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IMF Programs: Do They Work? Can They be Made to Work Better?

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Summary. — A central issue in the debate about a new international financial architecture has been whether programs of policy reform supported by the International Monetary Fund work. The Fund claims that "on balance" they do, because of their positive effect on the balance of payments. Others claim that programs are ineffective, and suggest that they should be discontinued. This paper reviews the econometric evidence dealing with the macroeconomic effects of IMF programs. It goes on to provide additional evidence and judges success against alternative criteria. Although the record is not good, the paper argues that it would be unwise for the Fund to cease lending and to abandon conditionality altogether. IMF programs need to be redesigned and refocused. The paper concludes by identifying a number of principles that should underpin reform. © 2001 Elsevier Science Ltd. All rights reserved.

Key word — IMF programs

1. INTRODUCTION

International Monetary Fund (IMF) conditionality has been a subject of debate ever since it was introduced in the early 1950s. A number of recent reports have claimed that it has become excessive, and some commentators have suggested that there may be a conditionality Laffer curve with increased conditionality being linked to diminishing effectiveness. [1] The Meltzer Commission concluded that IMF programs are "unwieldy, highly conflictive, time consuming to negotiate and often ineffectual." With a new Managing Director in place the IMF has itself undertaken a review of conditionality (IMF, 2001). Central to the debate and its implications for policy is the question of whether conditionality and the programs that embody it "work." If they do, why change things? If they do not, then should conditionality be abandoned in its present form, as recommended by the Meltzer Commission, or reformed in some way, and if so, how?

This raises the fundamental question of how to judge whether IMF programs work. [2] A narrow criterion is to focus on their balance-of-payments effects. After all, the IMF is primarily a balance-of-payments institution. With this focus in mind a recent survey of the cross-country evidence conducted by the IMF (ul Haque & Khan, 1998) claims that its programs do indeed "on balance" work. This criterion may be broadened to include the effects of programs on other additional macroeconomic outcomes such as economic growth and inflation. There is a relatively large literature that assesses conditionality in this way. The literature also encompasses studies that examine the effects of IMF programs on intermediate policy targets such as fiscal deficits, monetary growth and the exchange rate. Very little attention has been paid, however, to other potential indicators of success or failure, which move beyond the macroeconomic effects of IMF programs.

The purpose of this paper is to identify these other indicators so that a broader definition of the concept of "work" may be offered, and to see what the evidence reveals using this definition. The findings may also give a clue as to the direction in which reforms to conditionality should go. The paper only seeks, however, to be indicative rather than definitive.

The layout of the paper is as follows. Section 2 undertakes a brief review of the existing literature on the effects of IMF programs. Rather than being comprehensive, it sets out to establish broad areas of consensus and to summarize what we know. Against this background, Section 3 extends the criteria by which the effects of IMF programs may be judged. It does this by identifying institutional objectives and

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examining the degree to which conditionality as currently practiced has enabled these objectives to be realized. If the objectives are achieved this is taken to indicate that Fund programs "work." If they are not, then a less positive conclusion seems justified. Section 4 draws on the available empirical evidence combining that from the existing literature with the additional evidence presented here to discuss the implications for policy. By isolating possible shortcomings in the design of conditionality it attempts to identify areas for reform. Finally, Section 5 offers a summary and some concluding remarks about the current debate surrounding conditionality in the light of the analysis undertaken in this paper.

2. THE MACROECONOMIC EFFECTS OF IMF PROGRAMS

This section sets out to provide a brief summary of the alternative methodologies that have been used to assess the macroeconomic effects of IMF programs and the results that have emerged. It cites some of the principal and most frequently quoted studies and by so doing attempts to provide a representative sample of research in this area. There are a number of studies that offer a more detailed critical analysis of the alternative methodologies and a more comprehensive summary of the literature (Killick, 1995; ul Haque & Khan, 1998). But, for our purposes this level of detail is not required.

Underlying all research into the effects of IMF programs is the problem of the counterfactual, that is, what would have happened in the absence of an IMF program and therefore what effects can be attributed to the program *per se* as opposed to other factors. In practice, there is no completely satisfactory means of dealing with this problem. Before-and-after tests implicitly assume that other things remain constant, which they do not. With–without tests assume that it is possible to formulate an accurate view as to what would have happened in the absence of an IMF program. One way of doing this is to compare countries that have negotiated Fund programs with other countries that have not. But there is a problem in finding countries that are similar in all respects apart from the involvement of the Fund. Otherwise some attempt needs to be made to allow for differences between those countries that do and do not have programs, in terms of their economic circumstances and how policy might evolve. This is what the "generalized estimator evaluation" approach attempts to do. But the very decision as to whether or not to turn to the IMF itself implies a significant difference in the approach to economic adjustment as well as in the political environment in which adjustment takes place, and this is difficult to capture empirically.

This problem may be overcome by endeavoring to simulate the performance of an individual economy under different sets of policies. But simulation analysis encounters another problem since it relies on being able to specify a model that accurately describes how individual economies function. In fact, economies differ, and no one model is likely to provide an accurate description of all countries that might turn to the IMF (Dicks-Mireaux, Mecagni, & Schadler, 2000). Furthermore, the response to policies undertaken under the auspices of the Fund may differ from the response when the same policies are pursued independently, and on top of this parameter values may be affected by the policies adopted. A case study methodology offers another approach but suffers from problems of generalization.

Other difficulties that get in the way of an unambiguous assessment of the effects of IMF programs relate to the time period over which the effects are monitored and the range of performance indicators that are studied. There is no reason to presume that program effects follow some linear path over time or that positive effects on some economic variables will be matched by similar positive effects on others. Economic variables may move in different directions over time and better performance in terms of one variable may be offset by worse performance in another. Unless a reasonably sophisticated social welfare function has been specified, it is difficult to say whether things overall have improved or deteriorated. [3]

While the search for methodological improvement in econometric analysis of the effects of IMF programs continues, there is an accumulation of evidence from studies using different methodologies and this has gradually provided an overall picture. Results that are robust across different studies and methodologies may engender greater confidence than those that are methodology-specific, or specific to individual studies.

