Forthcoming, Journal of Economic Literature

The International Monetary Fund in a Time of Crisis

A review essay of Stanley Fischer: IMF Essays from a Time of Crisis: The International Financial System, Stabilization, and Development. Cambridge, MA: MIT Press, 2004.

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The 1990s were turbulent times in the international monetary system. The turbulence began with the hyperinflations of the former Soviet states, passed through the Tequila crisis in Mexico in 1994, the Asian financial crises of 1997, the Russian collapse of 1998 and the international financial contagion associated with each of these episodes. In each country affected, the crises had substantial real costs: savings wiped out, jobs eliminated, purchasing power reduced. With each new crisis the call from the economics profession built to a crescendo: why can't we forecast these crises better? Why can't we pull the affected economies through the crisis with less real economic loss?

The International Monetary Fund (IMF) was the first line of defense of the international economy against these crises. The IMF provided forecasts, gave policy advice, and when the crises came it coordinated crisis management through financing packages subject to conditionality to assist the country's adjustment. It took a great deal of criticism for its ability (some would say inability) to fill these roles. Stanley Fischer was deputy managing director of the IMF from 1994 to 2001, and perhaps more than any other individual he personifies the international "rapid response" to financial crises in the 1990s. This book is a collection of essays written during his tenure at the IMF; taken together, they represent the strongest and most logical defense of IMF initiatives in the 1990s that I have seen in print.

Those expecting a "tell-all" memoir of Fischer's tenure at the IMF, or a response in kind to his critics, will be surprised. The essays in this book exhibit the same rigor and professionalism that have been the hallmark of his academic career. Sixteen essays are included, grouped loosely under three headings: (1) The Role of the IMF and Reform of the International Financial System, (2) Macroeconomic Policy, Stabilization and Transition, and (3) Poverty and Development. Most are single-authored, although some of the essays are co-authored with David Burton, William Easterly, Ratna Sahay or

[1] Thanks to Graham Bird, Stanley Black, Axel Dreher, Ayse Evrensel, Joseph Joyce and Marcelo Selowsky for suggestions on previous drafts of this essay; none of these should be saddled with responsibility for the conclusions drawn here.

Carlos Végh. Each essay is presented as originally written, and an introduction to each penned after his departure from the IMF is also included to highlight those points made that he finds most compelling – or that he now would retract. The three sections of the book correspond to three distinct policy perspectives. The first section is devoted to the role of the IMF within the international financial system. The questions Fischer addresses in this section are those of reforms of the international financial system broadly defined, and specifically of the IMF's role in assisting countries in financial crisis. The second section is devoted to monetary and exchange-rate policy choices of central banks in the IMF's member countries. Fischer considers questions at the level of the central bank. What is the appropriate exchange-rate regime? What are the causes and costs of high inflation and hyperinflation? The third section examines the effect of macroeconomic policy on the incidence of poverty and the plight of the poor. In this section, Fischer focuses on the phenomena of inflation and market liberalization to derive their impact on the poor.

Those of you familiar with Fischer's journal articles or textbooks know that he is quite comfortable creating and expositing formal models of macroeconomic behavior. The essays in this volume demonstrate that he is also quite comfortable with a rigorous yet non-formal analysis based upon empirical observation and stylized facts. The only prerequisite (and only for a handful of the essays) will be a nodding acquaintance with regression analysis. This does not imply that this book will be a beach read for the typical economist, since the argumentation is both dense and sophisticated, but it will be accessible to those wishing to devote the time.

I have two goals in the following sections. First, I'd like to provide a flavor of the topics covered and logical reasoning used in the essays – this will hopefully convince that a careful reading of the essays is called for. Second, I'd like to consider Fischer's claims in his essays relative to those of the IMF's critics. On the issues of greatest importance from the financial crises of the 1990s, both Fischer and the IMF's critics make logically consistent arguments with little empirical support. I will provide a review of the recent empirical literature to illuminate what evidence has been found to support one or the other side of these arguments.

I begin with a review of Fischer's essays on stabilization policy and poverty in parts I and II. I then turn in part III to IMF anticipation of and response to financial crisis. First, Fischer's essays on the topic are reviewed; then, the claims of some of the IMF's critics are presented as contrast. The controversial issues of part III can be resolved only through empirical investigation, and in part IV I provide a review of the evidence in support of – or counter to – the assertions of Fischer and the IMF's critics. Part V provides conclusions and suggestions for follow-on empirical research.

I. Fischer on macroeconomic stabilization policy.

Fischer had strong academic credentials throughout international macroeconomics prior to joining the IMF, but his comparative advantage was surely in analysis of the economic costs of inflation and disinflationary policy. The IMF proved an excellent place to advance his understanding (and ours) of these phenomena. Essays 7 through 12 in the

book are the fruits of that continuing research program. In Essay 7, he addresses the importance of central bank independence to inflation reduction and elimination. In Essay 9, he (with Ratna Sahay and Carlos Vegh) provides an empirical evaluation of the causes of high inflation and the economic costs of disinflation. In Essay 10 (with David Burton) he explores the techniques involved in ending moderate inflations in developing countries. In Essay 12 (also with Ratna Sahay and Carlos Vegh) he examines the linkage between disinflation and economic growth in transition economies.

His research design in this set of papers is largely quantitative. He and his co-authors collect extensive information on inflation, growth, fiscal balance and other macroeconomic variables for a large set of developing countries. They examine the partial correlations among the variables through a series of least-squares regressions. The regressions are not constructed for formal hypothesis testing, but once the coefficients are derived the authors use their extensive experience with inflation and disinflation episodes to interpret the coefficients and offer a sophisticated explanation for the observed correlations. The basic conclusions drawn correspond to those of the "orthodox" school of stabilization policy: that inflation imposes costs on the population of the economy, that elimination of inflation depends upon elimination of fiscal deficit spending, and that reduction of inflation to single-digit levels is a precursor to sustained economic growth.[2]

Essay 12 (entitled Stabilization and Growth in Transition Economies) illustrates this approach nicely. First, the authors collected information for the period 1989-1994 for the 26 countries considered to be in transition. Their access to information through the IMF surveillance activities in these countries was extraordinary, and the empirical work benefited from that access. They dated the beginning of stabilization policy in each country based upon the estimates of IMF staff. This created an "event study" design, with the actual year of stabilization policy redefined to year 0 for each country. To determine the causes of inflation and of economic growth the authors regressed these variables on an indicator of the type of exchange rate regime, on the ratio of fiscal surplus to GDP, and on a cumulative liberalization index as well as country-specific dummies. They concluded that a fixed-exchange-rate regime and economic liberalization "were conducive to" higher economic growth, while a combination of a fixed-rate regime and fiscal surplus leads to lower inflation. Reversed causality -- e.g., that faster growth or reduced inflation made maintenance of a fixed exchange rate possible -- was not considered. They then provided a nuanced and sophisticated interpretation of the potential theoretical links between inflation and economic growth that supported these stylized facts.

These are essays that highlight Fischer's ability to pose a policy question and take the question to the macroeconomic data. While some readers may find fault with the econometric design, the papers provide an excellent service in uncovering the stylized facts of inflation and stabilization policy as observed in developing and transition economies. Fischer and his co-authors then tie those stylized facts to the policy history of these countries in a way only possible with long practical experience. All in all, this

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[2] The contrast between "orthodox" and "heterodox" approaches to stabilization policy can be found in Bruno, Di Tella, Dornbusch and Fischer (1988).

group of papers represents an important first step in distinguishing among theories of stabilization policy.

II. Policy Reform and the Poor.

The IMF has traditionally focused its advice to developing countries upon policies to achieve macroeconomic stabilization and continued access to world financial markets. These were seen as essential to achieving rapid economic growth, and growth was taken as the pre-requisite for poverty reduction. Fischer echoes this view in Essay 16: "...macroeconomic stability is essential if growth is to be sustained and permanent progress made in the attack on poverty." (p. 504).

In Essay 14, Fischer (with William Easterly) provides empirical evidence of the impact of inflation on the poor. He uses two approaches. The first is to analyze the results of a survey administered to individuals in thirty-eight countries (nineteen industrial, nineteen developing) to measure the degree to which inflation is disproportionately perceived as a burden on the poor. The second is to examine country-level data on inflation, poverty and income inequality for evidence that inflation and the incidence of poverty and inequality are positively correlated. The results support the authors' conclusion: "inflation makes the poor worse off". (p. 482) The use of direct polling information from individuals is a useful introduction of subjective indicators of economic cost of inflation into the discussion of the impact of stabilization policy.

Macroeconomic stabilization is a first step to poverty reduction, but is not sufficient from Fischer's perspective. His audience in Essay 16 is a group of policy-makers in India in March 1995, and his message is a simple one – continue economic reform to reduce the incidence of poverty. He notes four areas in which further reform is necessary: human-capital investment, labor market liberalization, agricultural market liberalization, and macroeconomic stabilization. Why? "*The prime aim of policy must be to achieve sustained growth, for there can be no permanent improvement in the living standards of the great bulk of the population without continuing growth*". (p. 505, italics in original). The essay does not provide statistical analysis to support the supposed link between the proposed reforms and the reduction in poverty.

These essays provide a useful introduction to Fischer's macroeconomic approach to poverty. In section IV below I consider statistical evidence from other sources on the impact of IMF programs on the poor.

III. Identifying and Managing Financial Crises: the IMF and its Critics

While Fischer's academic credentials served him well in his post at the IMF, he was quickly drawn into policy debates far from his familiar turf of stabilization policy. As a leader of the IMF during a time of great controversy, he was often tasked with the responsibility of responding to the IMF's critics. A number of the essays in the book were written in reaction to criticisms of the IMF or in response to suggestions of reforms for the institution. In this section I'll first draw from the essays to sketch Fischer's view of the functions of the IMF and his conception of the problems facing developing countries in the 1990s. I'll then summarize the criticisms of the IMF from the outside.

A. The IMF as viewed by Fischer. When Fischer explains the role of the IMF in these essays, he returns again and again to Article I in the IMF Articles of Agreement.[3] As defined in Article I, the purposes of the IMF are to (p. 114):

I. Promote international monetary cooperation through […] consultation and collaboration on international monetary problems.
II. Facilitate the expansion and balanced growth of international trade.
III. Promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.
IV. Assist in the establishment of a multilateral system of payments […] and in the elimination of foreign exchange restrictions that hamper the growth of world trade.
V. Give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with the opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity.
VI. […] Shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.

