.

AS UNEMPLOYMENT FELL to 6 percent during 1994, most analysts were already warning that the U.S. economy had reached its NAIRU—the unemployment rate at which inflation remains stable. According to the NAIRU model, if policymakers permitted unemployment to fall further, rising inflation would eventually require a painful recession to bring it under control. Four years later, economic expansion has reduced the unemployment rate to 4½ percent, and the broad price indexes show the lowest inflation rates in more than thirty years. This performance has increased criticism of the NAIRU framework by its detractors and intensified its supporters' efforts to interpret recent developments within the framework. In the second report of this issue, Robert Gordon, who has used a NAIRU model to explain inflation for the past two decades, provides a detailed interpretation of recent developments. He examines the economy's price performance, allowing for special factors that have impacted the major price indexes, and for the possibility that the NAIRU has recently declined.

Gordon's econometric estimates incorporate three main determinants of inflation: First, either negative or positive levels of excess aggregate demand, measured by the gap between the actual unemployment rate and the NAIRU. Second, supply shocks, measured by changes in the relative price of imports and the relative price of food and energy. And third, the effects of past inflation on current price-setting, measured by lags of past inflation rates. By assuming that the sum of coefficients on the lagged inflation rates equals unity, which Gordon finds approximately consistent with freely estimated coefficient values, the inflation equation provides an estimate of the NAIRU.

Until recently, Gordon had found that assuming a constant NAIRU provided an adequate fit to the data. However, such an equation substantially overpredicts price inflation in recent quarters. To explore this favorable recent experience, Gordon allows for the possibility that the NAIRU varies with time, using an estimating technique developed by James Stock and Mark Watson. In regressions for each of three broad price measures—the GDP deflator, the personal consumption expenditure deflator, and the Consumer Price Index—the time paths for the three estimated NAIRUs differ only moderately from each other, and

all have declined substantially, from around 6¼ percent in the late 1980s to between 5.3 and 5.7 percent in mid-1998. While part of this decline is left unexplained, another part is explained by three factors that have held down measured price indexes in this period, and thus reduced the estimated NAIRUs using Gordon's framework: rapid quality improvements in computers, an abrupt slowdown in medical care inflation, and changes in the methodology used to calculate price indexes.

The estimated declines in NAIRUs have still left actual unemployment rates well below the NAIRU for the past two to three years, yet price inflation is stable or declining by all three measures. According to Gordon, one reason is that supply shocks explain an important part of recent price performance. Allowing for their effects reduces the amount of favorable price surprise left to be accounted for by a declining NAIRU. Gordon notes that his estimating technique employs a smoothing parameter to control how abruptly the estimated NAIRUs change, and his results are sensitive to the value chosen for this parameter. His preferred estimates allow only gradual changes in the NAIRU. Permitting more rapid changes would yield lower estimates of the current NAIRU and explain more of the favorable inflation surprise at the end of the period, but at the cost of permitting more abrupt, and seemingly unrealistic, changes in earlier years.

Gordon quantifies the amount of the inflation surprise for the GDP deflator for 1998:2 that can be accounted for by each of the developments he identifies. He measures the inflation surprise as the prediction error from an equation estimated through 1992:4, with a constant 6 percent NAIRU and with the relative price of imports, food, and energy held constant. All results refer to the four quarters ending in 1998:2, when the deflator rose by 1.0 percentage point, or 2.7 percentage points higher than predicted. Of this surprise, Gordon's supply shocks—the relative price declines in food, energy, and imports—explain 1.4 points. The estimated decline of the NAIRU accounts for 0.5 point, with about half of the decline unexplained and half accounted for by the special factors—quality improvement, medical care costs, and methodology—that held down the price indexes. Finally, 0.8 point of the inflation surprise is left unexplained. Gordon notes that this allocation of the inflation surprise is sensitive to how he treats these special factors. Over the past decade, the special factors directly sub-

tracted 0.74 point from the inflation rate in the GDP deflator, though they account for only 0.25 point of the inflation surprise through their estimated lowering of the NAIRU in the decomposition above.

Unemployment is an imperfect proxy for aggregate excess demand and many observers look to the behavior of wages as well as prices to understand the inflation process. When Gordon expands his analysis to address these two issues, he finds important differences from the results using his basic model. Capacity utilization (in manufacturing, mining, and utilities) has not risen in pace with the decline in unemployment, and actual utilization has been below the estimated noninflationary utilization rate in recent years. When he substitutes capacity utilization for unemployment as the demand measure in his model, he estimates little change in this noninflationary rate. Unfortunately, there is little statistical basis for choosing between unemployment and capacity utilization as reliable indicators of inflationary pressures.