Without undertaking a detailed review, we can make a number of important generalizations. In terms of the key performance indica-

tors, early before-and-after studies found no significant improvement in the current account balance of payments, although both Khan (1990) and Pastor (1987) discovered significant positive effects on the overall balance of payments in more recent research. With–without tests of one form or another have tended to show stronger results for the current account (Doroodian, 1993; Gylfason, 1987; Khan, 1990). Killick (1995) uses a combination of before-and-after tests and case study evidence. His results suggest that both the overall and current account balances strengthen, especially over a three-year period, in part by import compression (rather than import strangulation) but also by relatively large increases in export volume, which rise through time. This performance was secured against a background of deteriorating commodity terms of trade.

For inflation before-and-after tests reveal a record that is generally weak, with the inflation rate increasing as frequently as it declines. The results are, however, almost always statistically insignificant. With–without tests and simulation studies suggest a better performance, although significance is at best low. The demand-reducing effects of IMF programs seem to be offset by the effects of devaluation and liberalization.

On economic growth, although many early studies found little connection, Goldstein and Montiel (1986) found IMF programs to have a significantly negative effect. Simulation tests by Khan and Knight (1982) also predicted that demand management programs similar to those supported by the IMF will have negative short-run effects on growth, although subsequent research by them suggests that these effects can be ameliorated by incorporating supply-side measures to protect investment (Khan & Knight, 1985). Conway (1994) finds significant differences between the short-run and long-run effects of IMF programs on economic growth and investment, as contemporary reductions are followed by lagged increases. Killick (1995) finds a largely neutral association with economic growth, although over a longer timeframe the association is positive (albeit of only limited statistical significance). This is somewhat surprising in light of the apparent negative effect on fixed investment, suggesting that growth has been achieved through increases in the marginal productivity of capital or that it may represent a temporary recovery from recession. Stabilization under the auspices of the Fund is generally achieved by lowering investment rather than by increasing savings. It is investment that carries the main burden of reduced absorption; private and public consumption are apparently little influenced by the negotiation of a program with the Fund (which has some bearing on the debate over the effects of IMF-backed programs on the poor). While Hutchison (2001) discovers a significant adverse effect on output growth over one to two years, Przeworski and Vreeland (2000) claim that IMF programs have an enduring adverse effect on economic growth. Meanwhile, Garuda (2000) suggests that their effect on income distribution depends on the severity of the initial circumstances in which a country turns to the Fund.

Table 1 provides a summary of the results of the principal studies as presented by ul Haque and Khan (1998). Although one can quibble about whether they have identified all the important studies, the overall picture would be widely acknowledged as reasonable. [4]

Another part of the existing literature focuses on the effects of IMF programs on the policy instruments through which an influence on final outcomes is sought. Edwards (1989) paints a rather bleak picture showing that for 1983–85 there was widespread failure to comply with either fiscal or monetary targets. For example, in no year in the study period did the rate of compliance reach 50% for the target relating to the size of the government deficit relative to GDP. Subsequent research has confirmed that at best only about a half of policy targets are achieved; in general policy variables seem to be little influenced by IMF programs with the record being weakest for monetary restraint. Thus while both Conway (1994) and Killick (1995) find that IMF programs exert a significant effect on the real exchange rate and have some impact on certain fiscal variables, although not necessarily the fiscal deficit, neither finds a significant effect on the rate of credit expansion.

What emerges from this brief survey of the existing evidence? On the positive side IMF programs do seem to be associated with a statistically significant and enduring depreciation in the real exchange rate. Perhaps connected with this, they also appear to be associated with some significant strengthening in the balance of payments. But, their impact on fiscal and monetary restraint is less significant or not significant at all, and the effects on inflation and economic growth are generally insignificant or significantly negative in the case of economic

Table 1. *Summary of empirical evaluations of the effect of fund programs*

Study	Time period	Number of programs	Number of countries	Effects on[a]			
				Balance of payments	Current account	Inflation	Growth
Before–after							
Reichmann and Stillson (1978)	1963–72	79	...	0	...	0	+
Connors (1979)	1973–77	31	23	0	0	0	0
Killick (1984)	1974–79	38	24	0	0	−*	0
Zulu and Nsouli (1985)	1980–81	35	22	...	0	0	0
Pastor	1965–81	...	18	+*	0	0	0
Killick (1995)	1979–85	...	16	+*	+*	−*	+*
Schadler, Rozwadowski, Tiwari, and Robinson (1993)	1983–93	55	19	+	−	−	+
With–without							
Donovan (1981)	1970–76	12	12	...	...	−	+
Donovan (1982)	1971–80	78	44	+	+	−	−
Loxley (1984)	1971–82	38	38	0	0	−*	0
Gylfason (1987)	1977–79	32	14	+*	...	...	0
Generalized evaluation							
Goldstein and Montiel (1986)	1974–81	68	58	−	−	+	−
Khan (1990)	1973–88	259	69	+*	+*	−	−*
Conway (1994)	1976–86	217	73	...	+*	−	−, +*
Bagci and Perraudin (1997)	1973–92	...	68	+*	+*	−	+*
Dicks-Mireaux *et al*. (2000)	1986–91	88	74	...	...	−	+*
Simulation							
Khan and Knight (1981)	1968–75	...	29	+	+	−	−
Khan and Knight (1985)	1968–75	...	29	+	+	−	−, +*

Source: ul Haque and Khan (1998).

[a] Direction of change: (+) indicates positive effect, (−) indicates negative effect, (0) indicates no effect.

* Statistically significant at the 5% level.

growth. If an objective of Fund programs is to reduce inflation and encourage growth it is difficult to argue that they work. The claim that "on balance" they do, would therefore appear to depend on the weights attached to strengthening the balance of payments as compared with other macroeconomic objectives.

Still underpinning all the existing literature is the problem of attributing outcomes to IMF programs. It may be that the counterfactual is being reasonably well captured and that the coefficients are indeed insignificant. It may also be that the findings of insignificance reflect incorrect specification of the models. The coefficients in the context of better constructed models might be significant.

The response to this could be twofold. The first could be to improve the models used to better capture the effects of IMF programs and no doubt research will continue along these lines. The second, and the one pursued here, is to look for other criteria which side-step the problem of the counterfactual and judge whether IMF programs "work" in other ways.

3. DO IMF PROGRAMS WORK? OTHER INDICATORS

IMF programs and the conditionality that they involve represent the mechanism through which the Fund seeks to achieve its institutional objectives. The Fund's Articles of Agreement envisage its assistance as being "temporary" and "revolving." The implied sequence of events is as follows. A country encounters economic problems and turns to the IMF with the "balance-of-payments need" that, according to the Articles, is a prerequisite for financial assistance from the Fund. A program of policies is negotiated that the country then implements as set out in the "letter of intent" it signs. This program strengthens economic performance in general, but in particular strengthens the balance of payments, thus providing the resources with which the Fund can be repaid. The improvement also eliminates the "need" for further assistance, allowing the Fund's resources to revolve and to be used in support of other countries.