The IMF has both *ex ante* and *ex post* instruments to achieve these purposes. When there is no crisis, the IMF seeks to maintain exchange stability through surveillance of macroeconomic policy of members and consultations with members on macroeconomic policy reform. These not only serve as technical assistance to the member country, they also increase the stock of information available to participants in international financial markets. *Ex post*, when crisis has arrived, the key instrument in IMF response has been the IMF-supported program: a financial credit provided to the member country to be disbursed in tranches if the member country meets policy-reform conditions set out in the program agreement. The credit is an application of V. above, while the conditions attached to the program are designed to achieve VI.

B. The Problem: the evolving international financial system. Fischer took reform of the international financial system as the starting point of Essay 6 (Reforming the International Financial System). Reform was necessary, he said, because

- international capital flows to emerging markets are too volatile, subjecting recipient countries to shocks and crises that are excessively frequent and excessively large, as witnessed by the massive recessions in the East Asian crisis countries in 1998;
- There is too much contagion in the system – a point that was argued by many during the East Asian crisis, but which became uncontestable after

[3] He refers to Article 1 in Essay 2: "The IMF and the World Bank at 50" (p. 39), Essay 3: "The IMF and the Asian Crisis" (p. 72), and Essay 4: "The Role of the IMF" (p. 114).

> the Russian devaluation and unilateral debt restructuring spread the crisis to Latin America (p. 139).

He recognized that these statements are difficult to demonstrate with statistical significance, but held them as maintained hypotheses for his argument.

He views the problem of crisis as that of policy-making under uncertainty. There are "good" and "bad" equilibria, both attainable under current economic conditions, and the one achieved will depend upon the perceptions of financial-market players (p. 135). The "good" equilibrium can be sustained by convincing investors of the recipient country's sound economic condition. When a "bad" equilibrium nevertheless is observed, the government's crisis management will require steps to change perceptions as well as (or in place of) revisions to inappropriate macroeconomic policy.

Fischer's prescriptions for sustaining a "good" equilibrium are intuitive. Central banks in either recipient or source country can lessen the danger due to adverse shocks through increased holding of foreign-exchange reserves, increased surveillance of the leverage of financial firms, and increased prudential supervision of financial-sector operations. The IMF can assist in this through providing technical advice, through surveillance of member-country performance, through broadcast of information about that performance to market participants and through its lending program. When crisis occurs (i.e., a "bad equilibrium), the primary responsibility is with the government in crisis – it must re-establish optimism about it among its sources of capital. The IMF stands ready to lend to assist the countries to adjust "without resorting to measures destructive of national or international prosperity". Fischer's major concern, in this regard, is that this lending be undertaken jointly with private lenders: in his words, he wants to "bail in" the private sector (p. 158).

What has caused the rapid growth in capital flows internationally? Fischer provides us with his explanation in Essay 5 (Capital Account Liberalization and the Role of the IMF). The proximate causes are increased information about the spreads in returns between emerging and developed markets, decreased transactions costs, stronger financial systems in developing economies, and increased liberalization of capital accounts in both advanced and developing economies. He provides a nuanced textbook explanation of the net benefits accruing to countries that liberalize their capital accounts, while arguing that countries with less-developed domestic financial markets should undertake this liberalization gradually and cautiously.

C. Fischer's solution: the IMF at the center of the system. Fischer is a skilled expositor of what I will call the IMF-centric view of international capital markets. In this view, there are inherent problems in these capital markets (e.g., volatility, contagion). The IMF has played an evolving role over the years, but its evolution has been structured to help participants (both individuals and countries) in the capital markets to avoid or adjust to these problems. In short, the international capital markets do pose problems, but the IMF is part of any solution.

Essay 1 (On the Need for an International Lender of Last Resort) illustrates the IMF-centric view. He begins with a review of the literature on "lender of last resort" functions. He highlights the moral hazard introduced into private lending and borrowing decisions by the existence of the lender of last resort. He then transfers the concept to the international economy, and concludes that the IMF is an international lender of last resort already in most respects. He acknowledges the moral-hazard consequences of the IMF's role, and draws upon the existing literature to define amendments to IMF lending that will reduce the danger of international financial crisis. He also points out that the IMF had introduced the Supplemental Reserve Facility (in 1997) and the Contingent Credit Line Facility (in 1999), and that these embody reforms designed to minimize moral hazard.

In Essay 3 (The IMF and the Asian Crisis) Fischer addresses the critics of IMF-supported programs during the Asian crisis. Fischer is an unrepentant defender of the design and implementation of IMF-supported programs for crisis management. As he said about the programs for Asian-crisis countries:

> "I … argue that the Fund's macroeconomic advice in Asia is appropriate to the circumstances of individual countries; that the structural changes in these economies supported by IMF programs are necessary for the sustainable return of growth; that IMF lending should be conditional on changes in policy and not too easily available; and that while the existence of any insurance – and the IMF's provision of backstop financing does provide insurance to its members and the markets – produces moral hazard, most lenders to the Asian countries in crisis have taken large losses" (p. 72).

While he admits that it is possible *ex post* to conclude that there were mistakes at the margin in specific policy recommendations, he also concludes that *ex ante* the IMF recommendations were the right ones. He reminds the reader that the IMF was involved in "battlefield medicine" (p. x) during times of crisis, and that conditions that later proved to be too onerous were not initially recognized as such and were relaxed when that became clear.

D. The critics say: the IMF is part of the problem. The IMF-centric view is logically consistent and compelling, but it is not the only interpretation drawn of the events of the 1990s. In the aftermath of the Asian Crisis of 1997 and the Russian Crisis of 1998 there was a loud and concerted objection to the IMF's implementation of its *ex post* strategy.[4] Many informed observers (e.g., Sachs (1997), Feldstein (1998a), IFIAC (2000), Stiglitz (2002)) attributed the crises to IMF lending, and the collapse of the

[4] Controversy about the effectiveness of IMF-sponsored programs in the developing-country context date at least from the 1970s: Williamson (1982) surveys the early controversy, while Spraos (1986) summarizes the early case against the IMF's work in these programs as "ineffectual, misguided, mistargeted". Arbatov (1992) railed against the "neo-bolsheviks" at the IMF that set the conditions for disbursement of loans to Russia without regard to the livelihood of the citizen.

economies during the crises in part to the effect of conditions associated with IMF programs.

Sachs (1997) was quite critical of the advice given by the IMF to the governments of the Asian countries in crisis. As he put it, "The old rules and remedies don't apply in the new overseas economies. …If the currency crisis is well-managed, Asia will be able to resume its rapid economic growth. If it is managed with unthinking orthodoxy, the costs could be very high, for Asia and the rest of the world." While Fischer views the crisis as one in which a loss of investor confidence tosses the crisis country into a "bad equilibrium", Sachs views the crisis as analogous to a "run on the bank". There's only one equilibrium, and the economy will return to that if only the IMF provides sufficient funds to end the run. The IMF's insistence upon market-reform conditions in this context just deepens the loss of confidence that caused the "bank run" while causing the country to undertake unnecessary and costly policy changes.[5]

Feldstein (1998a) also viewed the IMF as part of the problem in the Asian-crisis countries. He raised three fundamental issues with regard to the IMF's role:

- The IMF recommended austerity measures inconsistent with the Asian countries' economic needs just because that is the customary policy reform.
- The IMF's conditions for disbursement of credit were too targeted, and led to micromanagement of the borrowing country's economy.
- The IMF-supported program by its nature bails out unwise private lenders and creates a moral hazard in international lending.

The first two issues are those of crisis management, and echo Sachs' criticisms. The third point addresses the IMF's central role in international capital markets, and suggests that its very operation creates undesirable incentives to private lenders and borrowers.

The International Financial Institutions Advisory Commission (2000, also known as the Meltzer Commission) was created by the US Congress in the aftermath of the Asian Crisis. The Commission released its report on March 8, 2000, calling for changes in the mission and operations of the IMF and the development banks.[6] Its recommendations for the IMF included that

- the IMF should serve as a lender of last resort to emerging economies, but only for countries having met specific economic and financial pre-conditions.
- the IMF should cease lending to countries for long-term development assistance and for long-term structural transformation.
- the IMF should write off in entirety its claims against all heavily indebted poor countries (HIPCs) that implement an effective economic

[5] Researchers in the area will recognize this as a debate contrasting the second and third generations of models of speculative attack. Dooley and Walsh (2003) provides a nice summary of that very broad literature.

[6] The arguments for reform of the IMF can be found in preliminary form in Calomiris and Meltzer (1998).

> development strategy in conjunction with the World Bank and the regional development institutions.

The Commission concluded that financial crisis was in part a product of moral hazard: the availability of the IMF-supported program leads to aggressive lending and borrowing that precipitate and deepen financial crisis. Its suggestions were designed to reduce the IMF role in international capital markets.

Stiglitz (2002) is the most polemic of these three. The tenor of his critique can be found in the following passage:

> "A half century after its founding, it is clear that the IMF has failed in its mission. It has not done what it was supposed to do – provide funds for countries facing an economic downturn, to enable the country to restore itself to close to full employment. … Worse, many of the policies that the IMF pushed, in particular, premature capital market liberalization, have contributed to global instability. And once a country was in crisis, IMF funds and programs not only failed to stabilize the situation but in many cases actually made matters worse, especially for the poor" (p. 15).

Stiglitz argues that the IMF is a part of the problem for two reasons. First, the IMF's activities and recommendations increase international capital market instability. Second, its support of countries in crisis has been counterproductive: the countries have been left worse off through following the IMF's bad advice. In the course of his argument he mentions Fischer by name -- although not favorably.

IV. What does the empirical record tell us?

Fischer and the critics take opposing positions on many issues. Interestingly, especially given the careful use of data in the essays on inflation and stabilization, Fischer's essays on the IMF role in financial crisis are largely argued in qualitative terms. The IMF's critics are typically non-quantitative as well, with points argued through reference to individual case or anecdote. Given our ever-expanding databases on international capital flows and on the impact of IMF programs in participating countries, it should be possible to settle the dispute through a check of the empirical record. As a beginning to this process, I report here on the empirical record for three salient issues in Fischer's writing: the importance of moral hazard due to IMF lending, the ability of the IMF to predict financial crises, and the effectiveness of the IMF in managing crisis.

