Knowledge for Development
Economic Science, Economic Policy, and Economic Advice

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At this conference last year, and during the following year, I have tried to set out a vision of a development agenda that embraces broader objectives and more instruments than have often been the focus of development efforts of the past. I stressed that we are concerned not just with increasing GDP, but also with improving living standards, which includes better health and education. We need sustainable development, not only in the standard sense of protecting the environment for future generations but also in the sense of being rooted in policies that can withstand the vicissitudes of the political process. We need egalitarian development, in which the fruits of the growing prosperity are shared widely within the population. And finally, I argued that we need democratic development, in which citizens participate meaningfully in those collective decisions that affect their lives and livelihoods in so many ways.

To accomplish these goals, I argued that we need to go beyond the kinds of policies that, for want of a better term, I will refer to as the neoliberal model.¹ The neoliberal model accords the government a minimal role, essentially one of ensuring macroeconomic stability, with an emphasis on price stability, while getting out of the way to allow trade liberalization, privatization, and getting the prices right. Many of these policies are necessary for markets to work well and contribute to economic success, but they are far from sufficient. Some aspects of the neoliberal model might not even be necessary conditions for strong growth, and if undertaken without accompanying measures, say to ensure competition in relevant areas of the economy, they may not bring many gains and could even lead to setbacks. Some countries have closely
followed the dictates of the neoliberal model, but have not seen especially strong economic performance. Other countries have ignored many of the dictates—at least with respect to the crucial details of sequencing—and have experienced among the highest rates of sustained growth the world has ever seen.\textsuperscript{ii}

In their zeal to get countries to adopt the policies recommended by the neoliberal model, some of its more ardent supporters often turned what should have been simply a means into ends in themselves. There is, for instance, a growing consensus that a vibrant market economy should be the center of a successful development strategy, and that this in turn requires effective incentives, which depend on well-defined property rights and strong competition. Privatization and trade liberalization have often been employed as means toward achieving these ends, but we should not forget that complementary reforms may be needed. Turning a state monopoly into a private monopoly, for instance, is unlikely to help create a more dynamic market economy.

China had shown that an economy might achieve more effective growth by focusing first on competition, leaving privatization until later. Although in 1978 China accounted for only 40 percent of the population of low-income countries and one-quarter of their GDP, since that time two-thirds of the aggregate increase in GDP for low-income economies has been in China. If the 30 provinces of China—many of which are larger than all but the largest of the developing countries—were treated as separate countries, then the 20 fastest growing economies in the last two decades would all have been Chinese provinces (World Bank 1997).

In contrast, competition remains thwarted in many of the former socialist economies that pursued privatization first. The improved incentives associated with privatization and the elimination of distortions associated with central planning should have led to increased efficiency of resource allocation, and thereby increased GDP. But according to the official statistics the
“successful” countries in Eastern Europe have the same per capita GDP they had in 1989 and Russia has seen its average income cut in half since 1989.iii And at least one of the countries in the region has demonstrated that without an effective legal structure, private rent seeking can be every bit as powerful, and perhaps even more distortionary, than public rent seeking.

Another theme of not only my recent research,iv but also a vast amount of work on the microeconomic foundations of macroeconomics over the past 15 years,v has been the importance of understanding the links between financial markets and the real economy, and the key role that financial markets play in promoting economic growth and affecting economic stability. This research was not motivated by the recent wave of financial crises, and it certainly was not prescience of the impending turmoil in East Asia. Rather, it was based on more fundamental developments in economic theory and empirics over the past 25 years, such as those in the areas of incomplete information and incomplete markets. This strand of the literature stands in marked contrast to new classical and real business cycle models whose microfoundations are based on assumptions of representative agents, complete markets, perfect competition and market clearing (so there is neither unemployment nor credit rationing), and complete rationality.vi As questionable as those models might be for an advanced industrial economy, they are clearly not appropriate for developing countries, which are our focus here.

These were some of the themes I raised in my keynote address last year and over the course of the following year. I would like to use my remarks today to reflect on one of these areas that has traditionally received insufficient attention: the role of knowledge and information in development. I will begin by discussing the role played in development by knowledge, including technical advances like invention of the telegraph or the discovery of a vaccine for smallpox, and asymmetric knowledge, about, for instance, the profitability of an investment project.
Economic ideas—knowledge about economics—have had a similarly profound effect on the lives of billions of people, making it absolutely essential that we do our best to try to understand the scientific basis for our theories and evidence. Today, I will illustrate this by discussing the economic ideas in three areas: the causes of and responses to the East Asian crisis, financial liberalization, and privatization.

In practice, however, there are often large differences in the understanding of or beliefs about economic issues. The purpose of economic science is to narrow these differences by subjecting the positions and beliefs to rigorous analysis, statistical tests, and vigorous debate. Most economists agree that the outcome of the process should not be dependent on the values of the participants in the debate. In practice, however, it is not uncommon to find, for instance, that a researcher of libertarian leanings will uncover evidence that large governments are bad for growth. As long as there is uncertainty, and there will always be uncertainty, it will be impossible to fully separate values from purely scientific discussions. Once we accept this conclusion, we realize that in giving advice we are not just purveying economic science. This requires us to think seriously about how we give advice and what incentives shape the advice we give. This is the subject of the last sections of my talk.

**The Role of Knowledge and Scientific Methodology**

This year’s *World Development Report*, subtitled *Knowledge and Information for Development* (World Bank forthcoming b), concerns two major themes. First, one of the major ways in which less developed countries are separated from more developed countries is by their level of knowledge. Successful development thus entails not only closing the gap in physical or even
human capital, but also closing the gap in knowledge. That is why the World Bank is increasingly thinking of itself as a Knowledge Bank, not just a bank for facilitating the transfer of capital to developing countries. It is not just knowledge of production processes that matters; good institutions and policies are an essential ingredient of successful development efforts. One feature of good institutions and policies is that they not only facilitate the transfer of knowledge, but also enhance the likelihood that such knowledge will be used effectively.

The second theme of the World Development Report is that imperfections of information impede the workings of markets. Traditional models assuming perfect information may not provide a good approximation for understanding land, labor, product, and capital markets. They fail to explain essential parts of the institutional structure and performance of all economies, and these shortcomings are especially important in developing countries, which suffer from an even greater lack of information. Effective development strategies must take into account these limitations in striving to improve the functioning of markets.

Many have described the current state of the world as a knowledge revolution, an acceleration in the pace of the generation of new ideas and of the decline in the cost of disseminating these ideas. The recognition of the centrality of knowledge itself is an important development, perhaps a revolution in its own right. The knowledge revolution and our changed perspectives of the role of knowledge in development have opened up new opportunities: remote villages can be interconnected through the Internet and have access to a knowledge base beyond the dreams of anyone living a century ago. Distance education can bring the finest teachers in the world to countries around the globe. But the knowledge revolution has also brought new challenges: those without access to these resources and the knowledge and training to use them may fall even further behind.
This knowledge revolution is based on modern science and technology, and the change in modes of thinking that modern science brings with it constitutes one of the major aspects of the development process. The scientific mentality does not just accept traditions and received wisdom. It questions beliefs, asking, what is the evidence? And how do we know what we believe? Once one begins to question traditional beliefs, change is inevitable. The scientific process itself is one of constant change, and one idea leads to another, often challenging the previous one as new evidence overturns existing hypotheses and beliefs. Science is thus necessarily iconoclastic, and unsettling.

Science also recognizes its limitations. Uncertainty is endemic, and science attempts to be precise about the degree of uncertainty associated with each statement. It does not pretend to assert with confidence what it only believes on the basis of partial information. The recognition of this uncertainty counsels humility, especially when those supposedly with scientific knowledge apply their imperfect knowledge to real world situations affecting millions of individuals.

Even in the most advanced industrial countries, the scientific approach has made only limited inroads. Any reader of management textbooks is well aware that a substantial fraction of the nostrums, as plausible and reasonable as they may be, are not based on scientific evidence. One highly popular book touted its formula for success by showing the role it had played in the success of 43 of America’s most successful enterprises; yet just a few years later, the performance of these highly praised companies was little if any better than those of a randomly selected list. To those not committed to the scientific approach, these experiences are hardly a setback: the author was quickly back in the market with a new formula for success—and new speaker’s fees—to explain the new approach to managerial success. Those who eschew the
scientific methodology are ready with a thousand and one explanations for the failure of their predictions, many of them reminiscent of the explanations used by medieval doctors engaged in bloodletting: the patient did not precisely follow the prescription, she went off the regimen too early, or the disease would have been even worse without the medicine.

Unfortunately, economics provides few opportunities for the controlled experiments that characterize much of modern science. In this sense, it is much like astronomy, left to make inferences from the natural experiments that nature from time to time affords. But it is at an even more disadvantaged position: while astronomers observe a universe governed by unchanging laws, much of economics is concerned with the behavior and responses within today’s economy; and today’s economy differs from that of yesterday, and certainly from that of a half century or a century ago. To what extent are those differences salient for making inferences and predictions relevant for today? Worse still, the multiplicity of factors that affect outcomes and the few truly exogenous variables mean that economists are almost always dealing with underidentified systems. These problems are compounded when we are dealing with economic crises, which fortunately are relatively infrequent. (I am not recommending that we solve this problem by increasing the frequency of crises, as helpful as that would be to economic researchers!)

But modern science is, fortunately, richer and draws upon sounder bases than simply making inferences from, say, mindless cross-country regressions. Newton’s inferences about the existence of the force of gravity and the fact that it varies inversely with the square of distance were based not on a statistical regression, but on a careful analysis of the implication of that simple hypothesis for the nature of planetary orbits. A single, striking observation can overthrow a theory (though to be sure, there are always those who strive to make Ptolemaic revisions to existing theories to preserve existing doctrines). The Great Depression served to overthrow
classical economics, which was predicated on the assumption that all markets, including the labor market, clear. Although some today see the reduced employment that occurred in the Great Depression simply as a decision by large numbers of labor market participants to increase their enjoyment of leisure, there are enough pieces of evidence against that hypothesis that it has won few adherents outside a few American universities.

Thus, in making inferences about economies, we bring to bear a wealth of information, theory, statistics, econometrics, and historical experience. We weed out hypotheses through natural experiments or by pointing out their intellectual inconsistencies. Reasonable people may, of course, differ in how they aggregate all these disparate pieces of information, a point to which I will return later. Worse still, the question is often whether a particular model is “good enough” for the question being addressed. Today, almost everyone accepts the premise that macroeconomics must be built up from microeconomic foundations, and that the assumptions involved in precise aggregation are heroic. Everyone knows that information is imperfect, and we even know today that even slight changes in information assumptions can have major consequences (see Stiglitz 1985). We all know that financial markets, which are essentially concerned with addressing information problems—with ascertaining the most productive uses to which to put scarce capital and monitoring to ensure that the funds are used well—may be characterized by important imperfections (which themselves can be explained by information imperfections). These imperfections affect the performance of financial markets and the economy in vital ways and necessitate an important role for government, a topic that was the subject of my contribution to the Annual Bank Conference on Development Economics in 1993 (Stiglitz 1994a). We all know that with imperfect information and incomplete markets, there is no presumption that even competitive economies will be constrained Pareto efficient (Greenwald
and Stiglitz 1986) and we all know that it is unlikely that such markets will be fully competitive (see Salop 1976; Salop and Stiglitz 1977; and Stiglitz 1989b). We also know that there is considerable heterogeneity in the population, and that various actors may act in quite different ways—a domestic investor in Indonesia may not respond in the same way to even the same signals as an investor in New York. But while there may be little disagreement with these general propositions, their application may give rise to controversy. All models represent simplifications. The proper and often difficult question is, when will a particular simplification provide the key insights, and when will it lead to misleading policy positions?