To the extent that this is an accurate representation of the relationship between the Fund and client countries envisaged in the Articles of Agreement, two features of IMF programs emerge by which they may be judged. First, borrowing from the Fund should be a low-frequency event. Countries should be spending only relatively short periods of time under Fund programs and should not have a succession of them. Second, since conditionality is the mechanism through which the Fund seeks to strengthen economic performance, it might be assumed that programs have to be implemented and carried through to completion.

In addition to the above, a third criterion is suggested by the Fund's own pronouncements about what its programs seek to achieve. While, in part, they are designed to achieve macroeconomic stabilization and supply-side adjustment, they are also intended to catalyze other supporting capital inflows. In large measure this catalytic effect is seen as being the consequence of the signal that is supposedly transmitted by conditionality; a signal of enhanced credibility in terms of policy reform.

How well do IMF programs work in terms of these objectives? The remainder of this section examines each in turn.

(a) *Recidivism*

Members of the IMF may be divided into a number of categories in terms of their drawings; nonusers, infrequent users, and frequent users. Frequency of use may be measured either in terms of the number of programs that a country has over a specific period of time or in terms of the time spent under Fund programs. The evidence is that a relatively large number of countries have been fairly frequent users of Fund resources according to both measures (Bird, 1995; Bird, Hussain, & Joyce, 2000; Goreux, 1989). Table 2 provides data covering 1980–96 showing both the number of programs and the number of years spent under programs. By the first criterion Senegal exhibited the highest degree of recidivism with 11 programs, closely followed by Madagascar with 10, and Costa Rica, Jamaica, Kenya, Mauritania, Morocco, and Togo with nine each. By the second criterion, Jamaica was the most recidivist nation with 16 years spent in Fund programs, followed by Malawi, Togo, and Uganda with 15 years each, and Côte d'Ivoire and the Philippines with 14 years each.

Further empirical support for recidivism comes from studies that seek to explain econometrically the incidence of IMF arrangements. These commonly show that recent arrangements are statistically significant in explaining current arrangements (Bird & Rowlands, 2001a; Conway, 1994; Knight & Santaella, 1997). As noted above, however, not all countries are IMF recidivists. For some, drawing resources from the Fund is a low-frequency event. The recidivists generally appear to cluster within the group of low-income countries. Statistical analysis of their characteristics shows them to have relatively large current account deficits, low reserve holdings, low capital inflows, high rates of program cancellation, low terms of trade, high debt-service ratios, and high perceived levels of corruption (Bird *et al*., 2000).

The relatively high rate of recidivism and the quasi-permanent involvement of the IMF with some countries is not only directly at odds with one of the Fund's institutional objectives, but it may also carry indirect information concerning the extent to which IMF programs work on macroeconomic variables. Where recidivism is concentrated among low-income countries the negative effect that studies find IMF programs to have on investment and economic growth implies a vicious circle of low growth and low income, IMF referral followed by even lower economic growth. Moreover, while crosscountry econometric studies suggest that IMF programs may strengthen the balance of payments, in the case of IMF recidivists the strengthening is clearly insufficient to eliminate the balance-of-payments need which warrants further Fund support. Recidivism therefore poses questions about the degree of improvement in the balance of payments associated with IMF programs.

While infrequent users fit the pattern of usage envisaged in the Fund's Articles, the existence of frequent users and sometimes quasi-permanent users suggests that in these cases IMF programs are failing to work in terms of delivering institutional objectives. Recidivism may also be connected with another criterion upon the basis of which IMF programs may be assessed, since it more commonly occurs in countries that fail to complete previous programs.

(b) *Program completion*

When a country signs an agreement with the IMF, part of the agreement stipulates the size

Table 2. *Countries with number and years imf programs, 1980–96*

Country	Programs	Years	Country	Programs	Years
Algeria	4	5	Liberia	5	6
Angola	0	0	Madagascar	10	12
Argentina	7	11	Malawi	8	15
Bangladesh	5	11	Malaysia	0	0
Benin	3	8	Mali	7	13
Bolivia	6	11	Mauritania	9	13
Botswana	0	0	Mauritius	4	7
Brazil	3	6	Mexico	4	10
Bulgaria	5	3	Morocco	9	10
Burkina Faso	3	6	Mozambique	3	10
Burundi	3	7	Namibia	0	0
Cameroon	4	6	Nepal	3	8
Central African Rep	8	10	Nicaragua	2	4
Chad	3	6	Niger	7	10
Chile	3	7	Nigeria	3	3
Colombia	0	0	Oman	0	0
Congo Dem Rep	8	11	Pakistan	8	9
Congo Rep	3	3	Panama	6	10
Costa Rica	9	11	Papua New Guinea	3	5
Côte d'Ivoire	8	14	Paraguay	0	0
Dominican Republic	4	5	Peru	4	8
Ecuador	7	9	Philippines	7	14
Egypt	4	10	Poland	4	6
El Salvador	7	8	Rwanda	2	4
Ethiopia	3	5	Saudi Arabia	0	0
Gabon	6	9	Senegal	11	13
Gambia, The	6	8	Sierra Leone	6	9
Ghana	7	9	Singapore	0	0
Guatemala	4	4	Somalia	6	10
Guinea	5	11	South Africa	1	1
Guinea-Bissau	2	5	Sri Lanka	3	11
Haita	6	10	Sudan	3	6
Honduras	3	10	Syrian Arab Republic	0	0
Hong Kong	0	0	Tanzania	5	9
Hungary	7	9	Thailand	3	5
India	3	4	Togo	9	15
Indonesia	0	0	Trinidad & Tobago	2	2
Iran, I R of	0	0	Tunisia	2	6
Israel	0	0	Turkey	4	7
Jamaica	9	16	Uganda	8	15
Jordan	4	7	United Arab Emirates	0	0
Kenya	9	13	Uruguay	7	11
Korea	4	6	Venezuela	2	5
Kuwait	0	0	Zambia	6	7
Lesotho	5	9	Zimbabwe	5	7

Source: Bird *et al.* (2000).

of the loan and the tranches in which it will be disbursed, conditional upon compliance with a range of quantified performance criteria. There is an end date by which it is expected that the program will be completed. The degree of completion may then be measured by the extent to which the agreed credit is drawn down by this date, or by total purchases as a proportion of the total committed resources. While there is a discrete distinction between completion and noncompletion, it is more useful to think of completion as a continuum. Noncompletion occurs where less than 100% of the loan is disbursed.