A. What is the evidence on the moral-hazard effect of IMF lending? Fischer highlights the potential of moral hazard from IMF lending in Essay 1 (p. 15), Essay 3, (p. 87), Essay 5 (p. 129), Essay 6 (p. 156) – indeed, in nearly every essay concerning the IMF role in the international financial system.[7] Moral hazard is welfare-decreasing in theory because the country takes on excess financial obligations. This excess is due to

[7] Tirole (2002) is an excellent reference on this topic. He roots the discussion of moral hazard within the market failures of the international financial system: common agency and dual agency.

the IMF's role as insurer against losses due to financial crisis.[8] Fischer, in Essay 1, distinguishes between borrower and investor (lender) moral hazard: the former is due to over-borrowing (at a given interest rate) due to the insurance role of the IMF, while the latter is due to over-lending. In either case the country's financial obligations to the rest of the world exceed their optimal levels.[9] Fischer, however, does not view it at the center of current international crises:

> "None of this is to deny the problem of moral hazard. It exists, it always has to be borne in mind, and we need to find better ways of dealing with it. But surely investors will not conclude from this [Asian] crisis that they need not worry about the risks of their lending because the IMF will come to their rescue. Investors have been hit hard. They should have been, for they lent unwisely. But there remains the question: if it was not mainly moral hazard that led to the unwise lending that underlies the Asian crisis, what was it? The answer is irrational exuberance (p. 89).

As is evident in the previous section, the critics of the IMF's policies (e.g., Feldstein (1998a) and IFIAC (2000)) placed the moral-hazard effect of IMF lending at the center of the critique.

Both Fischer's claims and the critics' counterclaims on the importance of moral hazard are made on logical grounds, with little appeal to empirical evidence of moral hazard. Empirical tests are possible, however, and have been undertaken. The following discussion will summarize some recent research results in this area.

Empirical tests of moral hazard due to IMF programs must derive the impact of IMF support on market expectations.[10] Market prices of international obligations will include these market expectations. One logical place to search for the impact of moral hazard is in the spread between the interest rate on debt of IMF-participant countries and a risk-free rate of the same maturity in the same currency. To fix ideas, consider the credit market in country i. Define r_{it} as the rate at which individuals in country i are able to borrow in dollar-denominated debt for a given maturity at time t. While there is no exchange-rate risk to the lender, there is the risk that lenders will suffer losses due to borrower default. Define the probability of default in country i in period t as ρ_{it} Demand and supply of these funds to country i can be represented in logarithmic form as:

$$\ln(D_{Fit}) = a_{oi} - a_{1i} \ln r_{it} \qquad (1)$$

$$\ln(S_{Fit}) = b_{oi} + b_{1i} \ln r_{it} - \varphi(\ln \rho_{it} - \ln \rho_{Et}) + (f_{oi} - \alpha \ln \rho_{Et}) \qquad (2)$$

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[8] It is important to note, as Lane and Phillips (2000) do, that the analogy to insurance is not exact. When an insurer pays out after an adverse event, the payment is a grant. When the IMF responds to a financial crisis, it lends for repayment. The moral-hazard incentive then is related to the degree to which the interest rate on IMF lending falls below the commercial rate facing the country in crisis.

[9] Corsetti et al. (2003) provides an analytical model in which borrower "moral hazard" isn't in fact hazardous. In their model, the insurance function of the IMF simply facilitates welfare-increasing borrowing rather than over-borrowing.

[10] See Dreher (2004) for a more detailed summary of empirical tests of IMF-inspired moral hazard.

Demand for credit comes from lending to the heterogeneous individual borrowers with uncertain payoffs. As the interest rate for borrowing falls, the number of individuals with non-negative expected profits from borrowing is increasing.[11] The lender does not observe the heterogeneity at the individual level and cannot write the individual contract to be contingent on payoff. However, it does recognize the probability of default by country (ρ_{it}) and the average probability for all emerging markets (ρ_{Et}). The last term represents the total quantity of funds available for emerging-market lending, and it is assumed falling in the aggregate perceived probability of default in emerging markets ρ_{Et}. The expression $\varphi(\ln \rho_{it} - \ln \rho_{Et})$ indicates the reduction in international lending to country i due to an increase in country-specific default risk. The quantity of funds supplied to country i is then rising in r_{it}, falling in ρ_{it} , and for given ratio ρ_{it}/ρ_{Et} will be falling with a rise in ρ_{Et}. The equilibrium interest rate will be:

$$\ln r_{it} = [a_{oi} - b_{oi} - f_{oi} + \varphi \ln \rho_{it} + (\alpha-\varphi) \ln \rho_{Et}]/[a_{1i}+b_{1i}] \qquad (3)$$

The interest rate will be rising with the perceived risks of default in country i. It will rise as well with a rising ρ_{Et} if the elasticity of the supply of credit (α) exceeds the elasticity of relative demand (φ).

The riskless rate appropriate for country i (r^*_{it}) and the spread ($s_{it} = \ln r_{it} - \ln r^*_{it}$) can be defined:

$$\ln r^*_{it} = [a_{oi} - b_{oi} - f_{oi}]/[a_{1i}+b_{1i}] \qquad (4)$$

$$s_{it} = [\varphi \ln \rho_{it} + (\alpha-\varphi) \ln \rho_{Et}]/[a_{1i}+b_{1i}]$$

or

$$\Delta s_{it} = [\varphi (\Delta \ln \rho_{it} - \Delta \ln \rho_{Et}) + \alpha \Delta \ln \rho_{Et}]/[a_{1i}+b_{1i}] \qquad (5)$$

The s_{it} then has three potential sources. First, if country i is perceived as becoming riskier than the average emerging market, this will provide a country-specific increase to the spread. Second, if the risk of default in emerging markets is increased generally this will raise the spread in country i. Third, changes in the country-specific differences in supply and demand elasticities with respect to yield ($a_{1i}+b_{1i}$) will lead to country-specific effects on the spread.

In this simple framework, the spread reflects the real excess costs of financial transactions in this market. Moral hazard will exist if guarantees in the financial markets lower artificially the perceived risk of lending. These guarantees could come from the country-i government, and thus encourage borrower moral hazard; they could come as well from the lending role of the IMF, creating lender moral hazard.[12] Moral hazard will

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[11] The discussion of financial contracts in Laffont and Martimort (2002, p. 178) illustrates this type of uncertainty.

[12] Tirole (2002, p. 40) makes the important point that the distinction of borrower and lender moral hazard in this context is misleading. Given that the country-i government is the ultimate guarantor for both of these forms of moral hazard, it is difficult to separate the two in practice.

enter the definition of r_{it} and s_{it} through reductions in ρ_{it} or ρ_{Et} due to a change in the perceived guarantee of the debt.

There are three unobserved variables in expression (5). r^*_{it} is the riskless interest rate appropriate to country i. ρ_{it} and ρ_{Et} are the perceptions of default risk. Empirical tests for the existence of moral hazard must create proxies for each of these.

- The riskless rates r^*_{it} are typically proxied by the rate observed in Euromarkets on the same currency and maturity: denote this r^*_t.
- Country-specific default risks ρ_{it}.are typically modeled as functions of country-specific macroeconomic and policy variables.
- Emerging-market default risk ρ_{Et} in this literature is thought to depend upon general market conditions and IMF activities. If the IMF lends on demand in times of crisis, then foreign lenders will perceive less risk of default on their loans. In (5), this moral hazard will be evidenced by lower perceived ρ_{Et} than truly characterizes the market. Changes in the public perception of the IMF's willingness to lend in times of crisis will cause changes in ρ_{Et}.

An empirical test of moral hazard due to IMF lending will then measure the effects of changes in ρ_{it} and ρ_{Et} as proxied by observed changes in IMF lending behavior. Zhang (1999) conducts such a test using quarterly data from the beginning of 1992 to the second quarter of 1997. He creates 10 spreads by subtracting the Eurodollar bond yield from the yield on Eurobonds and Brady bonds from eight emerging markets. He uses these spreads as dependent variables as in (5). The effect of the country-specific risk premium $\Delta\ln\rho_{it}$ is proxied by inclusion of country-specific economic fundamentals. He models the $\Delta\ln\rho_{Et}$ by introducing a dummy variable equaling one for the period 4/1995 to end of sample and zero otherwise: a change in perception of IMF propensity to bail out lenders due to the Mexican bailout orchestrated by the IMF in 1995. Zhang (1999) found no significant effect on the yield spread of the dummy variable, and concluded that there was no increase in moral-hazard behavior in response to the Mexican bailout.

Eichengreen and Mody (2000) undertakes a similar analysis of the (undifferenced) equation (5) using quarterly data from launch bonds for emerging market countries between 1991 and 1999. There is no control for ρ_{Et}, but a number of indicators of country-specific economic health are included to proxy for ρ_{it}. The authors also control for the selection bias of choosing to issue the bond. Participation in IMF-supported programs is included as a binary variable in the selection and spread equation, and is shown to have a significant effect in increasing bond issuance and in lowering spreads. The authors interpret this as evidence of moral hazard, but are careful to note that the results could also reflect reduced probability of default due to the implementation of conditions associated with the program.

Lane and Phillips (2000) searches for the effect of IMF-induced moral hazard by investigating movements in the yield on the Emerging Market Bond Index (EMBI, and later, EMBI+). Under two strong assumptions (that all countries have identical supply

and demand parameters in the credit market, and that the EMBI includes all countries relevant to creditor calculation of ρ_{Et}),[13]

$$s_{Et} = \alpha \ln \rho_{Et} / [a_1+b_1]$$
$$\Delta s_{Et} = \alpha \ \Delta \ln \rho_{Et} / [a_1+b_1] \qquad (6)$$

The change in perceived default risk ($\Delta \ln \rho_{Et}$) is posited to occur during narrow event windows around 22 announcements of IMF-related news during 1994-1999. The event windows ranged from 2 to 10 days; the windows ended the day after the announcement, but began between one and nine days before to allow for the possibility of news leaks. The authors did not control for country-specific factors influencing the risk premium, relying upon the narrow event window to ensure that other things were unchanging. The "news" that qualified for an event window was typically the announcement of a new IMF program for a crisis country – or, in the case of Russia, the announcement that the IMF will not intervene and the country was in default. While the news pertained to a specific country, it was expected to change perceptions of default risk in the EMBI bond yield because of the information it conveyed on IMF willingness to bail out private investors. Of the 22 events considered, in 14 the yield spread moved in the direction expected from a shift in moral hazard. In four of these the size of the shift was large enough to be considered significant (including the two involved with the Russian default of August 1997) while in three of the cases with unexpected movements the shifts were also large enough to be considered significant in the unexpected direction. The authors conclude that

> "the evidence does not support the notion that IMF actions since the Mexican crisis have brought on a new era of much greater moral hazard. At the same time, market reactions at the time of the US Congressional approval of the IMF quota increase and of the Russian default are consistent with the moral hazard story. In both of these instances the effect on IMF-induced moral hazard are difficult to disentangle from other turbulent financial market events of that period." (p. 24)

The specification in (5) or (6) has the disadvantage that adjustment to changes in risk is modeled as occurring instantaneously. A more general model of the evolution of the interest-rate spread will be dynamic, with the two yields following autoregressive processes and exhibiting cointegration. The appropriate estimation equation is then:[14]

$$\Delta \ln r_{it} = a_o - a_4 \Delta \ln r_{it-1} - a_3 \Delta \ln r^*_{t-1} - (1-a_2-a_4) \ln r_{it-1} + (a_3 + a_1) \ln r^*_{t-1}$$

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[13] Under the second assumption, EMBI is created as $\ln r_{Et} = \Sigma_i \theta_i \ln r_{it}$, and the probability of default ρ_{Et} is defined similarly. Under the first assumption, $\ln r_{it} = [a_o - b_o - f_o + \varphi \ln \rho_{it} + (\alpha-\varphi) \ln \rho_{Et}]/[a_1+b_1]$ and $\ln r^*_{it} = \ln r^*_t = [a_o - b_o - f_o]/[a_1+b_1]$. Combination of the two yields (6).