In the past, economic arguments were over very big questions. Adam Smith’s revolutionary idea that the wealth of nations was measured by its income, not its gold reserves, helped bring an end to mercantilism (although mercantilist notions still seem to guide many popular fears about trade deficits). David Ricardo’s principle of comparative advantage helped end the Corn Laws. And Karl Marx’s ideas provided the intellectual basis for an economic system that until recently dominated the lives of 1.6 billion people. To be sure, interests also played a key role in these developments and, as I will discuss later, ideas and interests are inextricably intertwined.

Today, the grand ideological battles are over. In most countries, there is almost universal agreement that markets should be at the center of any vital economy. And few would doubt that governments should play an important role as a complement to markets, through competition policy, regulation, funding for education, and support for research and development, to name just a few vital roles for government.

Within this broad agreement, however, are continuing debates over more technical matters, such as how to respond to economic crises, how to undertake financial reform, and what
is the proper scope and sequencing of privatization. These debates too can have a huge effect on
the lives of people throughout the world. I turn to these subjects next.

**Applied Economic Knowledge I: Causes of and Responses to the East Asian Crisis**

Most of the governments in East Asia and their advisers, both formal and informal, share the
same goal: the speedy resumption of stability and growth in the region. The recommended means
for achieving this goal, however, have sometimes differed. To some degree, this mirrors the
different beliefs, values, and interests of the participants in these discussions. The solutions
proposed by, for instance, a worker and a banker will often be based on different objectives. The
influence of these factors on a problem of analyzing a phenomenon as complex as the East Asian
crisis is evidenced by the close link between *diagnosis* and *prescription*. For instance, those who
believe on ideological grounds that government should play a smaller role in the economy put
greater emphasis on excessive government interventions, not on the lack of government
regulation in the financial sector. There is a certain irony in these positions: not long ago, these
same critics were claiming that the government played little role in the economy; the remarkable
growth of these economies was largely attributable to the fact that the government did not
intervene.

The difference between economic science and ideology is that such assertions can be
subjected to rational inquiry: The arguments must past tests of internal consistency. If $x$ is
proposed as *the cause* or even as a primary cause of a particular form of crisis, then it should be
the case that countries that have $x$ will have the crisis and those without $x$ will not.$^{xiv}$ Since the
East Asian countries had not suffered major crises prior to last year,$^{xv}$ those asserting that
government intervention is at the root of the problem must show either that government behavior (or the role of government) changed or that circumstances changed in ways that made behaviors that were growth-enhancing in the past no longer productive. And anecdotes do not constitute proof: stories about Charles Keating and the Keating 5 are no more proof of crony capitalism being at the root of the U.S. savings and loan crisis of the 1980s than are similar stories from East Asia.

Analytic arguments and empirical evidence are required. Regrettably, in the specific context of East Asia, these remain in short supply. In the last decades, we have witnessed myriad examples of the bursting of real estate bubbles—of the kind seen in Thailand—giving rise to financial and currency crises. Each such bubble has its own anecdotes, its own personality; with each, we draw additional lessons. This unfortunate wealth of experience has reinforced our burgeoning understanding of the dynamics of asset markets and the links between financial and real markets. This understanding can go a long way in helping us grapple with the crisis.

Yet, normally, we do not move beyond this to a blanket condemnation of the economy. We do not invoke charges of political cronyism, trade distortions, or lack of transparency to understand the other real estate bubbles. Occam’s razor suggests that we not do so, say, in Thailand unless these features resulted in a crisis that was in fundamental ways distinctive from those elsewhere.

My intent in this talk is not to resolve these issues, but rather to illustrate how some assertions that have become almost commonplace in the discussions over the East Asian crisis need to be subjected to closer scrutiny. Because the links between diagnosis and policy are so close, we should be especially demanding on ourselves, especially wary that we not confuse ideology with economic science.
The “Asian Model,” Economic Distortions, and the Causes of the Crisis

The recent crisis in East Asia provides ample examples of these difficulties. By now, economists have joined journalists in describing key attributes of these economies that they claim contributed to the current problems: misguided investment, weak financial sectors, lack of transparency, inadequate corporate governance, inappropriate exchange rate policies, and so on and so forth. Lip service is now universally paid to the fact that the current crisis differs markedly from earlier crises: it is private sector debt, especially short-term debt, not public sector profligacy that was at the root of the problem; the countries in East Asia had low inflation and a fiscal stance and public-debt-to-GDP ratios that were the envy of even the most responsible industrial economies.

But such lists of factors do not constitute a causal analysis. Many of the listed factors are neither necessary nor sufficient for a crisis. Some countries with less transparency, more political cronyism, weaker financial systems, and larger fiscal deficits not only avoided a crisis, but were also relatively unaffected by contagion. In the past we have seen countries with high degrees of transparency go through major financial crises, most notably the Scandinavian countries in the late 1980s and early 1990s.xvi

And the connection of some factors that are often listed as contributing to the crisis is at best unproved and at worst tenuous. A consensus holds that the success of the East Asian economies was based on their willingness to compete effectively in international markets. But today some people have blamed the crisis on the lack of openness to international trade and investment, and have sought solutions to the crisis in pushing the East Asian countries to further open their markets. Import restrictions and other forms of government protections, including
barriers to competition, do lower a country’s overall standard of living—and this is as true in the United States as it is in East Asia or any other region in the world. Eliminating them would clearly be good for long-run productivity and might even lessen the likelihood of future economic crises. But we should not fall into the post hoc ergo propter hoc fallacy of identifying any problem as a cause of this crisis. After all, would anyone suggest that the United States’ distorted agricultural sector played a significant role in its savings and loan crisis of the 1980s?

Even if serious distortions contributed to the vulnerability that resulted in the crisis in East Asia, it does not necessarily follow that eliminating them is the correct way to respond to the immediate crisis. If the United States had removed agricultural subsidies in the midst of the savings and loan crisis, the result would have been plummeting land prices, exacerbating the burst of the real estate bubble and thus worsening the financial crisis. By the same token, eliminating the huge energy subsidies embedded in the U.S. tax code would be good for both the environment and the economy, but to have eliminated these distortions in the midst of the financial sector problems in Texas in the mid-1980s would have been, to say the least, foolish. The crises in Scandinavia illustrate similar issues. In Sweden, for instance, the elimination of distortions favoring debt in the tax system, after a period of large-scale debt buildup, was one of the important factors contributing to the financial crisis in the early 1990s (see Bäckström 1997).

To be sure, a weaker economy, in any dimension, can contribute to a weakening of the financial sector. Policy analysts must ask two questions: To what extent does a particular distortion lead to the particular problem being addressed? And to what extent will the elimination of that distortion lead to the resolution of that particular problem?

The first question is not easy, because it calls for quantitative, not just qualitative analyses. For instance, on balance, there is no reason to believe that these distortions, the system
of government-business cooperation—the much heralded Japan, Inc. or Malaysia Inc., which have suddenly been recharacterized as crony capitalism—and the system of financial institutions led to massive misallocations of investment. Indeed, there is a large scholarly literature that while recognizing the dangers of abuses, came to the judgment that overall the system worked well.xvii Certainly, for three decades it delivered the most impressive level of increases in GDP that have ever been attained in such a short span of time. The fruits of that progress have been widely shared, as reflected in the impressive poverty reduction, rising literacy rates, and expanding life expectancies. These increases were far more impressive than those delivered in any major country following solely the prescriptions of the neoliberal model. On balance, while there may well have been resource misallocations, evidently these were small costs outweighed by the real gains. Would the East Asian economies have done even better had they adopted an alternative system? This is a relevant question, a counterfactual that needs to be looked into and will be the basis of speculation by ideologues, but there is little evidence to support such a conjecture. There is, however, an intriguing issue: whatever the historical record, circumstances change. Was the current turmoil the result of a changed balance between the advantages and disadvantages of the “system”? Or was it that the system was well suited for one environment, but not for the new world of globalization? Or did they in fact change their system, in response to outside pressure for financial market liberalization, for instance, undermining a system that was relatively well tuned, and imposing stresses to which it could not or did not adopt?

While elsewhere (Stiglitz 1998) I have set forth my own views on the answers to these questions, my point here is to emphasize the importance of research, and the imperative of separating solid research—deep analysis—from economic journalism. To back up an assertion that there were systemic problems, one should show that there were systemic consequences in
terms of a slowdown in, say, total factor productivity growth. The prevalence of bad loans, even bad loans to a particular sector, is neither necessary nor sufficient evidence that government pressures led to bad lending decisions or that there were misguided resource allocation decisions. The U.S. government did not direct U.S. banks to make bad real estate loans, though inadequate government actions (high interest rates leading to a devastation of the balance sheets of U.S. savings and loan companies, followed by regulatory forbearance, including nontransparent accounting tricks) surely contributed to the problem. Excessive leverage may result in even investments in projects with very high expected returns going sour after an unanticipated rise in interest rates.

But even if a particular misguided policy has contributed in an important way to a problem, it does not mean that the elimination of the distortion will lead to its resolution, as the examples I gave earlier in describing the distortionary agricultural and energy policies in the United States should have made clear.

*Interest Rates, Exchange Rates, and the Restoration of Confidence*

Let me focus now more narrowly on what is generally agreed upon as the central issue—the financial crisis. The questions of the causes and consequences of financial crises have been extensively studied during the past 15 years. And that research itself is based on our understanding of financial markets and the role they played in the economy. I cannot review that vast literature here, but let me list a few of the more salient findings, insights that are potentially of relevance to the current situation:
• Financial markets play a key role in allocating resources and monitoring that those resources are used well; they have been likened to the brain of the economy. These are quintessential information roles, so that the caveats about market imperfections and the limited applicability of the standard welfare theorems are particularly relevant.

• The recognition that there is a probability that loans will not be repaid is essential to understanding credit markets. If there were no concern about loans being repaid, then of course there would have been no hesitancy by foreign banks in rolling over their loans to Korea or Indonesia.

• The probability of being repaid is an endogenous variable, affected by the overall state of the economy and the interest rate charged. Raising interest rates may lower the probability of being repaid, both because it induces actions by the borrower that lower the repayment probability (for example, more risk taking) and because it may weaken the macroeconomy.