Completion has sometimes been used as a proxy for policy implementation (Conway, 1994; Killick, 1995) but there are differences between the two. On the one hand, a country may fully implement the policies agreed in a program and meet all the required performance criteria but decide not to use all the Fund finance for which it is eligible. Com-

pletion, in these circumstances, understates implementation or compliance. On the other hand, another country may fail to implement fully the agreed measures and fail to comply with all the quantified performance criteria but still be permitted to draw on the agreed loan; it may still complete the program. Completion will then overstate implementation. The IMF may grant a waiver, which allows the country access to the loan in spite of its failure to meet performance criteria. This will usually happen where some unforeseen development outside a government's control has blown the program a little off course but substantial progress has still been made and the deviation appears temporary. Where the deviation is larger, the initial program may be modified to accommodate changed circumstances, or cancelled. Another program may then be put in its place.

Additional complications arise if completion is interpreted as reflecting success or failure. In principle noncompletion could reflect economic success. A country may, for example, be forced to borrow from the Fund because of a deterioration in its terms of trade. If these subsequently improve the country may opt to discontinue its purchases from the IMF, effectively allowing the agreement to lapse. Alternatively, it may be that the policy measures agreed as a part of the program turn out to be more effective than was initially assumed, either in strengthening the current account balance of payments or in inducing private capital markets to lend. The agreement may even have been signed as a precautionary measure in the hope that the resources would not be needed. Again, the Fund program may remain uncompleted because of economic success.

More frequently, however, it may be assumed that noncompletion signals a breakdown or failure of the program, with the extent of the breakdown being reflected by the extent to which the IMF loan remains undisbursed. For arrangements where disbursements amount to less than half those initially agreed, Mussa and Savastano (1999) acknowledge that "mainly these were cases where the program went off track because policies deviated significantly from those agreed with the Fund and subsequent negotiations failed to reach agreement on a modified program." But while they argue that a drawdown of 75% or more is generally indicative of success, Killick (1995) argues that the cut-off point should be slightly higher at 80%. Killick tests this threshold against available case-study evidence and finds that it consistently identifies the programs that were perceived as breaking down, and distinguishes these from the ones that were seen as successful. It also seems to be generally consistent with the Fund's judgement on eligibility, with countries using less than 80% of the loan becoming ineligible (Schadler *et al.*, 1995). Demonstrating the potential ambiguities involved, Mussa and Savastano (1999) claim that completion of an IMF program implies than in the Fund's view,

> the country made substantial and satisfactory progress towards the primary objectives of its adjustment program. . .and that the policies of the authorities were broadly in line with the (often revised) understandings reached with the IMF during the life of the arrangement (p. 17).

This is interesting since it suggests that failure to complete the program reflects unsatisfactory progress, and offers an even stiffer test for success than the one they suggest elsewhere in their paper. It also implies that waivers and modifications are granted when programs are perceived by the Fund as performing satisfactorily, in spite of a failure to comply with quantified targets, and this reinforces the view than noncompletion generally reflects poor implementation of the policies and lack of success.

How widespread is noncompletion? Table 3 presents data for 1973–97 as reported by Mussa and Savastano (1999). A number of noteworthy features stand out. First, noncompletion is indeed widespread. Over the full period only about 35% of programs were fully disbursed. Second, whereas the completion rate was fairly stable over 1973–87 at somewhere between 40% and 45%, it fell quite sharply in the two subsequent subperiods. In allowing for the bias reported in Table 3, the completion rate in the mid-to-late 1990s was very modest at probably below 20%. Third, in the most recent period over 70% of programs had a final loan disbursement of 75% or less. This compares with about 48% of programs in 1983–87 and 53% of programs in 1988–92. Fourth, in terms of full disbursement, and taking the entire period, stand-bys seem to have been slightly more successful than structural adjustment lending and much more successful than extended loans. In short, the overall record is of a downward trend in completion but with some variation according to the type of program. The most

Table 3. *Fraction of IMF loan actually disbursed under each arrangement, distribution by quartiles (x = fraction of total IMF loan disbursed under each arrangement)*[a]

	$x \leqslant 0.25$	$0.25 \leqslant x < 0.50$	$0.50 \leqslant x < 0.75$	$0.75 \leqslant x < 1.0$	Fully disbursed ($x = 1.0$)	Number of arrangements
			(in percent)			
All arrangements[b]						
1973–77	36.5	7.1	5.9	5.9	44.7	85
1978–82	19.4	16.1	10.5	12.9	41.1	124
1983–87	12.9	15.8	19.4	7.9	43.9	139
1988–92	17.5	15.1	20.6	14.3	32.5	126
1993–97[c]	27.0	19.1	26.2	11.3	16.3	141
Full period (1973–97)[c]						
Of which	21.6	15.3	17.6	10.7	34.8	615
Stand-by[c]	23.1	13.4	15.0	9.5	39.0	441
EFF[c]	33.3	22.2	19.0	15.9	9.5	63
SAF/ESAF[c]	9.0	18.9	27.0	12.6	32.4	111

Source: Mussa and Savastano (1999).

[a] Calculated as the ratio of the total purchases made to the full amount of IMF resources committed under each arrangement.

[b] Includes stand-by arrangements, EFF arrangements, and arrangements under the SAF and ESAF. Excludes STF arrangements, and drawings under the first credit tranche and the CCFF.

[c] The distribution of the ratio x for 1993–97 is blased (downward) by the inclusion of arrangements with expiration date posterior to 1997. The bias is also present in the distributions reported for the full period (1973–97).

recent evidence suggests that more than two-thirds of programs are poorly implemented and break down.

The IMF seems to argue that the poor rate of completion is no particular cause for concern. After all programs may be pushed off course by unexpected shocks and, in any case, new programs can replace those that break down. A process of program negotiation, breakdown and subsequent renegotiation seems to be accepted by the Fund as an integral part of its relationship with client countries, especially where there are substantial problems to be resolved. But, while it is not difficult to understand why the IMF might wish to present it in this way, there are compelling reasons to see the low rate of completion as a more fundamental problem.