[14] If the original dynamic form of the equations takes a second-order augmented VAR form

$$\ln r_{it} = a_o + a_1 \ln r^*_{t-1} + a_2 \ln r_{it-1} + a_3 \ln r^*_{t-2} + a_4 \ln r_{it-2} + a_5 \ln (\rho_{it}/\rho_{Et}) - a_6 \ln \rho_{Et} + \varepsilon_t$$
$$\ln r^*_t = b_o + b_1 \ln r^*_{t-1} + b_2 \ln r_{it-1} + b_3 \ln r^*_{t-2} + b_4 \ln r_{it-2} + \varepsilon^*_t$$

then steady state values of the two yields can be defined and substituted into the equation. This steady-state relation between r_{it} and r^*_{it} defines the cointegration of the two series. We expect $b_1>a_1$, $b_3>a_3$, $a_2>b_2$, $a_4>b_4$.

$$+ a_5 \ln (\rho_{it}/\rho_{Et}) - a_6 \ln \rho_{Et} + \varepsilon_t \qquad (7)$$

for the yield taken separately and

$$\Delta s_{it} = (a_o - b_o) - (a_4 - b_4)\, \Delta \ln r_{it-1} + (b_3 - a_3)\Delta \ln r^*_{t-1} - (1-a_2 - a_4 + b_2 + b_4) \ln r_{it-1} + (1-b_3-b_1+a_3+a_1) \ln r^*_{t-1} + a_5 \ln (\rho_{it}/\rho_{Et}) - a_6 \ln \rho_{Et} + (\varepsilon_{it} - \varepsilon^*_t) \qquad (8)$$

for the spread. Each of the coefficients is expected to be positive as defined, with own-effects dominating cross-effects at each lag. A similar specification is possible for the EMBI aggregate yields.

Kamin (2002) introduces this dynamic. He estimates a variant of (8) for monthly data from 3/1992 to 11/2001. He uses both individual-country yields and the EMBI index as dependent variables. He does not include the term in Δr_{it-1}, but uses three different proxies for r^*_{t-1} : the US Treasury bill 3-month yield, the US Treasury bond 10-year yield, and the US high-yield corporate spread. He has the lagged average credit rating and the change in the average credit rating in the EMBI countries as proxies for the risk premium term. His proxies for ρ_{Et} are four dummy variables: each taking the value one for the sixth months after the Mexican, Asian, Russian and Brazilian crises, respectively. He finds that the significant effect of the Mexican bailout is the opposite to that expected due to moral hazard – the EMBI yield spread rises significantly, other things equal. In the Russian intervention the EMBI yield spread rises significantly also, and this could be consistent with moral hazard – since the IMF was widely expected to intervene forcefully, and did not. In the Asian and Brazilian contexts, there is no significant change in the yield spread. Kamin also compares the pre- and post-1995 spreads for different risk classes of bonds; if moral hazard is increased after 1995, the spreads between risk classes should be reduced. In fact, spreads between risk classes of EMBI bonds increase. Nor are capital flows into IMF-borrower countries increased post-1995. Kamin concludes that in each of these measures, there is little evidence of the effect of moral hazard.

Dell'Ariccia et al. (2002) draws a different general conclusion from similar results to those reported above. The authors argue that the one crisis event that can truly be considered a test for the existence of moral hazard is a "non-event": the decision by the IMF and the international community not to bail out the private investors in the Russian default. In their view, this event was unexpected, was unlikely to lead to a reassessment of risks other than those of future international rescues, and changed investors' perceptions of the extent or character of future international crisis lending. They also suggest that the international financial participation in other crises (Mexico in 1995 and the Asian countries in 1997, for example) did not signal a similar seismic shift in investor expectations.

Given the results of Lane and Phillips (2000) and Kamin (2002) for the Russian episode, we can anticipate the authors' conclusion. They test a version of (5) that introduces the possibility that $\Delta \ln \rho_{Et}$ was significantly increased in the post-Russian-default

environment. The authors' hypothesis is that their coefficients in the post-default period will be larger than in the pre-default period. They use two datasets of yields on individual-country bonds, and reach the same conclusions: there are significant differences in the coefficients post-default, these differences in aggregate lead to a higher risk premium other things equal. The variance in spreads (compressed under conditions of moral hazard) is significantly larger in the post-default period. When the authors redo their analysis for the Mexican bailout, they do not (just as in Zhang, Lane and Phillips and Kamin) find a significant increase in moral hazard. They conclude, then, that moral hazard was a feature of the international financial market prior to the Russian default. After the default, the depressed yield spreads and compressed variation in spreads were raised and expanded, respectively, as investors priced more accurately the costs of default on international bonds.

Evrensel and Kutan (2004) test for the existence of IMF-related moral hazard in the bond-market spreads of Korea and Indonesia in the years 1996-2003. The model is a variant of (5), with US-dollar denominated bond spreads (undifferenced) measured on a daily basis as dependent variables. The authors include percent changes in nominal exchange rate and stock market returns as explanatory variables. As in Lane and Phillips (2002), they create proxies for ρ_{it} and ρ_{Et} through construction of binary variables taking the value one when news is released about IMF programs either in the home country (ρ_{it}) or in other countries (ρ_{Et}). News of IMF program approval and disbursements for Korea, Thailand and Indonesia is used. Each country's equation is estimated separately, and is reported both in ordinary least squares and in GARCH form. The authors can not reject the "no moral hazard" null when other countries' information is used – in fact, news of an IMF program in one of the other countries drives up spreads significantly in both Korea and Indonesia. They did reject the null in favor of the "moral hazard" alternative for own-country news. This interpretation of the results may be too far-reaching, however. While the regression results indicate that perceived default risk ρ_{it} falls with own-country announcements, this may not be due to an internalization of an IMF guarantee associated with the news; it may also be due to the market perception that the conditionality associated with the IMF program will lead to improved economic performance.

Haldane and Scheibe (2004) approach the question of moral hazard from the investor side. If IMF intervention increases the perception that the investor will be able to recover its funds from a borrowing country in crisis, then the stock prices for banks with large exposure to crisis countries should rise by more, *ceteris paribus*, than stock prices for banks with less exposure. The authors examine the response of stock prices of seven UK commercial banks in five-day windows bracketing 25 "events" associated with increased IMF intervention, and one "non-event" – the Russian default. They conclude that both returns and excess returns on UK bank stocks rose in response to these events, and those with larger exposure to emerging-market borrowers rose by significantly more.

There is a potential confusion of effects here, as the authors recognize: the bank stocks may rise due to moral hazard (i.e., reduced ρ_{Et}) or they may rise due to a reduction in the potential of country-specific default (i.e., reduced ρ_{it}) due to the policy prescriptions of the IMF-supported programs. The authors include as a regressor the yield spread on

emerging-market bonds (s_{Et}) to proxy for that real hazard, and find that both the yield spread and the exposure variable remained significant determinants.[15] Given the model of (5), this raises difficulties in interpretation – the yield spread in that model picks up both real and moral-hazard channels. The continuing significance of the IMF announcement variables suggests that expectations of future benefits from IMF activity enter the stock market separately from the impact of the announcement on yields.

As the authors note, these results are necessary but not sufficient indications of creditor moral hazard. A rise in bank stock price in response to an IMF program is an indication that the market views the existing stock of loans as more valuable. No evidence is provided, however, that this higher valuation of current loans triggered increased lending to the program countries – and it is this increased lending that is associated with moral hazard.

In addition to moral hazard for lenders, Fischer in Essay 1 mentions as well a moral hazard for the borrowing country: that the availability of IMF credit will lead to over-borrowing. Fischer believes that this effect is likely to be small. Conditionality attached to IMF borrowing and the threat of being voted out of office are two important costs of IMF borrowing (p. 27) that should dissuade the frivolous borrower.

Dreher and Vaubel (2004) consider the evidence of borrower moral hazard. Their hypothesis is a direct one: that the greater availability of IMF funds creates an incentive to run larger budget deficits and to have more rapid money creation. They examine a panel of annual data from 106 countries over the period 1971 to 1997, with dependent variables the ratio of government budget deficit to GDP and the rate of expansion of M2. Explanatory variables include previous-period real GDP growth, changes in the terms of trade, an openness measure, exchange-rate overvaluation, and a dummy variable for election year, the LIBOR rate and a dummy variable for SAF/ESAF eligibility. The hypothesis of moral hazard is tested through inclusion of the degree to which the country's ability to borrow from the IMF was exhausted in the previous period. The authors conclude that, other things equal, the exhaustion of IMF quota leads to a significant reduction in the budget deficit ratio and to a significant reduction in the rate of expansion in M2, other things equal.

While the reasoning is logical, the authors run afoul of the distinction between moral hazard and crisis management. While the results reported could be evidence of moral hazard in government activity, they are just as likely to be the impact of the real effect of conditionality on government behavior. The variable used to measure moral hazard could be interpreted as the amount of funds remaining with the IMF for that country to draw down, and thus a form of insurance: however, it could also be interpreted as a measure of the degree of implementation of IMF-supported programs within the country.

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[15] There is an econometric problem with such an approach, since the yield spreads are potentially contemporaneously determined with the bank-stock excess return. The authors do not investigate this, but claim that the bias if any will reduce the likelihood of concluding that creditor moral hazard exists.

In sum, is there evidence of moral hazard from IMF activities? The empirical evidence is not strong in its favor. Some studies reject the hypothesis. Other find evidence in favor, but that evidence is consistent as well with alternative explanations. It is also striking that the Contingent Credit Line Facility introduced in 1997 by the IMF as a mechanism to minimize the negative effects of moral hazard was eliminated in 2003 after six years in which not one country took advantage of its availability.

