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The economic characteristics of IMF program countries *

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A logit analysis is utilized to identify the factors that characterized developing nations that entered IMF stabilization programs in the early 1980s. Program countries recorded higher rates of domestic credit growth, larger shares of government expenditure, more severe current account deficits, smaller reserve holdings and lower per-capita incomes.

1. Introduction

The International Monetary Fund (IMF) has played an important role in assisting developing countries deal with external disequilibria through its stabilization programs. Studies of IMF conditionality have scrutinized the record of countries enrolled in Fund programs, employing an array of macroeconomic indicators as criteria for judging whether the program countries have improved their economic performance. [1] However, there has been little empirical analysis of the factors that characterized the countries when they approached the Fund for assistance. [2]

An economic profile of the countries entering into IMF stabilization programs would be beneficial for an understanding of the circumstances which cause a country to enter an IMF program. The countries which turn to the Fund do so because their economic performance has deteriorated, and their governments seek outside assistance to improve their situation. There should be objective differences, therefore, between program and non-program countries which distinguish the former from the latter. The identification of the relevant macroeconomic indicators would aid in the design of appropriate policy measures and allow a more accurate evaluation of conditionality.

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[1] See, for example, Donovan (1982), Williamson (1983), Killick (1984), Edwards (1989) and Khan (1990).

[2] See, however, Bird and Orme (1981) and Cornelius (1987) for analyses of countries that dealt with the IMF, and Frey, Horn, Persson and Schneider (1985) for World Bank behavior.

2. The model

In a review of the methodology used in empirical studies of conditionality, Goldstein and Montiel (1986) suggested that countries enter into IMF programs when they have passed a threshold determined by economic criteria. This process can be examined through the use of a logit model, which is designed for the analysis of qualitative choice decisions. The general specification is written as:

$$P_i = 1/[1 + \exp(-X_i\beta)], \tag{1}$$

where P is the probability that a country will enter a Fund stabilization program, X_i is a vector of economic indicators, and β their coefficients.

In order to apply the model for empirical investigation, elements of X_i must be identified. To clarify the analysis, the indicators under consideration are arranged into four categories. This classification scheme enables us to differentiate among the general reasons which could induce a country to accept a Fund program and to test specific hypotheses.

The first class of indicators deals with macroeconomic policies. The IMF's emphasis upon credit ceilings and budgetary restraint indicates its concern that expansionary policies have contributed to a decline in a country's economic position. Two variables are utilized to assess the status of government policies. An increase in a central bank's holdings of domestic credit assets stimulates aggregate spending and would raise the probability that a country needs Fund assistance. The proportion of Gross Domestic Product (GDP) devoted to public expenditures reflects the government's claim on local resources. A larger allocation of output to the public sector may heighten reliance on the IMF if productivity in other sectors is affected.

The second category of variables deals with a country's economic performance. Nations will turn to the Fund because of adverse economic conditions, regardless of their source or cause. Indicators of both the foreign and domestic sectors are included. An improvement in the current account balance would lower the probability of adoption of an IMF plan, since a primary Fund purpose is to assist countries with balance of payments problems. An increase in the rate of inflation could accompany a deterioration in economic performance, raising the need for Fund assistance.

Countries with similar economic problems can differ substantially in their ability to cope with them. The third class of indicators examines a country's ability to finance or adjust to an external deficit. The availability of international reserves to cover the cost of imports is measured by the ratio of reserves to imports of goods and services. A higher reserve to import ratio allows a nation to respond to a deficit without outside assistance. The per-capita level of income was included to determine whether richer developing nations have been less reliant on the Fund, in part because of their ability to change levels of expenditure.

Finally, countries with similar financial needs may be treated very differently in the private capital markets. Two financial indicators were used to investigate whether some countries are more likely to turn to the Fund rather than private markets. [3] Commitments of loans from private creditors may signal how successful an economy has been in attracting additional capital, with countries with relatively higher commitments less likely to need the IMF. The demands on a country's resources already in place from past borrowing are measured by the total debt service ratio, the ratio of principal repayments and interest charges to exports of goods and services. An increasing debt service ratio may raise the chances of IMF program selection if private lenders are

[3] Surveys of financial credit worthiness, such as those conduced by *Institutional Investor* or *Euromoney*, do not include a number of developing countries, including some in our sample.

reluctant to extend additional funds, or if Fund financing is seen as preferable to further private borrowing.