First, and as noted above, noncompletion is inconsistent with the IMF's own Articles of Agreement which envisage countries turning to the Fund when they have severe balance-of-payments difficulties, negotiating a program of policies that they then implement and which have the effect of strengthening economic performance in such a way that the country no longer needs to call for further assistance from the Fund.

Second, negotiating programs with the IMF involves transactions costs. For many developing countries the opportunity cost is high. There could therefore be significant efficiency gains from negotiating one program that is completed and works, as compared with a series of programs, each of which remains uncompleted.

Third, IMF programs are supposed to exert their influence on economic policy and performance via the conditionality that they embody. There is little point in negotiating detailed conditionality if the policy reforms that it covers are not implemented. It is therefore inconsistent to argue that conditionality is important but at the same time that the degree of compliance is unimportant. Either the policy reforms negotiated within the context of conditionality matter or they do not. A low rate of completion would only be of little or no concern if it were unconnected with policy implementation. But, as already noted, program completion will generally be positively connected to policy compliance.

Fourth, a stated objective of IMF programs, to which we return in the following section, is to mobilize other sources of capital. Conditionality is the modality through which catalysis occurs since it is supposed to increase the credibility of the reform process by locking countries into a program of reform (Rodrik, 1996). But this will not be the case if programs are uncompleted and policy compliance is poor. Indeed, failing to complete a program may send out a negative signal to both private capital markets and aid donors.

Finally, if conditionality is well designed, its implementation should have a positive effect on macroeconomic performance. Perhaps studies that have reported conditionality as being ineffective have included countries where it is has been implemented with those where it has not. Perhaps effectiveness depends on the degree of completion. There is remarkably little evidence upon which to draw.

As noted earlier, Killick (1995) concludes that where 20% or more of an agreed loan remains undrawn by the termination date there is a *prima facie* argument that the program broke down because of noncompliance. This is broadly consistent with the Fund's own assessment (Mussa & Savastano, 1999; Schadler *et al*., 1995). Killick then uses his test of compliance to see whether countries that complied with conditionality outperformed those that did not. While he finds some evidence which seems to point in this direction, it varies across different indicators of macroeconomic performance and generally fails to pass standard tests of significance.

Using different econometric techniques, but combined with a similar approach to compliance, Conway (1994) discovers that compliance does make a statistically significant difference. He does not, however, impose a threshold for compliance and instead uses the extent of drawdown in any year to adjust his measure of participation in an IMF program. He therefore argues that spending one full year in a program but drawing only half of the available resources is equivalent to spending half the year in the program and drawing down all the available resources. It is not obvious that this adequately captures the effects of compliance since it seems to imply that there is a tradeoff between the length of time spent in a Fund program and the degree to which policies are implemented. But it is unclear why this should be so if conditionality is the means through which programs have their effects. If policy compliance is the key to success, any amount of time spent in Fund programs but with poor implementation will be ineffective. Why should a string of Fund programs that are not implemented ever be more successful than one that is? This could be the case if conditionality is not the key to success and if the Fund exercises its influence by indirectly affecting policy in some other way, or if Fund programs are important for the resources they provide either directly or via their impact on other lenders. But, as already noted, many studies fail to find a statistically significant association between Fund programs and policy variables (Conway, 1994; Edwards, 1989; Killick, 1995) and, as just noted, it is difficult to see why other lenders should be influenced positively by a country's failure to implement an agreed program of reform with the IMF.

More recently internal research within the Fund has concluded that, in the case of transition economies, compliance with performance criteria affects the outcome in terms of economic growth (Mercer-Blackman & Unigovskaya, 2000). Here the researchers make use of the Fund's database for Monitoring Fund Arrangements (MONA). They construct an index of Fund program implementation (IFI) which indicates whether performance criteria were met, not met, or only met after waivers and modifications. Not only do they find a positive connection with economic growth, but they also find that their index is closely correlated with the index of reform progress used by the European Bank for Reconstruction and Development, suggesting that conditionality is in some direct or indirect way positively associated with economic progress more broadly defined. A high score on both indices could, for example, reflect a strong commitment to policy reform. Although the available evidence is as yet far from totally convincing it seems to suggest that completion does matter. In one sense this is good news for the Fund. For if it had been found not to matter what would this have said about the design of conditionality? It would then have appeared to yield no return in the sense of improved economic performance. But in another sense it is bad news. If completion matters, it is difficult to remain indifferent about the low rate of completion of IMF programs. One comes back to the basic point that IMF programs cannot work if they are not implemented.

(c) *Signalling and catalysis*

A widely-held view both inside and outside the Fund is that IMF programs help to mobilize capital from other sources. The Fund has talked about the "three-pronged approach" of its programs, with the mobilization of external finance being one prong alongside demand restraining measures and structural reform (Schadler *et al*., 1995). More recently, Mussa and Savastano (1999) claim that "IMF-supported programs aim at restoring the country's access to foreign financing as rapidly as possible." The mobilization of "sustainable external

financing'' is seen as lying at the ''core'' of IMF programs. Dhonte (1997) argues that the Fund is able to catalyze additional capital inflows because of the signalling effect of conditionality. He maintains that predictability lies at the heart of credibility and goes on to argue that ''the need to close the predictability gap provides a renewed perspective on the role and function of Fund programs, and, in particular, of their conditionality component.'' Since he suggests that it is only fairly recently that developing countries and countries in transition have contemplated access to private international capital markets, he presents this as a ''new role'' for conditionality. He goes on to claim that the evidence is consistent with the Fund performing this role effectively.

This discussion points toward additional criteria by which IMF programs may be evaluated, and another newer dimension to the concept of whether they work. The Fund has set an objective for its programs in terms of mobilizing foreign capital and the question is whether this objective is realized.

Although the conventional argument for expecting positive catalysis in association with IMF programs is in terms of overcoming the time consistency problem, there are a number of counterarguments that make the theoretical basis for catalysis ambiguous.

First, there are legitimate questions surrounding the extent to which the conventional components of conditionality, such as restrictionary fiscal and monetary policy and exchange rate devaluation, will be associated with additional capital inflows. While higher domestic rates of interest may attract some forms of short-term capital, related declines in consumption and investment alongside the increased prospects of economic recession may deter portfolio investment and foreign direct investment. Sharply rising interest rates may also enhance the risks of corporate bankruptcy and expose the vulnerabilities of domestic banking and financial systems, and this will hardly boost the confidence of capital markets. Even exchange rate devaluation may be interpreted as indicating reduced commitment to maintaining the value of the domestic currency and may therefore signal the increased probability of further devaluation.