Broad measures of hourly labor costs have not decelerated along with the major price indexes in recent years. The annual increase in the Employment Cost Index (ECI) for total compensation barely changed over this period, as the cost of medical fringe benefits slowed. The ECI for wages and salaries, the most reliable gauge of wage inflation, actually accelerated, rising 3.9 percent in the year ending 1998:2, compared with 3.1 percent four years earlier. As a consequence, rather than declining after the late 1980s, as have each of the NAIRUs estimated from price data, the NAIRU estimated for ECI wages and salaries has risen to around 6½ percent.

Although Gordon accounts for most of the surprise in price inflation in recent years through a declining NAIRU, supply shocks, and special factors, some of the inflation slowdown remains to be accounted for. But Gordon is not persuaded by other explanations that have been offered. He questions the "new economy" view that unmeasured effects of high-technology innovation have held down inflation. He notes that such effects should have boosted measured productivity by the same amount as they held down measured inflation, but no such productivity surprise is in the data. He also notes that the argument that official price indexes miss some of the benefits of innovation cannot explain the surprising deceleration in those official indexes.

Gordon's analysis provides a helpful decomposition of recent inflation surprises but also leaves important issues unresolved. He points to

the different NAIRUs estimated for wages and prices and to the different estimates provided by unemployment and capacity utilization as the two main puzzles. The different NAIRUs for wages and prices imply continually accelerating wages alongside continually decelerating prices whenever unemployment is between the two. He does not get rid of this puzzle by modifying his price model to include wage costs, because he finds little role for wage costs as a separate factor in explaining price inflation. If the unemployment rate is to be a reliable guide for stabilization policy, many of the questions that Gordon's analysis raises will need better answers than are now available.

THE JAPANESE ECONOMY has been in a slump throughout the 1990s. In recent quarters, following two aborted spurts of recovery, the situation has deteriorated from a growth recession to a steep decline that has also contributed to recessions and financial crises in other Pacific Rim economies. Japan's macroeconomic problems have been accompanied by sharp drops in real estate values and stock prices, which have eroded the capital position of its banks. These financial problems have intensified with the continuing declines in production and employment and threaten the macroeconomy with a credit crunch, on top of the weakness in aggregate demand. Observers in the United States and elsewhere have been frustrated and baffled by the inadequate response of Japanese officials to these substantial problems. In the second report in this issue, Edward Lincoln provides a historical perspective on the Japanese financial system and relates it to the origins of the present crisis and the prospects for the Japanese economy.

Analysts accustomed to the institutional frameworks of other advanced industrial nations have had trouble understanding the workings of the Japanese banking system and the paralysis of officials in dealing with the banking crisis. Lincoln sees the origins of the present problem in the design of the postwar financial system, which was part of an overall plan that gave government unusual power to guide the economy. That design minimized the role of stock and bond markets, which would have responded to market forces to allocate capital, and relied instead on banks and insurance companies that could readily be influenced by the Ministry of Finance (MOF). In exchange for protected markets and almost assured profitability, these industries became vehicles for credit allocation by the MOF.

Lincoln observes that the central position assigned to bank lending, which depended on personal relationships and confidential rather than public information flows, was well suited to the way Japanese society worked. It also came to complement the *keiretsu* (enterprise group) relationships around which most industrial activity was organized, with "main banks" providing corporate oversight. In the high-growth years of the early postwar period, this bank-centered system did a good job of matching savers with investors in Japan, although it led to dangerously high debt-to-equity ratios throughout the corporate sector and especially in banking. Lincoln argues that the combination of international capital controls, the government's willingness to defend the currency, and the absence of other countries pursuing the same strategy shielded Japan during this period from the kinds of serious problems that recently befell South Korea. But, in his analysis, when economic growth slowed after 1973, the environment for bank lending gradually changed, sowing the seeds of the crisis of the 1990s.

Slower growth led to a chronic excess of desired saving over domestic investment and rising pressure for deregulation from banks, which needed to broaden their activities to maintain profitability. In the 1980s, accommodated by the MOF's regulatory changes, banks significantly expanded their activities in real estate and international lending. Lincoln reports that total bank lending grew a little faster in this decade than in the last half of the 1970s, with the growth concentrated in the two new areas. By the second half of the 1980s, lending to manufacturing was stagnant. He notes that the new areas of lending were much riskier than the banks' traditional business, in part because the banks were in unfamiliar markets and continued to rely on strong personal relationships without paying adequate attention to financial analysis. In addition, having prospered in an environment sheltered from entry, Japanese banks continued to believe in an implicit guarantee of profit from the MOF. Their complacency was encouraged by the continuing large inflow of funds from the public and by their own high profits.