The estimation form of the model is specified as:

$$Z_t = \beta_0 + \beta_1 DCG_{t-1} + \beta_2 GOV_{t-1} - \beta_3 CUR_{t-1} + \beta_4 INF_{t-1} - \beta_5 RES_{t-1} - \beta_6 INC_{t-1} - \beta_7 COM_{t-1} + \beta_8 TDS_{t-1} + e_t, \quad (2)$$

where Z_t takes the value of unity in a year when a country is enrolled in a Fund stabilization program, and zero otherwise; *DCG* is the percentage growth in the central bank's holdings of domestic assets; *GOV* is the ratio of government expenditures to GDP; *CUR* is the ratio of the current account balance to exports; *INF* is the annual growth rate of the Consumer Price Index; *RES* is the ratio of international reserves to imports; *INC* is the per-capita level of dollar GDP; *COM* is the ratio of commitments for loans from private sources signed during the year to imports; *TDS* is the ratio of total debt service to exports; and e_t is a disturbance term with zero mean. The indicator variables are all lagged by one period because of delays to policymakers in the availability of data, and to avoid simultaneity bias.

3. Empirical evidence

A sample of 45 countries was chosen and the IMF's policy programs during 1980–1984 chosen for the analysis, which yielded 225 annual observations. This period followed the second oil price shock, and witnessed an increased demand for IMF assistance to developing countries. Dummy variables for the first four years were included to account for changes across time.

Table 1 reports the countries included in the sample and the dates of their 72 stand-by agreements, which represents approximately two-thirds of all IMF stand-by agreements signed during this period. The stand-by agreement is the IMF's primary program for making its resources available to members, and links the provision of financial assistance to the implementation of a policy program. The existence of multiple agreements could be due to recurring shocks, slow response to policy measures, inadequate implementation of policies, or some combination of all these factors. In addition, several of the countries in the sample signed Extended Fund Facility agreements during this period, as noted in table 1. Since this program was also intended for countries with balance of payments difficulties, the dependent value in these cases was assigned a value of one.

The following data were obtained from the *International Financial Statistics* of the IMF: exchange rate per U.S. dollar; domestic claims of the central bank; government consumption; Gross Domestic Product; the Consumer Price Index; the current account balance; exports and imports of goods, services and income. International reserve holdings (which include foreign exchange, gold, Special Drawing Rights and Fund reserve positions) and data on external debt appear in the World Bank's *World Debt Tables*. Per-capita dollar Gross Domestic Product figures appear in its *World Development Report*. The IMF's *Annual Report* includes the signature dates of stand-by and Extended Facility agreements.

Table 2 reports the results of the maximum likelihood estimation of equation (2). In column (a), the full estimation of the model over all observations appears. The results reveal that a combination of factors contributed to acceptance of Fund programs. In addition, the dummy variables for 1980, 1981 and 1983 are positive and significant, reflecting a higher overall number of Fund agreements in those years.

Table 1
Countries and dates of IMF stand-by and extended fund facility agreements. [a]

Algeria –	Mauritania 1980, 1981
Argentina 1983, 1984	Mauritius 1980, 1981, 1983
Bolivia 1980	Mexico 1983(E)
Brazil 1983(E)	Morocco 1980(E), 1981(E), 1982, 1983
Cameroon –	Niger 1983, 1984
Central African Republic 1980, 1981, 1983, 1984	Panama 1980, 1982, 1983
Chile 1983	Paraguay –
Colombia –	Philippines 1980, 1983, 1984
Costa Rica 1980, 1981(E), 1982	Portugal 1983
Ecuador 1983	Senegal 1980(E), 1981, 1983, 1984
El Salvador 1980, 1982	Singapore –
Ghana 1983, 1984	Sri Lanka 1983
Greece –	Syria –
Guatemala 1981, 1983	Tanzania 1980
Honduras 1982	Thailand 1981, 1982
Indonesia –	Togo 1981, 1983, 1984
Kenya 1980, 1982, 1983	Tunisia –
Korea 1980, 1981, 1983	Uruguay 1980, 1981, 1983
Liberia 1980, 1981, 1982, 1983, 1984	Venezuela –
Madagascar 1980, 1981, 1982, 1984	Yugoslavia 1980, 1981, 1984
Malawi 1980, 1982, 1983(E)	Zaire 1981(E), 1983
Malaysia –	Zambia 1981(E), 1983, 1984
	Zimbabwe 1981, 1983

[a] (E) = Extended Fund Facility agreement.
Source: '*Annual Report,*' IMF (various years).