Second, even if foreign lenders are generally enthusiastic about the policy contents of conditionality, they may retain well-founded doubts about whether the policies will actually be implemented. Signing an agreement with the IMF does not necessarily signal a strong commitment by governments to carry through the agreed policies. In seeking to explain the low rate of completion, the Fund has often taken refuge in the claim that there has been a lack of ''political will'' on the part of governments (Bird, 1998). But if it is political will that is important, and if Fund conditionality does little to actively cultivate it, there may be little reason for potential foreign lenders to place much store in agreements with the IMF *per se*.

Third, since there are the apparently rather muted effects of IMF programs on the range of macroeconomic variables in which foreign investors may be interested, private capital markets may remain unexcited by programs, which may themselves be associated with a decline in the investment rate and the rate of economic growth. If domestic investors have decided to invest less, why should foreign investors decide to invest more?

Even if macroeconomic outcomes were strong and positive there remains a problem for the theory of conditionality-induced capital mobilization, since in general good outcomes would be associated with poor implementation. Where good outcomes were only found to be associated with good implementation, something positive would be said about conditionality, but this would only help foreign lenders in the period immediately following the negotiation of a Fund agreement if they could identify *ex ante* the good implementers. If implementation depends on ''political will,'' about which the negotiation of a program with the Fund says little, conditionality will surely do little to help catalyze foreign capital.

Moreover, countries tend to turn to the Fund when their economies are in severe difficulties and they have no alternative source of finance. On top of this, and as already established, there are strong elements of recidivism in IMF lending. Past programs with the Fund are a significant predictor of near-term future programs. The conclusion follows that negotiating a contemporary program with the Fund indicates a high probability that the economy will be in severe difficulties over at least the next three years. This will do little to foster confidence within capital markets. Indeed in this context programs transmit a negative signal about both the present and the future. [5]

Fourth, lending by the IMF may have a political or institutional component. There is evidence that estimating equations which con-

tain proxies for political and institutional factors possess superior explanatory power over those which include only economic variables, suggesting that such factors exert a significant effect (Bird & Rowlands, 2001c; Thacker, 1999). Political and institutional noise surrounding Fund lending interferes with the economic signal that is being transmitted to private capital markets and either makes the catalytic effect on private capital flows weaker or more complex.

Finally, there is the question of whether the conventional catalytic effect accurately reflects causality. The orthodox theory is that by negotiating an IMF program a country can enhance its creditworthiness and gain access to larger amounts of foreign capital than it would have been able to do in the absence of the program. The story starts with the IMF agreement. An alternative story is that it is the *prospect* of future IMF lending, should things go wrong, that *induces* private capital markets to lend excessively to countries. Excessive private capital inflows then create macroeconomic disequilibria that may reach a point where the Fund becomes actively involved. Fund lending is then interpreted as bailing out private creditors; there is a moral hazard problem. In this context, countries either have adequate access to private capital markets, in which case they do not turn to the IMF, or they do not have such access in which case they borrow from the Fund. Fund lending is a substitute for private capital and there will be a negative relationship between IMF agreements and private capital inflows. Moreover, to the extent that foreign aid is also a substitute for private capital, bilateral aid and IMF lending may be complements. Indeed aid flows and IMF programs may be simultaneously determined, with aid donors being directly or indirectly involved in the design of IMF programs. The relationship between IMF lending and other capital inflows may therefore be fundamentally different for different types of flows and for middle-income and low-income countries.

While there are theoretical ambiguities about the Fund's catalyzing role the empirical evidence is a little clearer although not completely without ambiguity and also subject to the counterfactual problem. The IMF has suggested that the resurgence of private capital flows to Latin America may be interpreted as evidence in support of effective catalysis. Thus Dhonte (1997) claims that

> first and foremost, there is the track record of Latin America, which has secured renewed access to financial markets. . .due in part to a distinct change in policies and in global approach in the countries of the region, which Fund programs have been instrumental in stimulating.

Other research that has set out to better understand this resurgence distinguishes between "pull" and "push" factors. [6] Pull factors include aspects of domestic economic policy and performance while push factors include changes in world interest rates and economic activity. Although the details of the results vary across studies, a consistent theme is the significance of push factors, which lie outside the control of the capital-importing developing countries and beyond the influence of IMF conditionality. It is therefore difficult to accept private capital flows to Latin America as evidence of catalysis.

Studies of IMF arrangements have discovered a generally weak relationship between IMF programs and private capital flows and one that is as likely to be negative as positive. [7] Faini, de Melo, Senhadji-Semlali, and Stanton (1991) and Killick (1995) provide further evidence of a negative relationship between multilateral lending and private capital flows. While Rodrik (1996) finds some empirical evidence of positive catalysis, the effect is weak and insignificant. Bird and Rowlands (2001b) examine qualitative, quantitative, and case study evidence and disaggregate the data across both IMF facilities and types of capital flow. A summary of their quantitative results covering 1983–95 is provided in Table 4. Without going into the details of this study it is relevant to note that the authors conclude that "the bottom line is that large-scale empirical evidence continues to remain inconsistent with the very commonly-held view of significant positive catalysis." They also claim that their qualitative and case study evidence is consistent with this conclusion. Taking all the available empirical evidence therefore it seems reasonable to conclude that the catalyzing role of IMF programs has not worked well.