As the preceding model suggests, some ambiguity in empirical results is unavoidable in a macroeconomic setting: the concept is based upon unobserved conditions of "overlending" and "too low" interest rates. Just as in the related literature on the "catalytic effect" of IMF lending, empirical research typically dissects the observed macroeconomic outcomes of the international credit markets for evidence of a marginal shift due to IMF activity.[16] The research designs of Eichengreen and Mody (2000) and Haldane and Scheibe (2004) offer the greatest promise, as they investigate this microeconomic concept within a microeconomic framework. Until more detailed empirical research is conducted, however, the jury is still out.

Fischer, characteristically, does not advise waiting until the final word is in. In Essay 6 he argues that the IMF should introduce procedures to "bail in" private lenders when it plays its role of crisis manager (p. 156). He also speaks approvingly of Jeffrey Sachs' recommendation that a bankruptcy rule be developed on an international scale in order to facilitate burden-sharing in debt workouts (p. 159).

B. How well does the IMF do in predicting and preventing financial crises? In Essay 4, Fischer provides his best defense of the IMF in the testimony he gave to the International Financial Institutions Advisory Commission. One of his major points was

> "The IMF is much more than a crisis lender. Through surveillance and technical assistance … it is a powerful force for good macroeconomic policies and the prevention of crises throughout the world." (p. 99)

The critics of the IMF beg to differ, as noted earlier. This raises important empirical questions: to what extent are IMF surveillance, macroeconomic projections and technical assistance effective in preventing crisis?

Surveillance. To put in place an early-warning system for international financial crisis, it is necessary to have continual surveillance of countries at risk to crisis. As Fischer notes in Essay 6, the IMF is ideally located for such surveillance. Each year the IMF staff members meet with the member-country government in an "Article IV" consultation on the state of the country's economy. The staff's report of that consultation is then presented to the IMF Executive Board. For each country, a Public Information Notice (PIN) is prepared by the Chairman to summarize the Board's discussion of that Article IV report. Each PIN is published unless the country government objects, and this dissemination of information will be a necessary part of an early-warning system. The

[16] Evidence on the catalytic role of the IMF in international credit markets is summarized in Bird and Rowlands (2004).

IMF also disseminates information on global markets through its bi-annual World Economic Outlook and annual International Capital Markets reports.

The Independent Evaluation Office (IEO) was set up by the IMF to serve as a quasi-independent auditor of IMF activity. In 2004, the IEO released its report entitled "The IMF and Recent Capital Account Crises: Indonesia, Korea, Brazil" (IEO 2004). In it are included these comments on IMF surveillance:

- [In Indonesia,] IMF surveillance did identify the vulnerabilities in the banking sector that would later become crucial to the evolution of the crisis, but it underestimated the severity and the potential macroeconomic risks posed by them (p. 1).
- In Korea, IMF surveillance failed adequately to identify the risks posed by the uneven pace of capital account liberalization and the extent of banking sector weakness, owing to the adoption of a conventional approach that focused on macroeconomic variables (p. 2).
- In Brazil, IMF surveillance was successful in identifying the key vulnerabilities that were at the core of the crisis, in part owing to the fact that they were largely macroeconomic in nature. However, it progressively downplayed the scale of overvaluation, and had little impact in persuading the Brazilian authorities to take sufficient corrective action even in areas where the diagnosis was correct (p. 2).

Two systemic problems were identified in the study. (1) IMF surveillance, to the extent that it is limited to macroeconomic performance, will miss structural or institutional causes of crisis; (2) Even if the IMF surveillance is on target, it may have difficulty in persuading the member country to adopt reforms in the absence of a crisis.

Fischer, while a staunch supporter of the IMF surveillance role, anticipated the second problems. In Essay 6, he concludes that "it is necessary to be realistic about what can be achieved through enhanced surveillance. Sometimes what is missing is not information, but the recognition of what the information means." (p. 154)

Projections. One important component of both surveillance and program design will be the ability to project the implications of policy reform today on performance in future years. Atoian, Conway, Selowsky and Tsikata (2004) study the accuracy of IMF projections through the use of an internal IMF data base. These projections are created by IMF staff for 175 IMF-supported programs approved in the period 1993-2001. Each projection is based upon the country's initial situation and upon the predicted impact of reforms agreed upon in the context of the IMF program. The projections are drawn from the Monitoring of Arrangements (MONA) database maintained by the IMF.[17] The data on historical outcomes are drawn from the "World Economic Outlook" (WEO) database

[17] When an IMF program is approved, the IMF staff uses the best statistics available at that time for current and past macroeconomic data to create projections for the evolution of those variables over the following years. These projections represent the "original program" projections for that IMF program

of the IMF as reported in June 2002. The authors decompose the difference between predicted and historical into four components: IMF staff using a different model than is found in the data, IMF staff not having accurate measures of initial conditions, IMF staff not accurately predicting future policy choices of the participating government, and random errors. The authors find that the first three reasons explain 59 percent of deviations between projected and historical current-account ratios, and 71 percent of deviations in fiscal surplus ratios.

There were significant differences in the findings for the fiscal-surplus ratio and the current-account ratio. For the fiscal-surplus ratio, the significant reasons for inaccurate projections were using the wrong model and too-rosy predictions of policy reform by the participating government. The IMF staff model was characterized by gradual fiscal-account adjustment, both in response to contemporaneous current-account shocks and to long-run imbalances, while the model revealed by historical data was characterized by more rapid adjustment to both types of imbalances. Further, the staff model's projected response was concentrated in the first year of the program, while the historical response to shocks was roughly equally proportioned across the first two years. By contrast, the deviations of projected from historical current-account ratios were largely due to inaccurate measure of initial conditions – i.e., using data in need of revision.

There is also ample evidence that IMF projections are quite inaccurate. While the projections outperform a random walk most of the time, they are not much better. The implication for IMF ability to predict crisis is straightforward – if these projections are the best possible within the IMF, they leave great room for improvement.

Easterly (2002) approaches this question from a different direction. The IMF has traditionally used a "blueprint" known as financial programming in its design of macroeconomic programs for participating countries. This "blueprint" is based on "a simple flow of funds accounting framework of key macroeconomic relationships". (Mussa and Savastano, 1999). Easterly posits that financial programming can be summarized in the expression and measurement of three identities: the monetary identity, the balance-of-payments identity, and the fiscal identity. Easterly points out that in practice the identities are not balanced due to statistical discrepancies. The typical assignment of causality used in forecasting with these identities is not found to hold. The coefficients of simple behavioral functions in financial programming are not stable across countries and over time. This leads to the unfortunate feature that growth predictions based on the model in his sample perform more poorly than a random-walk assumption. Easterly's conclusion: "accounting identities do not a macro model make".

Fischer recognizes that IMF macroeconomic programming is not perfect. In a related context, he states "mistakes are inevitable, especially when policy decisions have to be made in the heat of a crisis" (p. x). The evidence in this section suggests that the IMF still has room for substantial improvement in this aspect of its work.

Creating an early-warning mechanism for crisis. Fischer states (p. 128) that the combination of surveillance and technical assistance gives the IMF the ability to

anticipate some, but not all, financial crises. Whether this is in fact possible is an empirical question, and one that has become a cottage industry within the IMF. Kaminsky, Lizondo and Reinhart (1998), Berg and Patillo (1999), Kumar et al. (2003) and Caramazza, et al. (2004) have devised empirical techniques to predict the occurrence of crisis. It has also become a popular activity outside the IMF: Goldstein et al. (2000), Kamin, Schindler and Samuel (2001) and Komulainen and Lukkarila (2003) also provided early warning systems.

The first step in each of these is a definition of crisis. There is a great deal of disagreement within the literature on what in practice characterizes "a time of crisis". Frankel and Rose (1996) defined a crisis as one in which the year-over-year nominal exchange rate depreciates by more than 25 percent, and exceeds the previous period's change by at least 10 percent. Kaminsky, Lizondo and Reinhart (1998) defined a crisis using a weighted-average indicator of nominal exchange rate depreciation and percentage change in foreign-exchange reserves; the crisis occurs when the indicator is more than 3 standard deviations from its mean. Kamin, Schindler and Samuel (2001) defined a crisis using a similar weighted average formula, but including percentage change in real exchange rate with the percent change in foreign-exchange reserves. Observations of this index greater than 1.75 standard deviations are defined crisis periods.

This differentiation in crisis definition leads to both a differing pattern of crisis and a different number of periods defined as crisis. Kamin, Schindler and Samuel (2001) calculated crisis indicators for a sample of 18 emerging economies between 1980 and 1999 using the three definitions. Their calculation of crisis-years by region is given in Table 1.

Table 1. Variations in definitions of crisis.

	Using the definition of Kamin et al. (2001)	Using the definition of Kaminsky et al. (1998)	Using the definition of Frankel and Rose (1996)	Total number of countries considered
Latin America	35	19	31	8
East Asia	22	11	9	5
Other Emerging	25	10	18	5
Total crisis years	82	40	58	18

Source: Kamin, Schindler and Samuel (2001, Tables 2)

As was evident from the definitions given above, the Kamin, Schindler and Samuel (2001) crisis definition includes a larger number of country/years than does Kaminsky, Lizondo and Reinhart (1998), with the Frankel and Rose (1996) definition falling in between.[18] Not surprisingly, the Frankel and Rose (1996) definition, created prior to the

[18] The Kaminsky, Lizondo and Reinhart (1998) cut-off criterion of 3 standard deviations above the mean is associated with 99.87 percent confidence under a normal distribution. The Kamin, Schindler and Samuel (2001) cut-off criterion of 1.75 standard deviations above the mean is associated with 95.99 percent confidence under a normal distribution. It is evident that the distribution is not normal: given the preceding percentages, and the sample of 360 country-year observations, there should around six crisis

Asian crisis, is much less likely on average to identify a crisis in Asia than the others, but more likely to identify a crisis in Latin America.

Second, the early-warning mechanism must use available information to predict the crisis. There are univariate and multivariate approaches to prediction.