• Lenders care not about the nominal interest rate, but about the certainty equivalent expected return. Raising the nominal interest rate may lower the certainty equivalent expected return both by increasing the probability of not being repaid and by increasing the risk premium.

• These effects can be of sufficient importance that in markets, lenders would actually choose not to increase the interest rates charged even when there is an excess demand for loans. This may give rise to credit rationing. xviii

• The extent of credit availability may be adversely affected by bank closures, which result in the destruction of relevant informational capital, as well as by any increase in uncertainty and by decreases in bank net worth, the consequences of rapid increases in interest rates and rapid deterioration of the overall level of economic activity.
• General equilibrium “credit links” can be every bit as important as general equilibrium interactions through goods and services emphasized in traditional general equilibrium theory. In a market economy, most firms are engaged not only in production, but in credit activities, with suppliers as well as customers. Breakdowns anywhere in the system can have large systemic effects.

• Different suppliers of capital may differ markedly both in their beliefs and in their willingness to bear risks. Accordingly, responses—say, to actions of the government—may differ markedly. There may be a flight of domestic capital, before or even as foreign capital enters.

It is clear that these well-accepted principles of modern macroeconomics and finance are essential for understanding the crisis in East Asia. Their policy implications are apparent: raising interest rates might not lead to an increased flow of capital into a country; it could have exactly the opposite effect. Thus, although countries confronted with an exchange rate crisis have sometimes viewed themselves as facing a tradeoff between adverse effects of exchange rate depreciation and interest rate increases, if increases in interest rates lead to a decreased capital flow, there is no tradeoff: higher interest rates weaken the economy directly, and can actually exacerbate the decline in the exchange rate.

The effect of high interest rates on the exchange rate is an empirical issue, although one about which historical and cross-country experience may shed only limited light. In normal times, conventional theories have not fared very well. One of the most basic building blocks of any exchange rate theory, uncovered interest parity, has been rejected by most empirical tests, which have found, if anything, that a positive interest rate differential is associated with an
appreciating currency. Another standard finding in the literature is that it is impossible to reject the hypothesis that exchange rates follow a random walk.

These results, however, concern only “normal” times. What about the relationship between interest rates and exchange rates during crises? One casual observation that this relationship is not more robust than that in normal times is provided by figure 1, which shows the rolling correlations between interest rates and exchange rates in different crisis episodes. The observation that there are periods in which interest rates and exchange rates are negatively correlated, as well as others in which they are positively correlated, is far from conclusive. Clearly, exchange rates and interest rates both are endogenous variables, and thus any correlation could be attributed to the effects of changes related to a third variable. What the evidence does make clear, however, is that assertions that exchange rate recoveries have always been accompanied by or require increases in interest rates have no scientific basis.

Reasoning and evidence may help in resolving the seeming impasse. Those advocating a high interest rate policy typically assert that there will be only minor damage to the economy, because effectively defending the exchange rate requires only temporarily high interest rates. The question then is, why should a temporary increase in the interest rate lead to a permanent shift in the supply curve for capital to a country? After all, in order to defend a currency against the expectation of even a 1 percent fall in the currency the following day, an overnight interest rate of 1 percent per day (which is 3,678 percent per annum) is required, assuming risk neutrality, and for risk-averse investors the interest rate would have to be considerably higher. (To put this in perspective, between July 1, 1997, and April 1, 1998, the Indonesian rupiah declined at a daily rate of 0.6 percent, with some days witnessing declines of as much as 18 percent. An investor
expecting this depreciation would have kept his or her money in Indonesia only in exchange for an almost 500 percent return sustained over nine months.)

**Signaling.** The direct effect of higher interest rates on returns is often not enough to defend a currency, especially when these higher interest rates are only temporary. Instead, the best case for a high interest rate policy is that it leads to a change in a state variable, namely beliefs about, say, the resolve of the monetary authorities to pursue low inflation.\textsuperscript{xxiv} And that beliefs are changed in such a way that when the interventions leading to high interest rates are withdrawn, not only will interest rates fall, but exchange rates will be stabilized at a level higher than they would have been without the intervention.

There is by now a well-developed theory that explains why government interventions might change beliefs. For instance, if the government (or international agencies) have information that is not publicly available, then agents in the economy may make inferences about the underlying state of the economy from the nature of the interventions.\textsuperscript{xxv} Others might well infer that, say, a patient who has been subjected to a strong dose of chemotherapy has been diagnosed not only to have cancer, but also to suffer from a form of cancer that cannot be treated in a more benign way. So too, strong and painful economic actions, especially preemptive actions before signs of a crisis are visible, may be interpreted as signs of serious economic maladies. The actions themselves, of course, given a particular appraisal of the economy, may lead to greater optimism; but whether the combined effect—the change in the appraisal plus the change in actions— is positive or negative is in general ambiguous.\textsuperscript{xxvi} This is especially the case where the efficacy of the remedies will be established only in the long run, while the impact of the reappraisals will be felt immediately. (Much of this literature is based on rational expectations;
but when irrationalities, of the kind that I will discuss shortly, are taken into account, the possible adverse effects become magnified.)

There is little if any research that explicitly models or tests the *positive* effects of temporary high interest rates as a signal about the resolve of a central banker to maintain or strengthen the value of the currency.\textsuperscript{xxvii} This hypothesis can, however, be subjected to theoretical and empirical tests. At a theoretical level, the key question is one of internal consistency: a basic tenet of the theory of signaling is that to be effective, signals must be costly; if it were costless to signal that one were a responsible monetary authority by imposing high interest rates, then everyone would do so, and then high interest rates would not be an effective signaling mechanism. One cannot hold simultaneously to the beliefs that there will not be real, adverse consequences (real costs, at least to some groups within the population) and that high interest rates are an effective signaling mechanism.

There is another aspect of internal consistency of costly signaling mechanisms involving political processes: If the cost is too high, the signal is not credible, because no one will believe that the policy will be sustained (Drazen and Masson 1994).\textsuperscript{xxviii} Even if the current government establishes its credibility, there is overwhelming evidence that economic downturns lead to an increased likelihood of a change in government (see Lewis-Beck 1988 and Paldam 1991). Although in principle an independent monetary authority might insulate monetary policy from such political pressures, at least for a time, even monetary authorities with a long history of independence recognize their vulnerability. If they push too hard, their independence can be taken away. Governors of central banks certainly appreciate this not-so-subtle point. Paul Volcker put this well when, as chairman of the Federal Reserve, he told a Congressional committee that “the Congress created us and the Congress can uncreate us.”\textsuperscript{xxix}
Of course, even if one believed that temporarily high interest rates do have an effect on beliefs, and therefore on the supply curve of capital, one should still ask whether there are less costly signaling mechanisms. Or at least signaling mechanisms that are less costly to innocent bystanders but perhaps more costly to those engaged in risky behavior, and therefore provide better incentives to prevent future crises while restoring confidence in the midst of the current crisis. This is an especially relevant question for international institutions, which may be in a position to help the market coordinate on a signaling system.

The hypothesis that high interest rates are an effective (if costly) signaling mechanism can be subjected to empirical testing. The information contained in the signal would presumably be related to prior information and beliefs. Thus, one would expect a high interest rate policy to be less effective in conveying information about a monetary authority that had a long reputation for responsible monetary policy (as evidenced by low inflation) because the revision in beliefs would presumably be smaller. This strongly suggests that even if one believed in the signaling theory, a high interest rate policy would be less effective in East Asia than it was in Latin America. The subsequent experience of currencies continuing to depreciate after the initial interest rate hikes seems consistent with this hypothesis. But the hypothesis needs further testing, for example, by comparing the magnitude of responses across countries.

Moreover, what conveys information typically is not just the level of the interest rate, but the duration. Indeed, the standard “explanation” for the failure of high interest rates to do their work is that the countries have not “stayed the course.” This too is an empirically testable proposition.

The same mix of theory and evidence can help shed light on another major question: Assume there were a tradeoff, that is, that higher interest rates do in fact lead to higher exchange
rates. The finance-based macroeconomic models make clear that higher (unanticipated) interest rates have adverse effects on the economy; but so too may changes in the exchange rate, especially for debtor countries. The relative importance of the two effects is, of course, an empirical matter. In this case, we do have sound research findings, based on a cross-section of countries: high interest rates have a significant adverse effect—they substantially increase the probability of a financial crisis—while depreciations of currencies have little if any effect (Demirgüç-Kunt and Detragiache 1997).

Such cross-country regressions always need to be taken with a grain of salt; they often entail regressing two endogenous variables against each other; and they often suffer from spurious correlations. But when such regression results are consistent with theoretical models, they may at least bolster our confidence in the relevance of those models. The empirical finding that banking systems are more sensitive to interest rate increases than exchange rate depreciations is consistent with theoretical models. Risk-averse firms have an incentive to hedge themselves against foreign exchange risk and have access to instruments that allow them to do so, at least for short-term exposures. By the same token, risk-averse lenders have an incentive to restrict lending to firms with excessive unhedged currency positions. By contrast, maturity mismatches are endemic in all economies, and the ability to withdraw credit may perform an important role in providing discipline to borrowers, the benefit of which more than offsets the adverse risk effect from the maturity mismatch of assets and liabilities (Rey and Stiglitz 1993). Thus, the observation that on average risks associated with exchange rate changes present less of a threat to financial stability than do interest rate changes is consistent with plausible economic models based on at least a modicum of market rationality.
But even when cross-section results are supported by theoretical models, the results must be applied with care in the case of any particular country. For instance, firms or financial institutions within a particular country may have a very large foreign exchange exposure, suggesting that *if there is a tradeoff between interest rates and exchange rates*, more weight be placed on adverse effects on the exchange rate than would be the case “on average.” On the other hand, in countries like Colombia or Malaysia, where wise central bankers imposed regulations restricting the foreign exchange exposure of financial institutions (and, in the case of Malaysia, the Bank Negara also approves all corporate foreign borrowing on a case-by-case basis), far greater weight should be placed on the disruptive effects of high interest rates.

**MULTIPLE EQUILIBRIA.** The other major set of models providing a *consistent* rationale for higher interest rates as a means of stabilizing the exchange rate are those generating multiple equilibria. Although the results are not in, I am doubtful that these justifications for high interest rates will stand up under close scrutiny. In these models, government intervention can sometimes help coordinate the economy to “choose” the good equilibrium. Having intervened to convince market participants on which equilibrium would prevail, the government can step aside. In principle, anything can serve to coordinate such “sunspot” equilibria; and governments should, presumably, choose coordinating signals that do not themselves have adverse effects, and change the equilibria.