Domestic credit growth and the government's share of domestic output both have the expected positive coefficients and are significant at the 10% and 5% levels, respectively. Countries which entered Fund programs were engaged in relatively more expansionary policies than non-program countries. However, this finding does not demonstrate whether domestic policies are the primary causal agents of disequilibria (although they may extend them).

The current account balance ratio appears with the expected negative sign and is also significant, indicating that the Fund promoted external adjustment in those countries with particularly severe balance of payments problems. The inflation coefficient, however, while positive, is not significant. [4] Estimating the model without the policy variables to avoid possible simultaneity bias did not change this finding, as shown in column (b). Under the regime of fixed exchange rates which was generally maintained by these countries, domestic price changes were partially linked to global inflation, and may not have varied systematically between program and non-program countries.

The measurement of reserve adequacy has the expected negative coefficient and is significant at the 5% level. An inability to finance an external deficit through its own resources raised the probability that a country will need outside assistance. The coefficient on per-capita income was also negative and significant, with poorer countries more likely to receive Fund assistance. This distinction may reflect the difficulties these countries face in financing or adjusting to external disequilibria.

[4] The current rate of inflation was tested, with similar results. The change in the real exchange rate was also tested, and found to be not significant.

Table 2
Model estimates. [a]

Variable	a	b
Constant	−2.147 ***	−0.711
	(0.772)	(0.513)
DCG_{t-1}	0.011 *	–
	(0.006)	–
GOV_{t-1}	8.199 **	–
	(3.393)	–
CUR_{t-1}	−1.278 *	−1.286 *
	(0.741)	(0.715)
INF_{t-1}	0.002	−0.004
	(0.009)	(0.008)
RES_{t-1}	−1.785 **	−2.139 **
	(0.885)	(0.847)
INC_{t-1}	−0.0003 *	−0.0003 *
	(0.0002)	(0.0002)
COM_{t-1}	−2.306	−2.024
	(2.391)	(2.276)
TDS_{t-1}	−0.691	−0.021
	(1.975)	(1.888)
DUM80	1.232 **	1.203 **
	(0.546)	(0.533)
DUM81	0.876 *	0.903 *
	(0.519)	(0.509)
DUM82	−0.007	−0.068
	(0.537)	(0.526)
DUM83	1.506 ***	1.595 ***
	(0.508)	(0.499)
Log-likelihood statistic	52.66 ***	42.21 ***
Log-likelihood ratio	0.18	0.14

[a] Standard errors are reported in parentheses. Asterisks indicate the following significance levels: * 10%; ** 5%; *** 1%.

While the commitment of new funds from private creditors relative to imports had a negative impact on requests for Fund assistance, it was not significant. Other possible indicators of creditworthiness, such as total disbursed private-source debt or the proportion of debt consisting of variable interest rate loans, did not fare any better. The coefficient on the debt service ratio also has a negative sign and is not significant. A high level of debt service from past borrowing need not accompany a crisis or a request for Fund assistance. [5]

Two summary statistics are reported for each equation. The first, the log-likelihood statistic, has a chi-squared distribution, and tests the null hypothesis that the coefficients of all the independent

[5] Saini and Bates (1984), in their survey of studies of debt rescheduling, found that debt ratios were not useful in predicting the incidence of rescheduling.

Table 3
Mean values of economic characteristics.

Variable	Program countries	Non-program countries
Domestic credit growth	35.5%	28.4%
Government spending/GDP	0.160	0.135
Current account/Exports	−0.318	−0.225
Reserves/Imports	0.185	0.315
Per-capita GDP	$944	$1491

variables are equal to zero. This hypothesis can be rejected in all cases at the 1% level. The second statistic, the log-likelihood ratio, measures the amount of uncertainty in the data explained by the variables. Its value of 0.14 to 0.18 for the different estimates is not unusual for a cross-sectional analysis, and indicates that the model is not well suited for prediction purposes. Our results are similar in this aspect to those of Bird and Orme (1981), whose model of the determinants of the amount of Fund credit predicted positive drawings in a large number of cases where none had occurred. They suggested that economic models exclude institutional and social factors which affect a government's decision on acceptance of Fund assistance.

4. Conclusions

The empirical results reported above can be used to derive a profile of some of the characteristics of the countries which entered IMF stabilization programs in the early 1980s. The mean values of the five significant macroeconomic variables for program and nonprogram countries are reported in table 3. Countries which signed agreements with the IMF had higher rates of domestic credit expansion, larger government sectors, more severe current account deficits, smaller reserve adequacy, and lower income levels than those which did not. A combination of economic policies, performance, and resources, therefore, all contributed to acceptance of a Fund program.

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