- Kaminsky, Lizondo and Reinhart (1998) used a univariate approach: it chose a single leading indicator of financial crisis and then searched for the critical value of that indicator for each country that minimized the ratio of false crisis signals to true crisis signals. The authors repeated that procedure for many different leading indicators, but considered each independently of the others.
- Kumar, Moorthy and Perraudin (2003), by contrast, took a multivariate approach. Estimation in this case used a fairly standard discrete-choice model. If y_{it} is the indicator of financial crisis, then there is an unobserved variable y^*_{it} indicating the underlying economic condition of country i in period t. If that unobserved variable exceeds zero, then the economy is expected to be in crisis. The y_{it} will be one for those countries.

$$y^*_{it} = X_{it-1}\beta_E + Z_{it}\beta_I + \varepsilon_{it} \qquad (9)$$

$$y_{it} = \begin{cases} 1 & \text{if } y^*_{it} > 0 \\ 0 & \text{otherwise} \end{cases} \qquad (10)$$

Given the definitions of crisis outlined above, the specification (9) is a reduced-form specification of foreign-exchange market equilibrium, and extreme values of y^*_{it} will represent exchange-market crises. The practitioners of this approach in the literature will generally separate the determinants of y^*_{it} into two groups. The first group (indicated by X_{it-1}) includes the domestic determinants of crisis: examples in the literature include the prior growth rate in GDP, the prior fiscal deficit as a percent of GDP, the prior growth in bank credit or M2, and the prior external debt position of the economy. All of these indicators are lagged one period. The second group (indicated by Z_{it}) are the contemporaneous external effects of the world economy on an individual country's propensity to crisis. Variables considered here typically include the growth in industrial economies, the US interest rate, the percentage change in the terms of trade. The coefficient vectors β_E and β_I are assumed to be common to all countries, although various authors have estimated it also for geographically disaggregated groups (e.g., Latin America, East Asia, Eastern Europe).

A fundamental difficulty with empirical early-warning mechanisms arises from the differing frequency of data. While some relevant data are available with high frequency (e.g., exchange rates, monetary aggregates, inflation estimates), other relevant variables are only available on an annual basis for most emerging markets (government deficit,

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observations for Kaminsky, Lizondo and Reinhart (1998). (Since the calculation is done on a monthly basis, the indicator in effect has 12 chances to categorize a country-year as a crisis year.)

current account, GDP). Researchers have chosen two different strategies for dealing with this mismatch. The majority (Kamin, Schindler and Samuel (2001) is a good example) has chosen to use the observations on the exchange rate and reserves to derive a high-frequency indicator of crisis. Then, if the crisis indicator is positive for any month within a year, that year is defined as a crisis year. The early-warning system is then built around annual observations. Other authors have chosen a different design. For Kaminsky, Lizondo and Reinhart (1998), only variables sampled monthly are considered for signals. For Kumar, Moorthy and Perraudin (2003), the crisis indicator is measured on a monthly basis, and then for variables only available on an annual basis the monthly values are interpolated to provide the desired frequency of information. This approach appears to violate the spirit of the early warning mechanism, since the endpoint for creating the interpolated value is not yet known when the interpolated value is used in estimation, but the authors report robustness checks that appear to validate the results.

Can crises be predicted? It is certainly possible to create a statistical model with desirable properties that has some explanatory power for observations in the estimating sample, and each of these papers has been successful at this. The real test of success, however, is prediction out of sample. Berg and Patillo (1999) provided an excellent example of such a test. The authors drew three early-warning-system mechanisms from the literature, calibrated them on data up to the end of 1996, and then used them to predict crises in 1997. We know, *ex post*, that the Asian countries went into crisis in that year; do the mechanisms predict this correctly? The results were disappointing. Regression-based and probit-based models of crisis were "no better than guesswork" (Berg and Patillo, 1999, p. 127). Mechanisms based on the Kaminsky et al. (1998) signals approach did somewhat better than guesswork, but had large Type I and Type II errors. The authors concluded that none of these three would have greatly improved the ability to forecast the 1997 Asian crises.[19]

Caramazza, Ricci and Salgado (2004) extended the panel data approach to include financial contagion effects. The crisis variable is defined as in Kaminsky et al. (1998), but with the cut-off criterion chosen to ensure that 5 percent of the observations would fall in the "crisis" category if the distribution were normal.[20] The authors used many of the same explanatory variables found in previous regression-based analyses, but created new variables to proxy for the impact of trade and credit-market interdependence. While trade interdependence played only a marginal role, credit-market interdependence was uniformly significant as a predictor of crisis. In addition to the other factors, having a common dominant source of credit with a country in crisis was quite significant in forecasting crisis.[21]

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[19] Kumar, Moorthy and Perraudin (2003) undertook more general out-of-sample tests: they estimated a cross-country logit model for the period January 1985 to December 1993, and then forecasted crises for the period January 1994 to October 1999. Using a trading-rule criterion, the estimated forecast equations were shown to be "profitable" on average in the out-of-sample period.

[20] The non-normality of the data (or the selection bias in the sampling) is evident in the fact that 23 percent (18/77) of the observations were in fact categorized as crisis years under this criterion.

[21] Pesaran and Pick (2004) recently provided a useful logical distinction between interdependence and contagion in these empirical models. It argued that crises due to transmission of shocks from one country to another by existing trade and financial channels (interdependence) should be distinguished from a

In sum, then, the empirical results in this section can be broken into two parts. First, can anyone predict economic crisis? Early-warning systems based upon cross-country econometric estimation prove to be effective at the margin, but not perfect. This is not a shortcoming of the IMF, but of our shared understanding of financial markets. The definitions of crisis used in the literature are focused upon the foreign exchange market, and researchers' ability to forecast exchange rates remain limited. Second, does the IMF as an institution improve our ability to forecast crisis? It certainly improves the information flow from countries, as Fischer points out (p. 102), and thus should improve all actors' forecasts of member-country performance. Its use of surveillance to identify troubling macroeconomic trends was somewhat effective in recent crisis countries. Finally, the evidence from Atoian, et al. (2004) suggested that the IMF staff's ability to project future macroeconomic responses to policy reform is limited.

C. Is the IMF an effective crisis manager? When a financial crisis erupts in a member country, the IMF typically provides the first support to that country's government from the international financial system. This support takes the form of an IMF-supported program. This leads to three questions about the IMF's role as crisis manager:

- Is the IMF intervention made in timely fashion?
- Is the volume of credit made available sufficient to weather the crisis?
- Is the conditionality suggested by the IMF effective in removing the root causes of the crisis?

Fischer is quite clear in his view: "When the IMF lends in a crisis, it helps moderate the recession that the country inevitably faces. That means that the residents of that country, its corporations, and some of the lenders to that country, do better than they otherwise would have" (p. 89).

The strongest challenge to that conclusion comes from Stiglitz (2002), as the earlier quote makes quite clear. Given his arguments, he would (in my reading of his arguments) only agree with 1/3 of Fischer's position – the lenders to the country will gain, but the residents will not.

Empirical investigation of these questions would seem to be done most naturally by checking the performance of member countries in response to participation in IMF-supported programs. However, it is important to recognize that not all countries participating in IMF-supported programs are in crisis.

Two classes of borrowers. The members of the IMF can be divided into three groups: the least developed borrowers, the emerging-market borrowers, and those who never borrow. As of the end of May 2004:

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transmission from one country's performance to another only when that performance is extreme (contagion). It demonstrated econometric biases involved in using indicators of crisis as right-hand-side variables in these estimating equations.

- There were 24 industrial countries that hadn't borrowed in recent years. These contributed the overwhelming majority (83 percent) of the world lending resources allocated by the IMF.
- Of the 77 least-developed countries that qualify for Poverty Reduction and Growth Facilities (PRGF), 54 were participating.
- Of the 83 emerging-market and transition economies, 35 were in programs.

While the least-developed represent the majority of borrowers, they borrow only a fraction of the total outstanding funds. Table 2 lists the top 10 borrowers in terms of IMF resources outstanding on 31 December 2003. These 10 borrowers represent 86 percent of the total indebtedness of member countries to the IMF. Only one of them (Pakistan) is from the set of least-developed countries.

Table 2. Largest Borrowers from the IMF
(31 December 2003, billions of Special Drawing Rights)

Brazil	19.0	
Turkey	16.2	
Argentina	10.4	
Indonesia	6.9	
Russian Federation	3.4	
Uruguay	1.6	
Pakistan	1.4	(PRGF country)
Ukraine	1.2	
Philippines	0.8	
Bulgaria	0.8	
Total of top 10	61.7	
Percent of total borrowing from the IMF	85.9	
Total borrowing from the IMF	71.8	

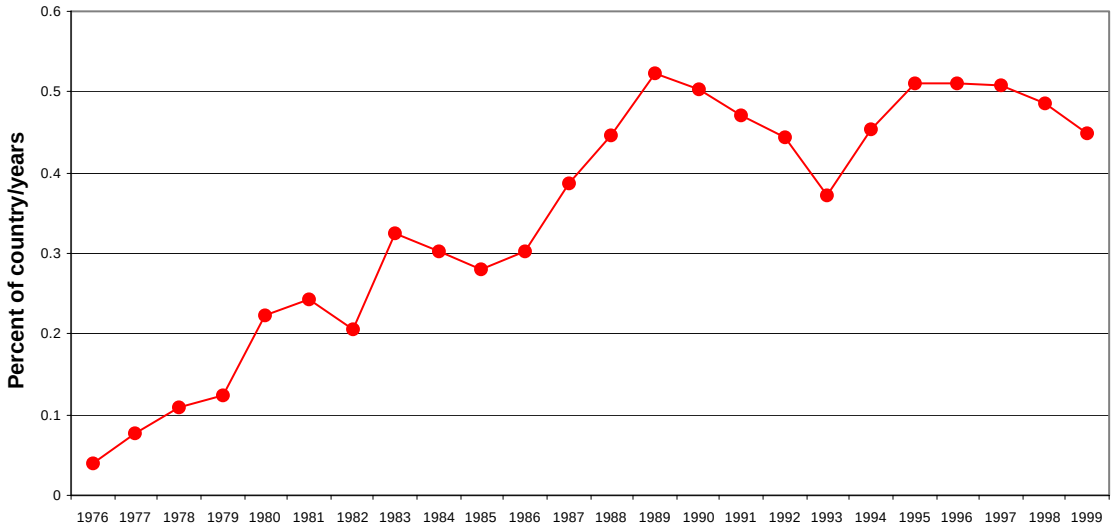
Source: 2003 Annual Report, IMF, Appendix IX, Schedule 1.