The enormous appreciation of the yen that began in 1985 eventually led the MOF to ease monetary policy, a move that avoided recession and maintained rapid real growth. But Lincoln notes that with little demand for loans to manufacturing firms, lending for real estate and stock market investments soared. Both stock prices and urban real estate prices tripled in a few years and banks used inflated real estate values

as collateral for a wide range of loans. When the bubbles in stocks and real estate finally burst, prices crashed back to 1985 levels, leaving mountains of bad debts in their wake.

The size of the bad debt problem is notoriously hard to pin down because of the lax reporting requirements for banks in Japan. Lincoln reports that MOF estimates escalated from ¥28 trillion in fall 1997 to ¥77 trillion a few months later, and that in summer 1998 the Financial Supervisory Agency, which was spun off from the MOF, revised up the total to ¥123. This last estimate, about one-quarter of which comprises loans that have already been declared bad, amounts to 25 percent of GDP. The losses of insurance companies and securities firms are not included in these figures.

Perhaps more disturbing than the size of the bad debt problem are the examples of unethical and illegal behavior in the financial system. Lincoln notes that favored investors, including politicians and bureaucrats, were assured high returns on their equity investments. Huge loans went to small business for speculation in stocks and real estate. Corporations paid off racketeers who threatened to reveal embarrassing information. MOF officials warned banks of upcoming "surprise" inspections and performed only perfunctory examinations. In Lincoln's words, such "scandals paint a picture of widespread routine corruption and incestuous relations among financial firms, their clients, government officials, and politicians."

If the banking crisis reflected unexpected shocks to a well-functioning system, a policy aimed solely at clearing up balance sheets would seem appropriate. But in light of the scandals he identifies, Lincoln argues that harsh remedies are needed: closing institutions or, for those that appear salvageable, removing management. He further observes that progress has been difficult because of the complicity of the Ministry of Finance, "condoning, encouraging, or even recommending unethical and illegal actions," and the resistance of politically powerful business leaders who have benefited from the present system and fear change.

The government's response to both the economic slump and the banking problem has included fiscal stimulus, along with some direct efforts to bail out troubled banks. Seven stimulus packages were announced between 1992 and 1995, although "the amount of stimulus actually provided was considerably less than originally announced." Some packages contain measures that have no effect on the govern-

ment's fiscal balance, and some merely supplement an initial budget that may have been very restrictive. Using estimates by Adam Posen, Lincoln shows that announced stimulus packages over this period totaled 12 percent of GDP, whereas the ex post actual stimulus totaled only one-third that amount. Still, Lincoln regards this stimulus as meaningful and credits it with helping the economy to recover briefly. But he notes that fiscal policy was perversely tightened in early 1997, when an income tax cut was allowed to expire and the nationwide sales tax was raised. The economic slump has deepened sharply since then, exacerbating the banking crisis.

The government's latest plan to deal with the crisis was unveiled in the summer of 1998. It created a secondary market for securitized bad loans, tightened accounting rules, created the Financial Supervisory Agency as a split-off from the MOF to strengthen bank supervision, and most important, established a "bridge bank" system for handling failed banks. Under that system, if an acquisition cannot be arranged for a failed bank, it will become a bridge bank under government control. It will receive new capital from the government and can continue to make loans to "sound" borrowers, dispose of bad loans, and seek buyers for its remaining assets. Lincoln applauds this new initiative but also points to potential problems with its implementation. First, because the concept of a failed bank is ill defined, it is unclear whether the plan will actually eliminate irresponsible institutions and their managers rather than keeping existing institutions afloat. Second, in allowing the continuation of sound loans, the new program may maintain the flow of credit to traditional borrowers who are not creditworthy, especially if they are politically well connected. Third, the timetable for shutting down failed banks is uncertain, suggesting that the program may be used to delay needed restructuring.

Lincoln discusses other recent developments that he regards as positive for the longer run. Firms are issuing more bonds, which indicates that the financial system is starting to move away from excessive reliance on loan finance. And the government appears to be overcoming its antipathy toward foreign firms, welcoming them into the market for securitized bad debt and permitting them to acquire equity interests in Japanese financial firms. However, Lincoln remains guarded about the immediate future, concluding that the problems of the Japanese economy and financial system are far from over.