Those who argue for the use of high interest rates thus have a heavy burden: they need to construct the multiple equilibria models; they need to devise convincing tests that high interest rates are indeed serving as the coordinating mechanism; and they need to show that it would be difficult if not impossible to establish less costly coordinating mechanisms. Although the
literature is not replete with convincing models that have satisfied these criteria (to say the least), it is easy to construct multiple equilibrium models, in which government intervention in the form of sufficiently higher interest rates eliminates the “good” equilibrium, with the remaining stable equilibrium being discretely lower.xxxvi

Contagion and the Response to the Crisis

One of the main justifications for international intervention has been worry about contagion—a downturn in one country leading to adverse effects on others. This is a legitimate worry. In any general equilibrium system, all the parts are interconnected. But the worry about contagion is, I take it, more than just the worry that the derivative of one country’s GDP (the “infected” country) with respect to GDP or exchange rates in the crisis country is positive, so that a fall in one country leads to a decline in another. Rather, the worry about contagion is that a large fall in one country will lead to a large decline in another.

Interestingly, most of the focus has been on contagion of financial variables rather than real variables, though to be sure the two are linked. That is, if one thought that what was of primary concern was the real economy, and if one believed that contagion effects were mainly through real variables, then the focus of concern would be maintaining output in the crisis countries, not maintaining currency values or even stock market values. Of course, those variables could still be of concern as intermediate variables to the extent that they affected the real economy.

Empirical evidence suggests that although there are systematic comovements in financial variables, in general, the effects are weak. But one cannot refer to general patterns in crisis
situations: there clearly can be nonlinearities. And even past experience may be a limited guide, given the increased degree of financial market integration. The uncertainty about the significance of contagion effects is thus unlikely to be resolved, at least in the near future.

The current situation provides some insights, precisely because the initial remedies failed to resolve the problems in the countries where the crisis originated. Figure 2 shows the decline in exchange rates; the initial interventions are hardly discernible in the overall patterns of decline. The international effects were relatively minimal until the end of October, when the overall risk premia for loans to emerging markets increased significantly, as shown in figure 3. Evidently, investors’ willingness or ability to bear these risks changed. The fact that emerging markets in general had especially large increases in risk premia suggested that investors perceived greater risks associated with those assets. This is true even though it is hard to see how much new information about Russia or Brazil was revealed by the crisis in East Asia. Instead, what may be at work is Keynes’s beauty contest phenomenon: it is not that the investors themselves perceived greater risks, but they believed that others would, and this by itself would suffice to bring down the market. It is worth noting, however, that the correlations seem strongest in the immediate aftermath of the shock. As time has passed, spreads have come back down in the countries outside of East Asia.

Keynes’s argument about the irrationality of markets—that changes in expectations are, in many ways, inexplicable, so much so that he referred to them as animal spirits—has been one of the most contested hypotheses in economics. Note that Keynes did not argue that markets would not be affected by fundamentals, only that a significant fraction of the movements were inexplicable. Early studies found that it was impossible to reject the hypothesis of the efficiency of markets (see for example Fama 1970). Later work has cast doubt on these results, pointing out
that the power of the tests was very low and even finding evidence of systematic deviations from the fundamentals, including mean reversion (Poterba and Summers 1988) and movements in large stocks leading movements in small stocks (Lo and MacKinlay 1990). Further evidence for the deviation of markets from fundamentals comes from econometric studies showing that the variance of asset prices is substantially greater than can be justified by the stochastic properties of earnings streams and discount rates (see Shiller 1989). Finally, the observation of certain striking events provides convincing support for large deviations from fundamentals, that is, some degree of irrationality. Is there any “news” that could account for the 23 percent decline in the market value of U.S. corporations on October 19, 1987, or the 180 basis point increase in the spread on emerging market debt on October 27, 1997?

If one accepts the irrationality hypothesis, then of course “anything is possible”: it is possible that restoring strength to Thailand will help Brazil. But more broadly, if we cannot explain losses of confidence, how can we be sure about what will restore confidence? And while the irrationality hypothesis argues that there are fluctuations in market values that cannot be explained by “news” of fundamentals, it does not reject all rational analysis. If the reason that Brazil and Russia are suffering is that the East Asian crisis has called attention to the importance of financial fragility, and if addressing financial fragility is viewed as an essential part of the restoration of confidence in Thailand, why should not parallel programs be required by all the countries affected by contagion? Indeed, some have argued that in principle, a bailout motivated by contagion could actually exacerbate the adverse effects in some other countries: if a large financial package is viewed to be essential to address the problems of, say, Mexico, if other countries face similar problems (the basis of rational contagion), and if those other countries are
not likely to get comparable bailouts, then a Bayesian should view the situation in those other countries with more a jaundiced eye.

There are other dilemmas in thinking about the restoration of confidence. Is it plausible that confidence in an economy can be restored, even as the economy plummets into recession, especially if that economic downturn leads to political and social unrest?

Or consider a more technical puzzle: standard theories argue that (ceteris paribus) a reduction in the fiscal deficit depreciates the equilibrium exchange rate.xxxviii If this is true, then is it likely to strengthen today’s exchange rate?xxxix In a world in which beliefs may be irrational, anything is possible, but assertions need to be backed up by relevant evidence—and there’s the rub. Since each crisis differs from previous ones, and, as I have said, we have vast problems of underidentification, the relevance of a particular experience becomes a matter of judgment. For instance, some have pointed to the success of the Mexican bailout as proof of all manner of propositions, including the wisdom of “staying the course.” But Mexico’s problems were in many respects more akin to those of Latin America than to those of East Asia. Although Mexico’s growth had been strong in the years leading up to the crisis, it did not have a decades-long track record of low inflation, fiscal prudence, and strong growth. Moreover, Mexico had a large number of exporters—who had just gained greater access to the lucrative U.S. market—with close ties to U.S. firms (many owned by U.S. companies), and thus the collapse of the domestic credit system would not have the large adverse effects that it would have had in a less fortunate country.
I do not want to give the impression that ideology is the exclusive province of macroeconomists. I could have drawn equally telling examples from microeconomics. Let me illustrate by a brief discussion of two issues, one on the liberalization of financial markets (but from a microeconomic perspective), the other on privatization.

The ideological basis for liberalization of financial markets is a simple one, and could be stated as: “Free and competitive markets are the basis of a capitalist economy, and have delivered enormous fruits to those that have adopted them. There should be no more question about the virtues of liberalization of financial markets than about the liberalization of trade or any other market within the economy.”

Unfortunately, the scientific foundations for this ideological position are not very sound. There are important differences between financial markets and other markets, differences that suggest that although there is a presumption that trade liberalization is welfare-enhancing, liberalization of financial markets may well not be. Empirical evidence, as well as recent experiences in East Asia and Africa, buttress the theoretical propositions that economies can suffer from too little regulation, just as they can suffer from too much or the wrong kind of regulation.

Although my time here is too limited to go through all the details of the argument, the underlying rationale is provided by the general theorem to which I referred earlier, that competitive economies with imperfect information (and incomplete markets) are not constrained Pareto optimal (Greenwald and Stiglitz 1986). A central function of financial markets is providing information—selecting and monitoring projects. Market failures—including those
associated with moral hazard and adverse selection—are thus endemic. Elsewhere, I have provided a taxonomy of these market failures, as well as the appropriate government actions that can help remedy them (Stiglitz 1994a).

Moreover, there are also general results showing that markets characterized by imperfect information are often imperfectly competitive, and imperfectly competitive markets are typically not Pareto efficient. Empirical studies show that even though there may be many banks in the economy (and thus effective competition for deposits), there may be submarkets (for example, loans to small businesses in a particular region of a country) in which competition is very limited. These problems are likely to be particularly severe in developing countries, where information markets are less well developed, and recent experiences show that financial market liberalization under such circumstances may lead to larger spreads between lending and deposit rates, not smaller spreads.

Historical experience shows that successful financial markets require strong government regulation, effective laws, and vigilant enforcement. Successful financial systems recognize four goals for financial regulation: maintaining the safety and soundness of the banking system, promoting competition, protecting consumers, and ensuring that all groups have access to capital. The strength of the U.S. economy today is partly due to its strong financial system, a system whose strength is based on many pillars that date back a century or more: financial regulations have evolved over the past 135 years, the strong protection of minority shareholders provided by common law predates the establishment of the United States, strong competition laws date back to the turn of the century, and effective securities laws have been spurred by the recognition of massive abuses that were undermining confidence in the markets.
By now, we also have ample experience of countries having tried to do without this legal and regulatory structure. The experience of some of the former socialist economies shows not only that without such laws such abuses will arise (in some cases heightened by the increased sophistication that has accompanied modern capital markets) but also that in these circumstances capital markets fail to perform their fundamental roles.\textsuperscript{xlii}

The theoretical analyses supporting the central role of financial markets have been confirmed by empirical studies, which demonstrate that countries with deeper financial markets grow faster,\textsuperscript{xliii} while financial crises have strong adverse effects on the economy (see for example Caprio 1997).

Again, both theory and evidence have enhanced our understanding of the causes of financial crises. For instance, the problems that arise when banks are undercapitalized have been highlighted by the several banking crises of the last decade, especially the U.S. savings and loan debacle, which have spawned a large literature explaining the moral hazard and looting behavior that results (Akerlof and Romer 1993). But it is not just capital (as conventionally measured) that provides incentives, it is also the expectation of future profits—what is called franchise value.

We now know a great deal both about what affects franchise value and about the interactions between capital requirements and franchise value. For instance, financial restraint—restrictions that, for instance, keep deposit interest rates below market-determined levels—may enhance franchise value and thus actually reduce these problems, leading to more prudent behavior by banks and thus a more efficient financial system (Caprio and Summers 1996). It has also been shown that increases in capital requirements are an inefficient substitute for the franchise value that is lost as a result of full liberalization; Pareto efficiency requires the use of both instruments, even in banking systems without deposit insurance (Hellman, Murdock,
and Stiglitz 1997). These results are confirmed empirically by the cross-section studies to which I referred earlier, which showed that financial restraint was associated with higher (or at least not lower) levels of investment and growth,\textsuperscript{xliiv} and that financial liberalization was systematically associated with an increased probability of a financial crisis.

Let me be clear: many countries have regulations that serve no useful purpose. They increase transactions costs, decrease efficiency, and do not enhance the stability of the financial system. Governments should eliminate these regulations. But there are a host of regulations, including restrictions on interest rates or lending to certain sectors (such as speculative real estate), that may enhance the stability of the financial system and thereby increase the efficiency of the economy. Although there may be a tradeoff between short-run efficiency and this stability, the costs of instability are so great that the long-run gains to the economy may more than offset any short-term losses (the observation of underregulated financial markets that result in huge investments in unoccupied commercial real estate—even when those borrowers were willing to pay higher interest rates than those willing to invest in productive plant and equipment—raises questions about the existence of the tradeoff). Caprio (1997), for instance, shows that five years after a financial crisis in a developing country, output is 7 percent lower than it would have been if the precrisis growth rates had been maintained,\textsuperscript{xlv} a shortfall that is even larger than the gap for OECD countries.