For least-developed countries, the reasons for participation in IMF-supported programs are typically systemic. The IMF offers concessional lending and technical assistance in concert with the World Bank. The goal is to create a long-term sustainable development program. Its lending to these members is longer-term, with disbursements over three years, and repayment is scheduled over a 10-year horizon. The loans carry a 0.5 percent annual interest rate. The borrowing country approaches the IMF and the World Bank simultaneously. Conditionality on these programs is determined jointly by those institutions and is geared toward long-term growth and poverty reduction. Thus, the

IMF's stated role in these programs is not one of crisis manager, but of promoter of long-term growth.[22]

Prolonged use. The trends in participation in IMF-supported programs from 1970 to today illustrate the tendency toward prolonged use. The total number of developing- and transition-economy members of the IMF rose over this period.[23] The average participation ratio – the percent of the year that a member country participated in an IMF program – is illustrated in Figure 1. Note the four periods of rapid growth in average participation: from 1976 to 1981, the beginning of the debt crisis in 1982, the period of heavy debt rescheduling from 1985 to 1989, and the beginning of lending to the transition economies of the former Soviet Union from 1993 to 1995. By 1995, the average participation ratio was over 50 percent, indicating that the average developing or transition economy spent over half the year in an IMF program. This ratio had fallen only slightly by the end of the 1990s. Thus, if we view the time period as a whole, an increasing percent of the time of an increasing number of countries has been spent participating in IMF-supported programs.

Figure 1: Participation in all IMF programs, 1976-1999



Source: IMF Annual Reports, various years.

It is useful as well to separate the period into three parts to observe the distribution of participation by country in IMF-supported programs. During the period 1976-1982, 29 of the 78 countries considered did not participate at all. Only one of these countries (Turkey) spent more than half the period in IMF programs. The years 1983-1990 were

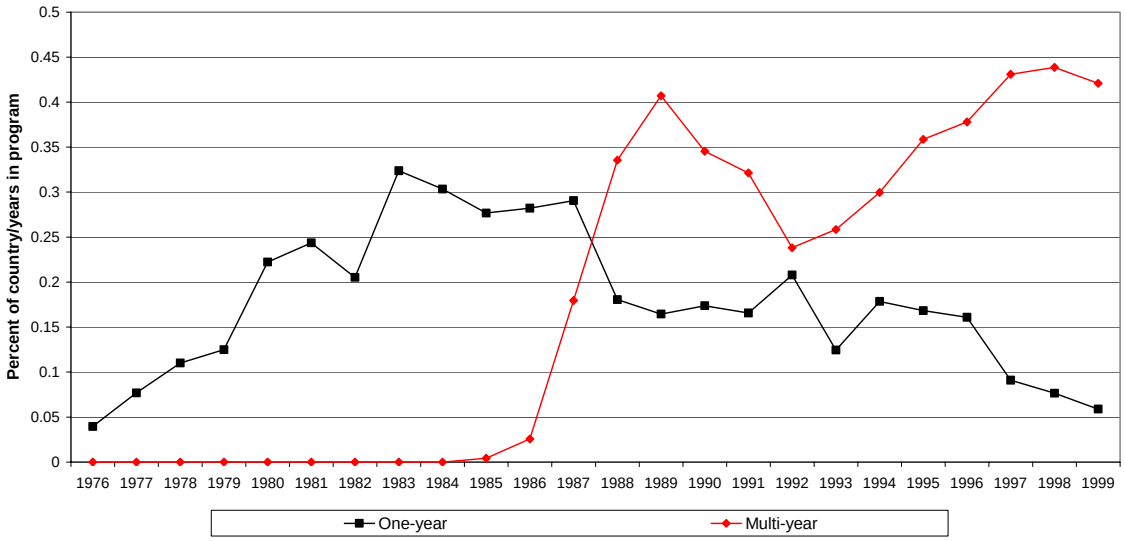
[22] This distinction may mean less in practice than it appears conceptually. As Fischer was quoted in saying earlier in the essay, macroeconomic stabilization is considered a precondition for economic growth. Thus, stabilization-generating conditionality will be a priority for the IMF in these countries as well.

[23] The data in this figure include the majority of developing- and transition-economy members: 78 in the 1970s and 1980s, rising to 84 in the late 1980s and to 99 by 1992. The data are drawn from IMF Annual Reports of the years illustrated.

characterized by more, and more sustained, participation in IMF programs. There were 13 countries (of the 78 considered) that did not participate in an IMF-supported program during the period. Twenty-six countries had more than 50 percent participation on average, with three African nations (Niger, Senegal and Togo) having average participation of between 90 percent and 100 percent.[24] In the period 1991-1999, the tendency toward participation in IMF-supported programs became even more pronounced. Only three of the 94 countries included in the sample from this period chose not to participate in an IMF program during the period. Forty-nine of the nations – well over half – participated in IMF programs for more than 50 percent of the period. Six nations (Benin, Bolivia, Guinea, Guyana, Mozambique, Uganda) were participants for more than 90 percent of the nine-year period.

The typical country has also changed the type of IMF program in which it participates. Figure 2 illustrates the percent of country/years in the sample spent in either one-year lending facilities or three-year facilities.[25] .

Figure 2: Participation in IMF programs, 1976-1999



Source: IMF Annual Reports, various years

The IMF began by offering its members the one-year program, in keeping with its self-image as a credit union. However, it became clear in the 1980s that the balance-of-payments difficulties in developing countries were more systemic in nature, and the IMF

[24] Participation here indicates only that the countries had agreed to programs with the IMF. The countries may not have drawn down the funds associated with these arrangements, and may not have satisfied the conditions associated with those programs.

[25] The one-year facilities are those known as stand-by arrangements. A few stand-by arrangements have maturities different than one year – usually less – but all stand-by arrangements are included here. The longer maturity facilities are the extended fund facility, the structural adjustment facility, the extended structural adjustment facility and the structural transformation facility. The modal maturity of these facilities is three years.

shifted its lending to permit longer-maturity facilities. These facilities retained the practice of insisting upon conditions on government policy, although the nature of the conditions evolved from those associated with IMF-supported programs in the earlier decades. IEO (2002) identified a number of characteristics of members it called "prolonged users" – those countries with an average of 7 out of 10 years in IMF-supported programs in any decade. Interestingly, the prolonged users did not have significantly lower GDP per capita (p.142). They did, however, begin from more extreme imbalances in external debt, current account deficit, and fiscal deficit than the "temporary" users. (p. 144) There were 44 countries meeting the criterion for prolonged use: 30 of them were least-developed countries. Of the countries facing financial crises in the 1990s, Argentina, Mexico and Turkey qualified as prolonged users.

Among recent papers, Bird and Rowlands (2001), Bird, Hussain and Joyce (2004) and Joyce (2004) have searched empirically for the determinants of a country's propensity to extend its use of IMF resources through successive programs. Conway (2003) is a recent extension and elaboration of that research. In Conway (2005), countries don't have single IMF programs, but rather "spells" of participation. The member government's decision to initiate or continue participation in an IMF program is modeled explicitly, and quarterly data are used to model more closely the decision horizon of the member government. When the universe of IMF program lending during the period 1973-2002 is considered, increased prior participation in IMF programs tends to shorten the duration of participation in the current program. There is also evidence of a large and significant negative effect of increased prior participation on the country's propensity to enter a new program. Conclusive? Not necessarily. There is a common difficulty in these analyses in the literature. The countries in the data sample are drawn from both groups – emerging market economies and least developed. If they represent two populations, then the results may be an odd mix of two different behaviors. Conway (2005) divides the countries into PRGF-eligible and PRGF-non-eligible, and finds significantly different results for the two groups. Most notably, the PRGF-eligible countries do not exhibit the propensity to shortened duration of future programs due to increased prior participation – just as anticipated.

Financial crises in emerging-market economies. For emerging and transitional economies, crises tend to be shorter term, financial in origin, and more extreme. The IMF offers its traditional non-concessional lending and technical assistance for balance-of-payments difficulties. These are large commitments relative to the size of the IMF, since the limitations on the size of such loans have eroded over the years. For example, Turkey's 2002 credit and loans outstanding represented a commitment 16 times larger than the country's quota. These are also shorter-term and are more sporadically allocated. Each of the 83 countries in this category can look forward to this support if an international financial crisis looms.[26]

[26] Or can they? Political scientists (e.g., Thacker (1999)) have pointed out that many of the countries receiving support from the IMF are geopolitically important to the US. The Turkey lending package of 2002 might not have been so large were there not military action looming in Iraq.

Are the IMF's funds sufficient in these cases? Table 3 provides *ex ante* and *ex post* indicators of lending sufficiency.

Table 3. Indications of Lending Sufficiency

Country, Year	*Ex ante*: IMF Financing/GDP	*Ex post*: Change in Current Account/GDP
Mexico, 1995	6	17.4
Indonesia, 1997	5	12.4
Korea, 1997	5	22.4
Thailand, 1997	3	27.1
Brazil, 1998	2	1.5
Argentina, 2001	5	16.7
Turkey, 2002	13	1.3 *

Source: International Financial Statistics, Summers (2000)
For Turkey, the *ex post* calculation is only through 2003 q2.

Ex post, they are always sufficient, since *ex post* for each country the need for financing will equal the financing obtained. However, this may involve costly (and otherwise unnecessary) structural adjustment. It will be necessary to define a measure of these costs. Also, the sufficiency of IMF funds will depend greatly upon whether they serve to catalyze additional private financing. The size of *ex post* adjustment implied by the statistics in Table 3 is in most cases much larger than the initial financing available from the IMF. (This *ex ante* percentage includes total IMF resources outstanding to the country, not just those committed during the crisis in question.)

Fischer does not address this issue, other than with the general statement that "…the IMF cannot perform a central role in crisis prevention and crisis management without adequate resources, including in particular the increase in IMF quotas now being considered by the [US] Congress" (p. 93). Definition of the adequacy of resources, and the adjusting/financing tradeoff in financial crisis, will be an important empirical extension of current knowledge.

Is the conditionality proposed appropriate? There is a long history of empirical investigation of this question. The earlier studies were reduced-form in nature: do IMF programs stimulate improvement in the current account, or accumulation of foreign exchange reserves, or resumption of economic growth? The results of those earlier evaluations are summarized in Khan (1990), Conway (1994), Ul Haque and Khan (1998) and Vreeland (2002).

Do IMF-supported programs work? This seems a simple question, but it is in fact difficult to ascertain. First, the IMF program is designed to achieve multiple goals. Second, the IMF's intervention is not the only factor working, for good or ill, to affect the borrowing country's performance: other features of the national and international economies must be controlled for. Third, the country seeking an IMF program does so

because it anticipates poor economic performance in the future: blaming that poor performance on the IMF program would be a "post hoc, propter hoc" fallacy.