Where does this leave us in terms of answering the question posed in the first part of this paper? Taking a narrow focus, which concentrates exclusively on the effects on the balance of payments, it appears reasonable to claim that IMF programs work. But, if the definition of "work" is broadened to include the effects of IMF programs on other macroeconomic outcomes and policy variables, as well as the extent to which IMF programs

Table 4. *Fixed-effects estimation of influences over capital flows*[a]

Variable	FDI	Portfolio	Private debt	Official source
GNP per capita	11.1**	5.999***	4.49	−381.2***
	(2.18)	(3.41)	(1.10)	(−6.64)
GNPpc^2	−0.00141***	−0.0052***	−0.000334	0.0356***
	(−2.80)	(−2.95)	(−0.88)	(5.97)
GDP rrowth	52.7	−3.57	34.2	−2799.9*
	(0.94)	(−0.38)	(0.97)	(−1.76)
Investment/GDP	453.9	5.77	184.7	1635.8
	(1.49)	(0.13)	(1.27)	(0.86)
Exports/GDP	−10.3	111.2***	−282.3**	79.6
	(−0.07)	(2.82)	(−2.20)	(0.05)
Real LIBOR	−688.8	−44.1	902.3	−20212***
	(−1.50)	(−0.36)	(1.99)	(−4.08)
Inflation	−0.172	−0.123	0.0336	2.07
	(−0.60)	(−1.41)	(1.45)	(0.15)
Exchange rate	6.83	4.77**	0.531	791.9
	(1.58)	(2.00)	(0.12)	(1.44)
Reserves/debt	−5.47	0.602	3.40	−273.5***
	(−0.68)	(0.71)	(0.39)	(−2.82)
Debt service ratio	−59.3	7.03	−67.6	269.0
	(−1.09)	(0.58)	(−0.75)	(0.23)
Debt problems	449.9	−853.5	−2322.5	79819*
	(0.13)	(−1.44)	(−1.22)	(1.84)
Restrictions	−4787.7***	−1330.1***	−1773.1	15628
	(−3.33)	(−2.74)	(−1.33)	(0.41)
SBAs	−501.8	−388.2	−4001.4***	−10549
	(−0.41)	(−0.84)	(−2.72)	(−0.74)
EFF	1813.2	−2938.3	−7584.4*	−13375
	(0.61)	(−1.05)	(−1.89)	(−0.71)
ESAFs	307.7	−793.1	−4193.3*	−759.6
	(0.99)	(−1.05)	(−1.72)	(−0.02)
SAFs	366.6	103.9	1147.7	8521.7
	(0.08)	(0.23)	(0.73)	(0.35)
Incompletion	1182.4	679.7	1338.5	−11652
	(0.94)	(0.88)	(1.58)	(−0.78)
Past programs	−1147.9	−1166.8	−2811.9***	−2896.0***
	(−1.10)	(−1.23)	(3.86)	(−2.65)
Growth+	–	25.4	–	2174.9
		(1.46)		(1.61)
LIBOR+	–	–	1367.5**	–
			(2.14)	
Inflation+	−2.01**	−0.896	–	–
	(−2.13)	−1.59		
Reserves/debt+	−47.03**	−3.73	–	537.2***
	(−2.16)	(−1.56)		(4.01)
Debt problems+	–	–	–	−133238**
				(−2.07)
Restrictions+	–	–	–	−86717**
				(−2.35)
EFFs	–	5066.8	–	–
		(1.54)		
Past programs+	2062.6	1747.7**	–	44177**
	(1.54)	(2.21)		(2.62)
R^2	0.514	0.214	0.180	0.822
Adjusted R^2	0.442	0.097	0.063	0.795

Source: Bird and Rowlands (2001c). Details about the data set and the methodology used are provided in the original source. For our purposes it is only the broad picture that is important.

[a] The *t*-statistics appear in parentheses. All dependent variables are lagged one year except the LIBOR rate and the presence of restrictions, which are not lagged. The + symbol refers to a variable's additional effect for middle-income countries. The coefficients have been normalized to represent the effects of a one unit change of the independent variable on the number of additional dollars of capital inflow per million dollars of GDP.

* Significant at the 5% level, one-tailed test.

** Significant at the 2.5% level, one-tailed test.

*** Significant at the 1% level, one-tailed test.

enable the Fund to comply with its Articles of Agreement and other objectives that it has set, the judgement becomes much less sanguine. The reality is that Fund programs seem to have a negative effect on investment and possibly economic growth, often do not enable countries to graduate from a reliance on IMF resources, more often than not remain uncompleted, and do not catalyze external finance from other sources. What is the appropriate policy response to this situation?

4. CAN IMF PROGRAMS BE MADE TO WORK BETTER?

There are a number of policy options; do nothing, abandon conditionality, replace conditionality with preconditions, reform current conditionality in other ways. This section briefly explores the extent to which the evaluation of conditionality undertaken in the previous section points in particular policy directions. The discussion seeks, however, to be merely indicative.

To do nothing would be to leave the deficiencies in conditionality that have already been identified. To abandon it altogether would create the moral hazard problem that, in part, justified its introduction in the first place. To replace it completely with preconditions would overcome the problem of noncompliance, since compliance would become a prerequisite for financial assistance, but it would mean that countries would be heavily constrained in their access to external financing at precisely the times that they most need it, and this could imply that suboptimal adjustment strategies would have to be pursued in a way that would be inconsistent with the Fund's Articles. While there is a role for preconditions there may also therefore be an argument for reforming conventional conditionality.

Since economic growth seems to offer a potential path for graduation from the Fund, a better understanding of what determines it in developing countries and CITs is needed in order to see how IMF programs could exert a positive, or at least a nonnegative, influence. A simple absorption approach to the balance of payments illustrates the choice that exists, in principle, between contracting aggregate demand and expanding aggregate supply. IMF conditionality has conventionally focused on contracting aggregate demand, even in the context of structural adjustment, and this is likely to have a negative short-term effect on investment and economic growth. Structural adjustment requires adequate short-term financing, and the message may be that supply-side initiatives emanating from the IMF have been inadequately financed.

Part of the problem with conditionality may be that governments only turn to the Fund when the economic situation is severe with this dictating the design of conditionality in a way that in turn discourages early referral. Reform to conditionality needs to try and break this vicious circle. A stronger growth orientation could help close the gap between the policy preferences of governments, which reflect their priorities in terms of economic objectives, and those of the Fund. This could then encourage the earlier referral that the Fund favors.

In the light of the above, and drawing on the evidence concerning the effects of IMF programs on policy instruments and outcomes, an argument can be made that conditionality should focus relatively more on exchange rate policy and less on the control of monetary aggregates. IMF programs have been shown to exert a significant and durable effect on the real exchange rate. Inflation has not generally accelerated as a consequence, and the balance of payments has tended to improve. Moreover exchange rate policy offers an instrument for bringing about required structural adjustment by strengthening the tradeables sector.