The appropriate set of regulations will, of course, depend on both the structure of the economy and the capacity of regulators. Developing countries typically face greater risks (both because their economies are less diversified and, for many, because they are more dependent on commodities with more variable prices), have less developed information systems, and lower regulatory capacities. And even more advanced countries, while recognizing the desirability of
risk-adjusted capital adequacy standards, have done a poor job of implementing them. (Even seemingly well-respected regulators in advanced countries continue to focus on credit risk, taking inadequate account of risks associated with capital values arising from changes in interest rates and exchange rates; and they continued to do so even after being warned of the distortions in lending policy to which such misguided regulations give rise.) On the other hand, the capacity of sophisticated capital markets to circumvent regulations may be more limited. In such circumstances, not only may higher capital adequacy standards be desirable, but so too may restrictions on interest rates and on certain forms of lending. xlvi

Such concerns may also affect the pace and sequencing of reforms. Theory would predict that financial market liberalization preceding the development of adequate regulatory capacity is likely to lead to an enhanced likelihood of a financial crisis, a prediction that has been borne out in a large number of countries and recently confirmed by systematic cross-country research (Demirgüç-Kunt and Detragiache 1997, 1998; Kaminsky and Reinhart 1996).

By the same token, opening up the capital account may subject the economy to more systemic risks; whether the gains are worth the risks will presumably depend on the circumstances of the country. Ideology would simply focus on the gains. Economic science would attempt to quantify both the gains and the risks, a balance that may differ markedly for countries in different circumstances. For instance, for a country with a very high savings rate, the marginal return from the additional capital that it might access may well not compensate the country for the increased risk. xlvi Interestingly, there is some evidence that even more generally, capital market liberalization is not associated with faster economic growth (Rodrik forthcoming). Although such studies are a source of considerable controversy, the following assertion is, I think, uncontroversial: Although there is by and large a consensus among economists—based on
a wealth of studies—that trade liberalization brings significant economic gains, there is no such consensus about capital account liberalization. There is, however, a consensus that at least one of the consequences of capital account liberalization is to increase the risk facing the economy. One advocate of the net benefits of financial liberalization, U.S. Deputy Treasury Secretary Lawrence Summers (1998), put this well when he compared today’s global capital markets to the jet airplane, noting that “the crashes, when they occur, are that much more spectacular.”

A third example may have particular relevance to some recent crises: many reforms entail reducing rents. But reducing rents affects capital asset values and the financial viability of firms and of the financial institutions that have provided them capital. The costs to the economy, in terms of economic disruption, of undertaking reforms with potentially large and uncertain effects on capital asset values, when financial institutions are weak and firms are on the verge of bankruptcy, may far outweigh the short-run efficiency gains. This is especially true in economies with poor information systems, so that the impact on particular firms may be hard to ascertain, and there may accordingly be adverse effects even on firms that receive little or no returns from such rents. A slight delay in undertaking such reforms may accordingly be desirable.

**Applied Economic Knowledge III: Privatization**

No concept is more sacred to the ideology of capitalism than private property, and it is thus not surprising that privatization has become a centerpiece of the modern ideology of reform. The ideology has been buttressed by the host of experiences of inefficient government enterprises. What distinguishes science from ideology is that it seeks to understand the reasons for the differences, and therefore the conditions under which privatization is likely to have the desired
results, without undue side effects. Again, we can list some of the essential theoretical and empirical propositions:

- The conditions under which a government enterprise can be privatized, capture full rents, and pursue a full range of social objectives that the public enterprise pursued are highly restrictive, corresponding closely to the highly restrictive conditions under which the fundamental theorems of welfare economics have been established. This result is sometimes called the Fundamental Theorem on Privatization (Sappington and Stiglitz 1987).

- There are instances in which public enterprises have operated at a level of efficiency comparable to, or greater than, that of similarly situated private enterprises; typically these are associated with firms subjected to competition, either in exports (as in the case of Korea’s steel industry) or domestically (as in Canada’s railroads, as described in Caves and Christensen 1980).

- Incentive problems arise in all large organizations, and are in many ways similar in public and private enterprises engaged in similar kinds of activities (see Stiglitz 1989a). Rent seeking activities occur in both private and public organizations (see Shleifer and Vishny 1989; and Edlin and Stiglitz 1995) and indeed, much of management activity may be directed to increasing their scope for capturing rents.

- Theorems establishing the efficiency of markets require both private property and competitive markets. Converting a public monopoly into a private monopoly may actually lead to higher, not lower, prices, and less, not more, overall economic efficiency.

While hardly a controlled experiment, the contrast between the outcomes of China’s emphasis on competition and the emphasis on privatization in the countries of Eastern Europe
and the former Soviet Union that I discussed at the beginning of my talk sheds some light on these issues.

That having been said, the general principle that institutions should focus on whatever is their comparative advantage suggests that governments should focus on those activities where the private sector is not likely to go, or in which externalities and public goods effects are likely to be especially important. It makes little sense to produce steel when public responsibilities such as the development and effective implementation of legal structures are inadequately fulfilled. But the hard issues lie in the in-between areas, and here again there is no consensus. Particularly problematic are those situations where there is a monopoly—natural or not—and in which governments have not yet developed effective competition and regulatory policies. Recent experiences in Africa in telecommunications show the potential for taking such measures as introducing competition in procurement (say of lines) as a way to lower costs to consumers and increase availability of services, rather than privatizing the entire telecommunications system to a single provider.

As I discussed earlier, the sequencing and pacing of reforms matter. Privatizing a monopoly results in a vested interest with the resources to influence the political process, which may successfully prevent the achievement of the second pillar of a successful market economy—that is, competition. Even if a convincing case for privatizing social security were made, doing so prior to the establishment of stable and efficient capital markets, as has been proposed in Russia, raises risks that are only now being fully realized. (Much of the discussion in this area has been tainted by a confusion between the gains from having a fully funded pension system and the gains from privatization itself.\textsuperscript{xlviii})
Policy Advice

In the first part of this talk, I argued that economic analysis needs to rise above the standards of journalism. The assertions need to be subjected to rigorous analysis—a combination of theory, focusing on internal consistency and the plausibility of the assumptions required to derive the conjectured relationships, and empirics, with that too combining statistical analysis with detailed evidence from particular episodes. Given the ever-changing nature of our economy and institutions, it will never be possible to completely eliminate uncertainty. This uncertainty will be particularly large in interpreting and responding to those unusual events we call crises. And this uncertainty should, at the very least, induce a modicum of humility on the part of advisers.

An essential part of policy advice based on economic science—as opposed to economic ideology—must be an explicit recognition of that uncertainty. Too often, that has not been the case. The presence of uncertainty means, of course, that it will be all the more difficult to assess the quality of the advice being rendered: successful economic recoveries may be in spite of the advice, and failures might have been even worse were it not for the advice. It is often difficult to find a counterfactual to use as a benchmark. I shall return to this theme later. Here, I want to stress a somewhat different point.

John Neville Keynes (1919), in his classic book *The Scope and Method of Political Economy*, argued for a well-defined role of economists in describing the consequences of alternative actions—defining the opportunity set, to use today’s language. This role, according to Neville Keynes, should be separated from that of the political process, which entails choosing among the points on the frontier of the opportunity set. Seldom is it the case that the frontier
consists of a single point. And accordingly, seldom should it be the case that the adviser should give a single recommendation.

This is particularly true when there is uncertainty about the consequences of various policies. Advisers, of course, have a responsibility to make sure that the alternative outcomes—and the probabilities associated with them—are understood as precisely as possible. But the ways in which risks are weighted and balanced becomes a political decision for many to participate in. No outsider can, or should, impose his or her risk preferences on those who must live with the consequences.

But here again the analytic and scientific role of the adviser becomes blurred, in a way that Neville Keynes, coming before the great advances in statistics to which his son John Maynard Keynes himself contributed so much, could not appreciate. Today, whether we know the term or not, we are all Bayesians—or almost all of us. We know that statistical inferences are based on loss functions that evaluate the consequences of different errors—and the appropriate loss function should not be that of the adviser, but that of the party being advised. But at least since the work of Arrow (1963), we also know that there is no general way to aggregate individual preferences in order to derive a social “loss” function. Thus, various groups within a society will have different loss functions, and different Bayesian estimates. It should come as no surprise, for instance, that those in the financial community tend to be more worried than the general public about inflation, for price increases can lead to a decrease in the real value of their financial assets. Those who depend upon financial assets see the tradeoffs between inflation and other variables, such as growth and employment, quite differently from, say, workers, who have more to lose from increased unemployment and more to gain from the erosion in value of their debts. It is thus incumbent on the scientific adviser not only to explain the uncertainties, but also
to explain the differences in views, the evidence in favor of the alternative views, and, if possible, how different loss functions weight the evidence to arrive at different Bayesian probabilities.

To be sure, our advice may not be couched in the vocabulary I have just used. (And there is a certain paternalism that suggests that this process is beyond the abilities of many industrial and, even more so, developing countries.) But I would argue that our advice becomes more credible when these issues are explained clearly, and the choices and risks well articulated. Whether we like it or not, the alternative views will be on the table anyway—that is the great strength of democracy and modern science—and the country will want to know what is the evidence and reasoning behind the alternative views.

This is becoming all the more important as we engage in capacity building and strengthen democratic institutions within the countries in which we work—a task I believe most of us are committed to doing. At the beginning of this talk, I referred to the renewed emphasis on sustainable development—sustainable not only in terms of its impact on the environment and the utilization of natural resources, but also in terms of its durability, its ability to withstand the vicissitudes of political processes. The more widely accepted the premises and appropriateness of any reform, the more sustainable will that reform be. We need to be especially sensitive to reforms and policies for which there may not only be a lack of consensus in the more developed countries, but which are also contrary to long-standing political doctrines in the countries themselves. Changes in political cultures cannot, and should not, be imposed from the top, though leadership—if it is truly convinced of the changes—can clearly facilitate such changes.

The mark of our success in capacity building over the past couple of decades is that there is now a cadre of well-trained professionals who are willing and able to engage in meaningful
dialogue on issues of economic policy within most of the developing countries. They bring a local knowledge that even someone who has lived a year or two in a country cannot match—let alone someone flying in for a three-week mission. To be sure, they may lack the cross-country experience that an outside adviser can bring, and it is from the marriage of these two knowledge bases that the most fruitful lessons can be drawn.

**Incentives and Advisers**

A key part of the advice that any economist gives today concerns incentives. We look at the implicit as well as the explicit incentives facing households, firms, and even government bureaucrats. A central part of the rationale for privatization and liberalization is an improvement in incentives, including that associated with more competition. Often, the most subtle part of an economist’s task in analyzing the economic problems facing a country is to understand the complex set of incentives facing various participants as a result of the interaction of institutions, laws, and regulations.

Advisers too are subject to incentive issues, and those who pay attention to their advice, whether the direct recipients or interested third parties, need to be aware of those incentives. Indeed, there may even be scope for improvements in the “market for advice.”