Once controls are introduced for these three factors, the results of the previous research in this area can be summarized:

- The current account deficit was reduced significantly by participation in an IMF program in the 1970s and 1980s, but this effect was lessened over time.
- The growth rate of the borrowing economy is reduced significantly by participation in an IMF program in the initial year of the program, but is significantly higher in the second year of the program than in the first. The net effect is to reduce growth.
- The inflation rate of consumer prices is reduced by participation in an IMF program. In the early years (i.e., the 1970s and 1980s) this was not a statistically significant effect, but in the 1990s it proved to be significant.
- The ratio of investment to gross domestic product declines with participation in an IMF program in the initial year, but this decline is partially reversed in the second year.

This agrees with Fischer's reading of the empirical literature in Essay 4:

> "The consensus view now seems to be that in a typical program, economic activity will be depressed in the short term as macroeconomic policies are tightened, but that growth subsequently revives as structural reforms take root. Meanwhile the balance of payments improves, removing the need for further Fund financing. The impact on inflation is usually favorable (although in general not large enough to be statistically significant)" (p. 108).

These conclusions may not be germane to the debate between the IMF and its critics, because they do not differentiate among groups of borrowers. The criticisms of the IMF, and Fischer's responses to those criticisms, have focused upon treatment of emerging-market economies during financial crisis. Many of the IMF-supported programs used in the analyses summarized above were observed in the least-developed countries and date from the 1970s and the 1980s – countries and periods in which the dangers of capital flows and contagion were much less compelling. The literature to date has relied upon the "stacking" of every available IMF-supported program to get sufficient observations for statistical tests, but in doing so has perhaps lumped together apples and oranges.[27]

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[27] One exception to that description is Schadler et al. (1993). Its focus upon Enhanced Structural Adjustment Facilities (ESAFs) meant that the number of countries in programs was relatively limited. Rather than conduct cross-country regression analysis, the authors focused upon more detailed case studies of the countries' experiences. By doing so they were able to provide a more nuanced description of the effect of ESAFs on these least-developed countries, but they were not able to provide statistical tests of the significance of effects. Dicks-Mireaux et al. (2000) was an attempt to extend the analysis of Schadler et al. (1993) through econometric estimation, and uses a sample of ESAF-eligible countries.

Hutchison (2001) asks a question quite focused on the current topic. Among countries with financial crises, does participation in IMF programs lead to an improvement in economic outcomes? He sets up a model of the following structure, with y_{it} an indicator of economic performance, Z_{it} a matrix of exogenous variables for country i in period t, P_{it} the matrix of government-policy choices in period t, D^{cc}_{it-1} the dummy variable indicating a currency crisis in period t-1 for country i, and D^{I}_{t} a dummy variable indicating the country's participation in an IMF program in period t. In essence, (11) represents a reduced-form specification of economic performance; the maintained hypothesis is that financial crisis will shift the intercept of this reduced-form while leaving all other model parameters unchanged.

$$y_{it} = Z_{it}\beta_X + P_{it}\beta_G + \delta_{cc} D^{cc}_{it-1} + \delta_I D^{I}_{it} + \delta_{int} D^{I}_{t} D^{cc}_{it-1} + \varepsilon_{it} \qquad (11)$$

The data used are annual, and a panel is formed from 67 developing and emerging economies between 1975 and 1997. Hutchison recognizes the simultaneity implicit in the regression, and posits (following Goldstein and Montiel (1986) and Khan (1990)) a vector of policy response functions for P_{it}. He estimates these simultaneously with (11). Pre-existence of a currency crisis D^{cc}_{it-1} is taken as predetermined, while participation in the IMF program D^{I}_{it} is also treated as exogenous. The coefficient δ_{int} is the author's measure of the IMF's role as crisis manager.[28] The measure of crisis used is based on reserve-holdings and real exchange rate depreciation, and as such is similar to Kamin, Schindler and Samuel (2001). The cut-off criterion is defined as two standard deviations above the mean of the series. This led to identification of 160 currency crises over the period. Hutchison (2001) concludes that the IMF was not a significantly worse crisis manager than having no manager at all, but that currency crises are significantly growth-retarding and IMF programs are in general growth-retarding: $\delta_{cc} = -1.09$, $\delta_I = -0.75$, $\delta_{int} = -.20$. What wasn't clear, given the aggregation of data, was whether this result is more characteristic of the least-developed countries than the emerging-market economies at issue here. Also, there's no evidence of the dynamic effects of participation in IMF programs; the program indicator picks up only concurrent effects.

What is the impact of IMF crisis management on the poor? With the IMF's recent focus upon poverty reduction, it is natural to ask whether participation in IMF programs is associated with reduced poverty. Garuda (2000) addresses a related question: what was the impact of IMF programs on income distribution? He uses annual observations of macroeconomic variables for 39 countries (58 IMF-supported programs) between 1973 and 1991 to create a discrete-choice model of IMF participation. The predicted value from that participation equation was the propensity score. The observations in the sample are divided into three equal-sized groups by propensity score

[28] Hutchison (2001, p. 21) states that he used a Heckman correction for selection bias in correcting for the simultaneity of D^{I}_{t}, and that this correction made no significant difference to estimation. That differs from the results in Conway (1994) and Przeworski and Vreeland (2000), albeit for different data samples.

and examined for significant differences. The results of this exercise are reprinted in Table 4.

Table 4. Changes in average income of poorest quintile two years after program introduction.

	Program		Non-Program		Difference	Observations
	Mean	Number	Mean	Number		
Group 1 (0.00 – 0.18)	20.52	19	6.06	105	14.46 *	124
Group 2 (0.18-0.40)	10.06	26	6.16	98	3.90	124
Group 3 (0.40 – 0.74)	11.74	41	15.38	81	-3.64	122
		86		284		370

Source: Garuda (2000, p. 1041). Group 1 is the group least likely to participate in IMF programs based on pre-existing economic conditions, while Group 3 is the group most likely.
* indicates statistical significance. Propensity-score range in parentheses.

Garuda (2000) concludes that those countries least likely to use an IMF program (Group 1) were those in which the poor were likely to gain the most relative to the non-program countries. In the group most likely to use an IMF program (Group 3), the income growth of the poor in the non-program countries exceeded that in the program countries. Garuda does not relate his results to the economic growth rate of the countries; that would be the most direct test of the growth-poverty nexus proposed by Fischer in Essay 16, but remains an open question.

Easterly (2003) examines the link between IMF (and World Bank structural adjustment) programs and poverty for 65 developing countries between 1980 and 1998. He controls for economic growth as a determinant of poverty. He then considers the direct effect of programs on poverty (where poverty is defined by the percent of the population living on less than $2, or alternatively $1, per day). He finds no significant link between programs and the incidence of poverty. He does find that IMF programs reduced the rate at which the population entered poverty during a negative-growth episode, but also reduced the rate at which the population exited poverty during positive growth episodes.

While it is difficult to find empirical evidence of links between IMF programs and poverty, some research has targeted effects of IMF programs on observed outcomes in developing countries presumed correlated with poverty. IEO (2003) reports a careful study of the impact of IMF programs on government spending for health, education and social protection during the period 1985-2000 in over 100 member countries. Surprisingly, given the debate over the impact of IMF programs, these expenditures rose on average with the IMF programs. This was perhaps due to relaxation of the budget constraint due to IMF lending. The IMF disbursements occurred predominantly within the first two years of the program. The benefits to social spending were longer-lasting but dissipated over time, and the boost to social spending was gone within seven years.

Hajro and Joyce (2004) consider the impact of IMF programs on infant mortality as an indicator of poverty; while there is no direct effect, there is some evidence that infant mortality falls more rapidly with economic growth under an IMF program than in the absence of the program.

The empirical evidence on the link of IMF programs to poverty (positive or negative) is not strong, although the results of Garuda and Easterly suggest interesting macroeconomic dynamic effects. This should not be surprising. In most countries, the resources made available by the IMF are a small proportion of the government social-spending budget, so that direct budgetary effects will be small. The indirect effect of the IMF program through policy reform may well be larger, but it will be rather slow-acting in affecting the poverty rate. In Garuda (2000) the dynamics of poverty reduction are not considered. Easterly (2003) has a quasi-dynamic story of effects over a business cycle, but it is inferred from an essentially static estimation procedure. A dynamic modeling of the evolution of poverty, though complicated, will provide a clearer view of the contribution of IMF programs in this case.

V. Conclusions and Extensions.

Stanley Fischer has provided a valuable service in pulling together these essays from his IMF tenure. His view of the International Monetary Fund astride the fault lines of the international monetary system is both clear and compelling. While critics suggest that the IMF is part of the problem rather than part of the solution, Fischer will have none of it.

The sixteen essays of this volume and the summary of empirical evidence provide above illustrate the gulf today between the qualitative discussions of the IMF's role and the quantitative measurement of that role. In his essays on inflation and stabilization, Fischer pulls together the available data for developing countries and uses statistical analysis to provide a clear statement of the stylized facts of these phenomena. While some will argue with his research agenda, either in terms of countries considered or statistical techniques used, everyone will appreciate his efforts to bring the important policy questions to the data. His essays on the IMF's role in the international financial system lay out the important questions to ask – on moral hazard, forecasting crisis, or managing crisis – in a clear and logically compelling framework. They stop short, however, of bringing the data to bear.

It is considerate of him to leave some research for the rest of us. In preceding parts I've given a selective summary of the empirical research to date. To my mind, the most valuable direction for future research in this area will be the empirical investigation of the impact of the IMF on economic choices, either in international financial markets or in the policy decisions of participating countries. This investigation will be most fruitful if the fundamental differences between PRGF-eligible and other participating counties is recognized and incorporated into the analysis. The heated debate between defenders and critics of the IMF will remain unresolved until this empirical work is done.

Fischer does not address explicitly the political economy of international financial institutions, although his essays are studded with examples of the importance of political factors in forming economic decisions. The work of political scientists, economists and sociologists overlaps at this point.[29] The contributions of this research to deeper understanding of the role of the IMF in the international financial system will be central in any new architecture for international finance. While I have not focused upon it here, it remains crucial to our understanding of IMF activities.

Analysts of international finance disagree on much about the role of the IMF, and there is even more on which our knowledge is too limited. Stanley Fischer's volume of essays frames the debate for us in compelling fashion. By the end, we can recognize not only what he thinks of the institution but how he thinks about it as well. This makes the volume an invaluable starting point for those wishing to answer the many questions that remain about the effectiveness of IMF activities.

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6 May 2005

[29] Willett (2001), Drazen (2002), Vreeland (2003), Stone (2002) and Mayer and Mourmouras (2002) provide good starting points for a political-economy evaluation of program effectiveness. Ivanova et al. (2003) and Dreher (2003) provide statistical tests of the importance of political-economy factors in program completion.

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