By modifying the design of IMF programs it may be possible to improve the rate of completion and reduce recidivism. But, more generally, greater attention needs to be paid to the implementation of programs. A better understanding is needed of the determinants of compliance and this may require further research into the political economy of policy reform. One approach would be to investigate the perceived benefits and costs of compliance and how these change during the lifetime of programs. Another related way may be to make greater use of the idea of "ownership" which suggests that governments and countries would be more committed to programs, and therefore more likely to implement them if they felt ownership of the programs. Ownership is, of course, an ill-defined concept and the harder question relates to what determines it. In addition, there is the underlying problem that to some unavoidable extent conditionality must impose a reduction in ownership as compared

with no conditionality. Given that constraint, there are a number of ways in which ownership might be fostered. These would involve allowing governments the maximum degree of discretion in designing economic policy and keeping performance criteria to the minimum envisaged as being crucial for the "success" of an agreed program in guaranteeing repayment. A useful distinction could be made between mandatory conditionality and nonmandatory recommendations. Letters of intent could, for example, remain reasonably wide-ranging, but a higher proportion of agreed policies could be deemed nonmandatory and therefore as not affecting a country's eligibility to draw on future instalments of an IMF credit. This would make it easier for countries to complete programs.

Yet more broadly, reform of conditionality needs to consider the incentives that confront countries in terms of implementation. Completion may be encouraged not only by inducing a stronger sense of ownership but also by increasing the penalty for noncompliance. Forfeiting later installments of a loan may fail to provide a strong disincentive if a country is then able quickly to negotiate another program.

If the route to catalysis is via conditionality, reforms that raise the rate of completion and reduce recidivism may be expected to strengthen the catalytic effect of Fund programs. Conditionality would then begin to transmit a stronger and more positive signal. In the absence of powerful catalysis, however, the Fund could itself seek to mobilize private capital in support of its programs by borrowing directly from private capital markets (Bird & Rowlands, 2001c). To the extent that there has been a binding external financing constraint, which has affected the design of IMF programs, additional lending by the Fund could allow the adjustment component of programs to be better designed with beneficial consequences for completion and recidivism.

5. CONCLUDING REMARKS

As part of a general discussion of the international financial architecture and the role of the IMF there is an on-going debate about IMF conditionality. Much of this debate is founded on an assessment of whether IMF programs work. If they do not, there may be little need to reform conditionality. If they do not then perhaps, as the Meltzer Commission suggests, it would be a good idea to abandon conditionality, at least in its current form.

This paper has demonstrated that there is no single and unique definition of "work." Traditionally the question has been approached by assessing the effects of IMF programs on macroeconomic policies and final outcomes. A mixed picture emerges, however, and fundamental issues still remain to be resolved. If some programs work better than others according to this criterion, why? To what extent does the success of a program depend on the degree of policy implementation, and does this itself depend on the amount of financing provided by the Fund?

A different approach is to identify other additional indicators of success and failure. This has been the approach adopted here with criteria being selected on the basis of the IMF's own institutional objectives. High rates of recidivism, low rates of completion, and an insignificant catalytic effect on other capital flows are presented as evidence that IMF programs and the related conditionality do not work in the way intended; or more accurately, often do not work.

Can they be made to work better? Abandoning conditionality altogether in circumstances where the Fund continues to make loans would encounter moral hazard problems. Substituting preconditions completely for conventional conditionality would preclude the Fund from offering assistance in circumstances where its own Articles suggest it should be lending. That leaves reforming conditionality in other ways.

Without recommending a specific set of reforms this paper suggests that reform needs to be aimed at rectifying the deficiencies identified. Reform should therefore focus on reducing recidivism, increasing the rate of completion and strengthening catalysis. This implies a broader discussion encompassing the design of adjustment and its intertemporal pattern, the size of external financing, and the political economy of policy reform. These are interrelated issues. A concern is that the on-going debate over conditionality may assume a narrower perspective concentrating on "mission creep" and the extent to which conditionality has become excessive. Although not without benefit, such a debate may fail to draw attention to all the issues that need to be considered in attempting to improve the performance of IMF programs in the future.

NOTES

1. The Reports are those of the International Financial Institution Advisory Commission (2000), the Council on Foreign Relations Task Force (1999), and the Overseas Development Council (2000). The idea of a conditionality Laffer curve is explored by Bird (2001) although the IMF claims that there is little evidence to support the idea (IMF, 2001).

2. There is an exercise in semantics in terms of whether the programs negotiated between a government and the IMF should be called IMF-supported programs or IMF programs. The Fund favors the former description on the basis that governments carry ultimate responsibility for programs. Others see governments as exercising little discretion in the circumstances that bring them to the Fund. Without getting involved in this debate the shorter description is used in this paper on grounds of efficiency.

3. Studies that have distinguished between short- and long-run effects confirm that there are significant differences (Conway, 1994; Killick, 1995).

4. Yet it may be unsafe to attribute improvements in the balance of payments to Fund programs *per se*. Countries usually only turn to the IMF when they have a balance-of-payments crisis. From this base some improvement may be expected with or without the Fund. The policy priorities of governments change in the midst of crisis. Strengthening the balance of payments becomes a higher priority and negotiating a program with the Fund is, in a sense, an indication of this reordering of priorities. In crisis conditions the balance of payments becomes a policy objective rather than simply a constraint on other objectives. The counterfactual, appropriately constructed, should allow for this. Indeed, without financial support from the Fund a country would by implication have to place even greater emphasis on adjustment. The absence of Fund support implies sharper adjustment, and *ceteris paribus*, a sharper reduction in the current account deficit. Perhaps it is the crisis that induces the improvement, with the Fund in fact allowing the policy change to be more gradual. While Fund programs are associated with reduced current account deficits, they may not therefore have the *effect* of reducing deficits when judged against the appropriate counterfactual.

5. There are three points that may be made about the relationship between IMF lending and other capital flows. First, there is every possibility that it will differ according to the nature of the other capital flows. From among private capital flows, bank lending, portfolio investment and foreign direct investment may be determined by different factors. Even where the factors are similar, the weights attached to them may differ. It may be reasonable to assume, for example, that foreign direct investment will be more influenced by medium-to-long term prospects for economic growth than will be short-term bank lending. A stronger distinction may be expected to exist between private flows and official flows. Aid donors may be more concerned about seeing a commitment to a range of policy reforms rather than the prospect of a commercial rate of return. Even the sign of the coefficient may be expected to be different on some determining variables if aid is directed toward relatively poor countries in severe economic difficulties. Slower economic growth and faster inflation may result in more aid, not less. Moreover, aid may serve the donor's political objectives, and the connection with Fund lending will then depend on the extent to which donors see the Fund as a conduit for exercising their political imperatives.

6. Bird (1999) provides a brief review of this research.

7. These studies are summarized in Bird (1995).

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