The nature of these incentive problems is well illustrated by recent discussions in the healthcare sector. Doctors provide a multitude of services: they diagnose ailments and provide advice about appropriate prevention and treatment as well as directly providing services intended to address health problems. The market for medical services, however, is distorted by
imperfections in information that allow room for the doctors’ personal and institutional incentives to shape the kinds of care that they provide.

The most commonly noted incentive effects in today’s healthcare system, for example, have to do with the institutional structure through which medical services are provided. The fee-for-service system prevalent in the United States has been widely criticized because doctors have an incentive to overprovide. There is also a widespread view that even though the doctors subscribe to “professional norms,” those norms themselves adjust to the incentives facing healthcare providers. Managed care, on the other hand, has been widely criticized because health management organizations (HMOs) have an incentive to underprovide in order to cut costs.

These incentive effects exert a strong influence because of imperfections of information in the field of medical care. Clients rarely know the costs and benefits of the range of treatments available to them and usually cannot serve as a check upon the health-care providers’ preferences. Typically, even information about doctors and their competence is very limited.

The knowledge of particular doctors and even of particular procedures by those at the cutting edge of medical science is also imperfect and there is thus often no “scientific” benchmark to balance doctors’ or insurers’ preferences. Some recent studies have identified examples of procedures, for instance, that are practiced much more frequently in one part of the country than in another, with no statistical evidence on improved health conditions. To be sure, most of these procedures have little downside risk, and the patients receiving the treatment typically feel good. Indeed, honest doctors may even report that the procedure does not have benefits for all patients, and that they cannot predict with precision whether a particular patient will benefit. What few doctors will report, of course, is that there is no evidence that the procedure has any effect at all. When confronted with such statistical evidence, they will
typically explain the faults in the study—how it left out one critical variable or another—and state that, *given the low risk, in their judgment the procedure is warranted.*

One would think that second opinions could alleviate these information problems and force doctors to justify their decisions both to their patients and to each other. Typically, however, the second opinion comes from a doctor subscribing to the same local “norms.” If it is generally believed in the community that tonsillectomies reduce the incidence of sore throats, then the second opinion is likely to recommend a tonsillectomy for a patient suffering from repeated sore throats—regardless of the evidence questioning the efficacy of the procedure. It is also perhaps worth noting that there is a guild effect—a reluctance by members within a profession to criticize others—which may also undermine the quality of information conveyed in a second opinion.

One of the advances in modern medicine, however, is the recognition of uncertainty and the openness about risks. Modern medicine constantly seeks to perform controlled studies and statistical tests of the validity of a procedure. It even trusts patients with making judgments when there are various risks associated with alternative procedures. Finally, modern medicine recognizes that an essential part of the successful practice of medicine is doctors’ bedside manner, which can determine their ability to match patients’ preferences as well as influence the extent to which their orders will be followed.

Pondering the issues faced by doctors, including incentives and uncertainty, has a lot to offer those of us engaged in providing economic advice, or providing economic assistance conditional on certain policies being adopted. To be sure, the problem facing economic advisers in actually implementing prescriptions is far more challenging than that facing doctors. Economists, unlike doctors, do not deal with the entity most affected by their advice. Patients
rarely have to be convinced to save their own lives, but politicians often have to be convinced to place the public interests of their country ahead of the private interests they may have in the status quo. At least in the short run (and for politicians, who have an incentive to push problems into the next person’s watch, often the only relevant horizon is the short run), there is a clear conflict of interest, a conflict that could be mitigated (but not eliminated) by a policy of consistent openness and transparency. Second, while doctors deal with decisionmaking by an individual, economists’ advice typically has to be implemented by a political process in which the adviser is often an outsider. The economist-politician dialogue is a part of a larger game with an audience. Imagine the consequences if others were permitted to listen to both what the doctor says and how the patient responds: a lender might not so willing to lend money to a patient who has been diagnosed as having incurable cancer or who is refusing to take the medicine that could cure his or her cancer. The adviser’s defense strategy of explaining poor results by pointing to the failure of the patient to follow his advice could well exacerbate the difficulties of the afflicted party. The inevitable audience in economic advising creates the added difficulty of such external reactions, particularly when information is released sporadically.

Consider, however, the incentive issues for shaping the content of economic advice. In assessing the incentive structure that shapes the dispensation of economic advice, one has to look at both individual and organizational incentives. To whom are the advisers accountable? Who pays them? What is the governance structure? Many of the incentive problems that have been noted in the public as well as private sectors apply here as well: incentives to provide or restrict information in ways that hide mistakes, create rents, and reduce competition (partly by product differentiation, partly by creating barriers to entry by, for instance, restricting the flow of information, an essential ingredient in the production process of “advice”).
One of the arguments sometimes put forward for the role of the World Bank and other international public advisory bodies is that they serve as honest brokers. There is always the worry that private advisers might be under the pay of two masters, or at least throw business toward a firm or a technology dominated by a firm with which they hope to have a future contract; or that an adviser from a particular country might give advice that would favor the technology of that country as opposed to another.

It should not be concluded that simply because an advisory service is publicly provided special interests do not have influence. Anyone who has dealt with governments, let alone participated in one, recognizes that when an elected president appoints different ministers, all with the mandate to serve the national interest, each soon takes on an advocacy role for his ministry and the special interests that is represents, even if he does not come from those special interests.

The problem of regulatory capture (Stigler 1981) is equally if not more acute in the so-called independent agencies set up to exercise expertise in a particular domain. Although some countries have tried to combine an independent central bank with expertise and representativeness, in many countries the central bank is governed largely by those drawn from the financial and business community, with no representation of the concerns of broader segments of society that are affected by monetary policy, such as workers. Finance ministries too, while often entrusted with providing a national overview of budgetary issues, typically have closer ties to the financial community from which they raise funds and draw their top officials, most of whom return to the financial community after government service. Is it a surprise, then, that the advice given by those accountable to these ministries and central banks often differs from that which might have been given by a labor ministry? Or that labor unions in East Asia have
been sharply critical of some of the measures taken in the recent crisis? It may not represent a lack of understanding of the economic fundamentals so much as a different reading of the scientific evidence and, more important, a different weighting of the risks.

Like the market for healthcare, the market for economic advice contains many information imperfections and uncertainties that allow these incentive effects to have a strong influence on the “prescription” when there is no universally accepted “right” advice. In some ways the information imperfections are much worse. Not only are policies questioned, but the dialogue between client and adviser may not be as open as the patient-physician interaction. Governments in many countries have a strong proclivity for secrecy. Elsewhere (Stiglitz 1998), I have explained the various reasons for this proclivity—not just providing more scope for the work of special interest groups, great cover for corruption and for hiding mistakes; but also creating rents (by creating an artificial scarcity of information), which can be exchanged for something of value (if only better, and often distorted, press coverage.) Further, governments have an incentive to withhold information that would reflect badly on their creditworthiness.

There is another reason that democratic governments themselves may be unwilling to be more transparent and open about international agreements, and that is that those agreements may contain provisions that counter platforms upon which the government was elected or widespread views held within the electorate. But this in turn raises fundamental problems: should governments be encouraged to participate in such agreements, which may serve to undermine democratic processes themselves? To be sure, governments can be encouraged to engage in a national dialogue to reexamine such policies in light of widely held values.

Thus, there are a variety of reasons that governments may be reluctant to engage in open dialogue, or even to make economic information more readily available. The steps taken in recent
years, under the leadership of the International Monetary Fund, to make data more readily available in standardized form are major advances. There is a consensus, however, that better data will not be enough to prevent all financial crises.\textsuperscript{lv}

Can public agencies that detect a problem make a public statement that could, in fact, exacerbate the problem? And this in turn raises numerous questions about institutional arrangements: should statistical agencies, entrusted with gathering and disseminating information, be separated from policy agencies? There are potential conflicts of interest between the collection of data, the analysis of data, and the provision of “treatment” services, analogous in many ways to the conflict of interest in the healthcare market. Recognizing the inherent problems, many countries have chosen to create independent statistical agencies.

Like healthcare, the opportunity for “second opinions” could plausibly increase the incentive for economic advisers to act in ways that they can justify to their colleagues and clients. The adviser, like the doctor, has to worry about his reputation. But in both cases it may be difficult if not impossible to make very accurate inferences about performance. Each heart transplant is different, and the total number is so few: is a 50 percent death rate a mark of a poor doctor, or a willingness to take the riskiest patients? Would the patients who died have died anyway? The only doctor in town may worry about prescribing too tough a medicine, lest sick patients be reluctant to come to him until it is too late; but he may be tempted to shy away from easy remedies, even when they are just as effective as, or more effective than, tough medicine—the tough regimen shows that the doctor is treating a serious problem and knows what is required! Tough remedies also help preserve the image of “expertise” versus lesser, “commonsense” solutions. And the association of pain with redemption is also very firmly rooted in the religions and cultures of many countries.
At the very least, few of us have an incentive to expose our mistakes. In some cases, there may even be a guild mentality, imposing social sanctions on those who expose the mistakes of other members of the guild. Does this perhaps account, at least partly, for the secrecy that surrounds so much advice, making it difficult for others to give a second opinion? (At least in medicine, there is full sharing of information with those called in to render a second opinion.)

The most important question that this analogy raises, however, is this: Have we yet reached the status of modern medicine, where we recognize the risks and uncertainties, or is there a tendency to blame the patient for not following the advice precisely?

**Improving Our Advice**

As I said at the beginning of this lecture, economics as a science can perhaps be best compared to astronomy. Like astronomers, we lack the ability to do controlled experiments. We rely on thought experiments and the natural experiments that history provides. As in astronomy, a theory can be overturned by a single, telling piece of evidence; one does not simply count arguments on one side or the other. And in both sciences, theory—a close examination of the internal consistency of explanations combined with what evidence we do have—can play a pivotal role. There was a high degree of confidence in the existence of black holes, for example, even before the telling evidence of their existence (in the pattern of rotating stars) was discovered, and even today, the number of observations remains very limited (Gribben 1992).

If we are to move from ideology to science in dispensing policy advice, we need to demand the same attention to internal consistency of our theories and explanations. And our efforts to improve our predictive ability—said to be the hallmark of science—need to take this
need for consistency into account. General statements do not seem to be very valuable: there are soothsayers who have predicted nine out of the last two crises, and revel in their success. By the same token, there are weaknesses in dozens of financial markets, and someone who calls attention to these weaknesses might rightly claim that she anticipated the problem; yet she has not distinguished the market that had the crisis from the dozens of others that did not have a crisis. Growth forecasts should reflect anticipations of crises, and in that sense, none of the major international forecasters seems to have scored well.

But this is perhaps taking too narrow a view of economists’ predictions. Those who argued that regulatory forbearance would exacerbate the U.S. banking crisis provided a prediction that was realized. But the prediction was more fine grained: those banks that were the most undercapitalized engaged in the riskiest behavior, just as the theory predicted. By the same token, there are implicit predictions in much of the policy advice: those who advised that Kenya liberalize its financial markets presumably predicted a reduction in spreads. The failure of those reductions to occur should call the underlying theory into question.

Many economic forecasters now focus on making conditional statements, with a ready explanation on hand when reality differs from that predicted. Too often, they engage in ex post rationalizations for these failures: the government did such and such, undermining the anticipated and desirable effects of the policy change. The factors that would undermine the workings of economic policy have to be specified in advance; and if the conditions for success are so onerous that they are unlikely to be met, then that should be taken into account in assessing the desirability of the policy itself.

There is room for far more research on the modes in which we give advice as well as on the issues on which we give advice. I have alluded to several examples already, for instance,
concerning the economic effects of financial market liberalization in highly underdeveloped capital markets.

Consider another issue that I have discussed extensively in this paper—the issue of secrecy. Those who would like to suppress open dialogue and criticism suggest that it may rattle markets, leading to greater uncertainty (and presumably greater risk premiums, or at least greater variance in prices), or that it may weaken a country’s resolve to undertake “painful medicine.” Critics of these seemingly antidemocratic views point out, on the contrary, that information eventually comes out anyway, and that more open dialogue is akin to flexible exchange rates: it leads to a smoother flow of information and thereby enhances overall stability. And that open dialogue is likely to result in a consensus behind a policy—presuming that it is a policy that can be justified—and that the only way in which durable, sustainable policies can be implemented is through a process of consensus building. These are, in part at least, testable propositions. What is the evidence, for instance, that prices differ long from fundamentals, that the risk premium is increased by open dialogue?

To be sure, even if it should turn out that there is evidence that the economic costs of open discussion exceed the benefits, that does not end the matter. To return to my earlier theme, the task of the adviser and economist is to lay out the consequences of alternative policies. A country may decide that the advantages, in terms of strengthening democratic institutions, far outweigh the economic costs. As advisers, we should also point out the implicit or explicit incentives of various parties—that is, the incentive of some outside advisers and government officials to prefer secrecy. And the answers to how one weighs these tradeoffs may depend on the strength or fragility of democratic institutions in the country itself.
The task of putting our advice on a more scientific basis will be a difficult one, and may result in putting our own institutions and their incentives under closer scrutiny. But it is a quest upon which we must continue. Although it may have become unfashionable to refer to it, the long history of the encounters between many less developed countries and the more advanced countries has left its scars, along with its other, more positive legacies. In the minds of the colonial powers, the three or five decades that have passed may seem an eon, but to many of the afflicted, it is but a short moment in a far longer history of oppression. And many of these early encounters were based on a mixture of self-interest and ideology, with missionaries suppressing local cultures in the name of a higher authority. Although the early efforts at market access were somewhat less delicate—military threats rather than economic sanctions—these efforts were asserted with no less moral authority, even when they were for deeply immoral purposes, such as the opening of Chinese markets to drug traffic in the Opium Wars.\textsuperscript{lvi}

If the advice of outsiders is to be taken seriously, it must be based on reasoned argument—on science, on evidence, with a full recognition of the limitations and uncertainties that are associated with scientific evidence, not the confidence so typically associated with ideology; with the recognition that new evidence may, or indeed is likely to, require a change of policy, even perhaps a change in beliefs, a process of Bayesian sequential decisionmaking that is the foundation of modern decision sciences.

\textbf{Concluding Remarks}

We celebrate today the tenth anniversary of the Annual Bank Conference on Development Economics, a conference dedicated to the principle that economic science—and the promotion of
research, dissemination, and dialogue about economics—can improve the chances of growth and the alleviation of poverty in the developing countries of the world. In the decade since this series was initiated by Stanley Fischer, as the World Bank’s chief economist, it has, in my judgment, proved its worth.

I hope that this meeting reflects well the breadth of concerns and the spirit that have marked each of the meetings over the past decade. Our discussions range from the role of geography to that of ethnic conflict, from the implications of financial markets for macroeconomic behavior to the importance of competition policy for microeconomic performance. The willingness of so many distinguished people to share their ideas and time speaks to the significance that this annual conference has attained within the development community.

In this talk, I have tried to identify several of the ways in which science, including economic science, is distinguished from ideology: a willingness to question everything and a recognition of the uncertainties associated with our knowledge, and the concomitant humility that that instills. In closing, I want to emphasize a further attribute of the scientific process: the value it places on openness and democracy. Scientific advances require an open exchange of information: universities are committed to the importance of free speech, and we, and other public agencies that fund research, insist that data be made publicly available, so that any results can be examined for replicability and accuracy. Open debate and discussion is both a natural part of the questioning spirit and the recognition of uncertainty, and a requisite for the successful advance of science.

A second attribute of science is that ideas and arguments are evaluated on their own merit, not on the basis of authority or received wisdom. In this sense, science is very democratic. Science pays no attention to status, social background, age, or any of the other myriad
characteristics that form part of our social structures. Even a doctorate from a first-rate university does not give one’s opinions or evidence any more weight before the court of scientific opinion.

It is with this spirit—the spirit of questioning, of the recognition of the limitations of our knowledge and our quest to expand the bounds, with the full recognition of the uncertainties, a spirit of open and democratic debate and discussion—that I look forward to the discussion of the next two days.
References


Notes

i There is no standard terminology for these sets of doctrines, and various practitioners advocated these doctrines with varying degrees of subtlety and emphasis. The set of views is often summarized as the “Washington consensus,” though to be sure, there never was a consensus even in Washington (let alone outside of Washington) on the appropriateness of these policies. For an excellent and subtle articulation of the Washington consensus and its evolution, see Williamson (1990).

ii See for instance Rodrik (1996), who compares the policies pursued by the Republic of Korea and Taiwan (China), to the 10 elements of the Washington consensus identified by Williamson (1990). Rodrik finds that “Judging by the number of prescriptions these countries did or did not follow, we would have to award South Korea a score of about five (out of ten), and Taiwan about six.” He notes that these economies followed most of the macroeconomic prescriptions, but departed from many of the microeconomic recommendations, especially different types of liberalization and deregulation.

iii Unofficial estimates present a similar picture, although the magnitudes of the declines are less severe. Studies that take into account the shift of production into the unmeasured informal sector (see Kaufmann and Kaliberda 1996) and trends in consumption (see Milanovic 1998) have found that the decline in the former Soviet Union is closer to one-quarter to one-third of GDP and the declines in Eastern Europe are a few percentage points lower than the official estimates. Overall, however, almost no one claims that standards of living in Eastern Europe and the former Soviet Union have improved very much in the last decade, and any improvements have certainly been dwarfed by the enormous progress in China.

v See the papers on “The Credit Market” collected in Mankiw and Romer (1991).


vii It is not my purpose to review in detail the causes or consequences of the East Asian crisis, or the appropriate responses to it. Those are matters which I have taken up elsewhere (Stiglitz forthcoming).


ix The book is In Search of Excellence (Peters and Waterman 1982). One good critique (Kolodny, Laurence, and Ghosh 1989) finds that that by the authors’ criteria these companies displayed mean reversion in the years following the publication of the book. They also find that judged by better motivated criteria, including risk adjustment, the performance of the “excellent” companies is little better than that of a randomly selected control group even in the sample.

x See, for example, Edward Prescott (1986), who writes: “Economic fluctuations are optimal responses to uncertainty in the rate of technological change.”

xi Some of the original results are in Gorman (1953). A recent derivation of general conditions for the admissibility of a representative agent are provided by Lewbel (1989), and Kirman (1992) is a thoughtful discussion of representative agents in macroeconomic models.
The term “constrained” is inserted simply to remind us that the costs of information and marketing are taken into account in the analysis.

From a Bayesian perspective, the two will respond in the same way only if they share the same priors, that is, if the assumption of common knowledge is satisfied.

In a world of stochastic models, matters are more complicated. For instance, what one means when $x$ is a “cause” is that the probability of the event occurring is significantly increased by the presence of $x$. Here, as always, one has to be careful to distinguish between association and causation. In practice, econometric tests are seldom dispositive; thought experiments—theoretical analyses—are required. The main distinction is often between poorly articulated and formulated “models” and those which attempt to uncover the implicit assumptions. Furthermore, in most economic circumstances there are no “single” causes; rather it is the interaction of a multiplicity of factors which gives rise to an effect. This clearly complicates the problem of making inferences about the “cause” of a crisis.

There have, of course, been financial crises, like that in Korea in 1980 and that in Thailand in 1983. What is striking is the fact that since 1965, Indonesia, Korea, and Malaysia have each seen only one year of negative growth; and Thailand has not seen any. During that period, GDP fell in five separate years in both the United States and the United Kingdom (World Bank 1998).

The fiscal costs alone of resolving these crises were substantial. Finland’s (1991–93) cost 8.0 percent of GDP, Sweden’s (1991) cost 6.4 percent of GDP, and Norway’s (1987–89) cost 4.0 percent of GDP. By way of contrast, the fiscal cost of resolving banking crises ranges from the relatively low 3.2 percent of GDP for the U.S. savings and loan debacle (1984–91) to 55.3 percent of GDP for Argentina’s 1980–82 banking crisis (Caprio and Klingebiel 1996).


Frankel and Schmukler (1998) find convincing evidence that country fund holders, who are usually outside investors, have systematically less information about local assets than do the holders of the underlying assets, usually local residents and some large international investors. Greenwald (1998) studies the implications of the asymmetry of information between local and outside investors.

It is noteworthy that the International Monetary Fund (IMF) review of the Mexican experience emphasized the role of domestic capital flight, finding that “the available data show that the pressure on Mexico’s foreign exchange reserves during 1994, and in particular just prior to the devaluation, came not from the flight of foreign investors or from speculative position-taking by these investors, but from Mexican residents” (IMF 1995). See also Frankel and Schmukler (1996) for systematic evidence supporting this conclusion. By most accounts domestic flight has also played an important role in Indonesia. The reasons for differences in the speed and pattern of domestic and international responses are clear: domestic investors typically are more informed about what is going on within their country. Moreover, the high correlation between returns on human and physical capital within the country mean that domestic investors are less diversified and therefore should act in a more risk-averse manner.

Two of the earlier studies are Tyron (1979) and Frankel (1980); and see Hodrick (1988) for a
survey. There is much debate about why the joint assumptions of rational expectations plus risk
neutrality are rejected in the foreign exchange market, and indeed in most other financial
markets. The common explanation that these rejections can be explained by changing risk premia
does not do a very good job in explaining the systematic deviations that we observe in the data
(see Frankel and Froot 1989).

The classic paper by Meese and Rogoff (1983) found that none of the major structural models
could explain out-of-sample exchange rate movements and they were all dominated by a simple
random walk model.

These rolling correlations are based on ongoing work by Sergio Schmukler.

There is a large literature beginning with Vickers (1986) on signaling in monetary policy.

In the context of the United States, a fascinating study by Romer and Romer (1996) finds that
the Federal Reserve’s forecasts of inflation are substantially more accurate than private forecasts.
It also finds that monetary policy actions reveal some of this private information, leading
commercial forecasters to revise their expectations accordingly.

Romer and Romer (1996) show that the information revelation from a monetary tightening
(the indication that an economy is in the bad state of high expected inflation) more than offsets
its direct economic effects, thus leading commercial forecasters, on average, to revise up their
expectations for inflation. This finding begs the question of why the Federal Reserve does not
release its contemporaneous forecasts, in contrast to, say, the Administration and the
Congressional Budget Office, both of which publicly reveal the forecasts underlying their
budgetary policies and proposals.

There has, however, been extensive work on the importance of signaling in foreign exchange
markets. Agénor (1994) provides a theoretical model in which signaling can help maintain a good equilibrium, although the signals he describes, “the removal of capital controls, a drastic cut in the budget deficit, the appointment of a ‘conservative’ central banker, etc.,” do not explicitly include high interest rates. Dominguez and Frankel (1990) find that even sterilized interventions can, at least under certain circumstances, affect exchange rates, and ascribe the majority of this affect to the signaling component of the intervention. Wantanabe (1994) finds similar results for Japan. Interestingly, in these analyses foreign exchange interventions are important because they signal the commitment to a stronger currency, implicitly opening up the possibility of further interventions, and possibly even tighter monetary policy, in the future. In contrast, when a country uses high interest rates to defend its currency, usually the authorities’ announced intention and the economy’s expectation is that these rates will be lowered over time.

Allan Drazen and Paul Masson provide a nice story illustrating this point: “One afternoon a colleague announces to you that he is serious about losing weight and plans to skip dinner. He adds that he has not eaten for two days. Does this information make it more or less credible that he really will skip dinner?”


One possibility is government interventions which impose Pigouvian corrective taxes on those activities which generated the systemic risks, with revenues being used to provide for improved safety nets, which in addition to their direct benefits will send a signal that the government’s reform efforts will be sustainable.

Most economic theory is based on the presumption that what matters are real interest rates. But the finance-based macroeconomic models recognize the possibility that changes in inflation
rates may have significant *real* effects, in the presence of partial nominal contracting (for example, Cooper 1990). Evidence for partial nominal contracting and an explanation for why it would exist is provided by Clay, Greenwald, and Stiglitz (1990). There is, moreover, considerable evidence that *real* behavior (for example, investment) is not affected by real interest rates, but is affected by both the level and variability of inflation.

Even for countries which are not *net* debtors, particular firms will be debtors while others will be creditors. One of the important lessons to emerge from the new finance-based macroeconomic models is that although the increase in net worth to creditors from a currency depreciation will just offset the losses of debtors (and conversely for currency appreciations), the net macroeconomic effects can be significant and adverse, as the increased investment and employment activity of the gainers will not be sufficient to offset the reductions on the part of the losers. (This is because the relationship between investment, including investments in inventories and new hires, and net worth is nonlinear.) For a discussion of this intuition in the context of changing interest rates see Greenwald and Stiglitz (1993a).

This has been an especially virulent criticism of cross-country growth regressions. Examples of this problem abound. Pack (1994), for instance, presents a wide-ranging critique of cross-country growth regressions, pointing out that many of the variables on the right-hand side of the regressions are not really exogenous. For instance, government expenditures are clearly endogenous and could well depend not just on past growth but also on expected future growth (through wealth effects). Most attempts to deal with this kind of simultaneity have been unconvincing. To be sure, this is not a criticism of cross-country regressions per se, only of *bad* cross-country regressions. But the seeming dominance in the field of studies plagued by these
and other econometric problems both suggests how difficult it is to make inferences based on empirics alone and how cautious we should be in applying any so-called results to actual policy situations.

xxxiv Obviously, a country which is borrowing from abroad to finance investment in nontradables will inherently face a foreign exchange exposure risk; but typically, aggregate foreign borrowing does not exceed aggregate investment in tradables, and hence even for longer-term investments, countries can limit their exposure, at least in the aggregate. Many of the cases of excessive foreign exchange exposure reflect misperceptions on the part of borrowers and lenders of the foreign exchange risks, a misperception to which domestic exchange rate policy may have contributed. The repeated instances of bailouts may in fact imply that private lenders may not have faced risks anywhere commensurate with the social risks.


xxxvi The reason for multiple equilibria is easy to see. Normally exchange rate depreciation leads to increased exports and thus a greater demand for local currency. A very large depreciation, however, can result in a substantially higher probability that firms will default on their foreign currency–denominated debts. This, together with weaker economic conditions, reduces capital inflows, resulting in a decrease in the demand for the currency that more than offsets the increased demand for local currency to buy exports. Giffen-like demand curves (as well as backward-bending supply curves) can give rise to multiple equilibria. In an intertemporal model, exchange rates today depend on expectations about the equilibrium exchange rate in the future. Higher interest rates leading to lower investment and less competitiveness lead to lower exchange rates in the future. More important, the resulting shifts in the demand and supply
curves may lead to the elimination of the “upper” equilibrium exchange rate.

xxxvii For an excellent recent survey see Campbell, Lo, and MacKinlay (1997), especially chapter 2.

xxxviii This point was the center of the famous Jackson Hole debate, in which all the economists argued in support of this proposition, while many of the central bankers made assertions to the contrary (without presenting either theory or evidence in support of their beliefs). See Federal Reserve Bank of Kansas City (1995) for a summary of the discussions.

xxxix In fact, according to the standard theory today’s exchange rate should depreciate also, and possibly by even more than the depreciation in the equilibrium interest rate. If interest rates fall with deficit reduction, then investors will only have an incentive to keep their money in the country if they expect an appreciating currency. In order to have a depreciated equilibrium exchange rate and an appreciating currency, we would need to see an immediate large depreciation of the actual exchange rate followed by a rise up to its new, somewhat depreciated, equilibrium value. As discussed above, these short-run relationships are not very robust. Ample experience, however, has shown that in the longer run fiscal deficits are associated with stronger exchange rates, as in the United States in the early 1980s.

There is an important strand of the literature, however, which focuses not on the capital asset equilibrium, but on short-run capital flows. Larger fiscal deficits are associated with larger borrowing from abroad, or decreased holding of reserves. Reduced fiscal deficits lead to reduced need for foreign borrowing and thereby a stronger currency. Although such models provide a rationale for the focus on current account deficits, the evidence that such deficits help predict currency crises is, at best, limited (Frankel and Rose 1996). Part of the reason is that the real
issue has to do not with the size of the deficit, but with the ability of the country to finance the
deficit. This depends more on stock (state) variables, such as the overall debt or beliefs, than on
flow variables (except to the extent that these affect the stock variables, for example, through
changing beliefs).
xl For an application to financial markets, see Jaffee and Stiglitz (1990).
xli This is the case for Kenya. For further evidence from Pakistan see Aleem (1990).
xlii See Coffee (1996), Ellerman (forthcoming), and Nikitin and Weiss (1997).
xliii See Levine (1997) for an excellent survey.
xliv Studies have used cross-country regressions to show that growth is positively associated with
high real interest rates, a finding that is interpreted as evidence that financial repression (which,
according to these studies, is manifested by low real interest rates) is bad for growth (see for
example Gelb 1989). These studies, however, were shown to be badly flawed for several reasons.
The observed results were dominated by the extreme cases of very negative real interest rates.
Also, these estimates were biased by simultaneity problems. Implicitly they were based on a
model that government policies (in particular not interfering in the setting of interest rates) led to
higher real interest rates, which led to faster growth. But it is probably more plausible that high
real interest rates and high growth are both simultaneously caused by high productivity. Finally,
the regressions upon which these results were based were misspecified. Low real interest rates
are correlated with high inflation, a symptom of bad macroeconomic policies, and it is these bad
policies which lead to low growth; including inflation as a separate variable eliminates the
alleged negative effect of financial repression on growth. See Murdock and Stiglitz (1993), and
the discussion in World Bank (1993) and Stiglitz (1994a).
He also finds no indication that the precrisis growth rates were higher than normal.

Not only on deposit rates (which can help enhance franchise value, as I have already noted), but also on lending rates. When there is deposit insurance (implicit or explicit) with premiums imperfectly adjusted for risk, and without appropriate adjustments in risk adequacy standards, banks have an incentive to undertake excessively risky lending. Ceilings on lending rates or restrictions on certain types of loans can partially offset this proclivity.

To be sure, there are other gains that have to be weighed in the balance—the possibility of greater portfolio diversification actually reducing risk, or the increased efficiency from the discipline provided by open capital accounts.

Indeed, privatization typically reduces the scope for intergenerational risk sharing, and with few exceptions, fails to provide full insurance against inflation. Thus, any efficiency gains from privatization have to be balanced against the additional risks which individuals typically have to bear. Even for a highly developed capital market such as the United States, it is estimated that privatization will substantially increase transactions costs. See U.S. Council of Economic Advisers (1997).

See, for instance, Wennberg, Freeman, and Culp (1987) and Chassin and others (1987).

If HMOs are required to pay for second opinions, for example, this might increase the pressure on doctors to perform a satisfactory analysis the first time. On the other hand, it might create pressure for the doctors to appear more sure of themselves and downplay the uncertainty and cost-benefit analysis involved in choosing a particular treatment.

In the United States, the guild effect has been somewhat undermined by other incentives, particularly those provided by malpractice suits.
Experiments with patient-physician decisionmaking models have shown a divergence between patients’ and physicians’ preferences: when clients and doctors worked together in two-staff model HMOs, for example, there was a 40 percent decline in surgery rates on noncancerous enlarged prostates (Robert Wood Johnson Foundation 1997).

For my discussion of this issue in the context of the United States see Stiglitz (1997).

To be sure, if the market for information were perfect, if government’s interests and those of the country were perfectly coincidental, and if politicians were not myopic, there would be effective incentives for information revelation (see Grossman 1981). In fact, there is by now a firm understanding of the nature of imperfections in the market for information, reflected in the numerous disclosure requirements in securities laws, for example.

Note that the call for better information is not consistent with the ideology of a free market economy. To the extent that believers in such ideology attempt to derive its support from the fundamental theorems of welfare economics, they should believe that all relevant information is conveyed in prices. On a more concrete level, the most recent crises have been related to private capital flows, and a mark of capital market liberalization is the freedom of agents to engage in such transactions without reporting to the government. It is also interesting to note the curious irony behind those arguing for decentralization, on the one hand, and the need for the kind of aggregate information which such decentralization typically makes hard to collect.

For a good discussion of the Opium Wars see Fay (1997). It is hard to escape the irony between the early drug wars—Western powers trying to keep China open to the flow of drugs—and the more recent equally adamant stands trying to stem the flow of drugs into their own countries. Only the lapse of time—and lack of knowledge of these historical
experiences—softens what would otherwise seem an intolerable level of hypocrisy.