Many Happy Returns?
Recidivism and the IMF

Graham Bird [a], Mumtaz Hussain [b], Joseph P. Joyce [c,*]

[a] *Surrey Centre for International Economic Studies, University of Surrey, Guildford, Surrey GU2 7XH, United Kingdom*

[b] *Mumtaz Hussain, Department of Economics, Northeastern University, Boston, MA 02115*

[c] *Joseph P. Joyce, Department of Economics, Wellesley College, Wellesley, MA 02481*

Abstract

IMF programs are designed to provide a temporary source of finance for countries with balance of payments disequilibria. Consequently, borrowing from the IMF should occur infrequently and be widely distributed among member countries. However, some countries are recurrent users of Fund resources. This paper investigates which variables account for multiple borrowings from the IMF. We use models of count data to examine the impact of the need for financing, domestic policies, external shocks, and structural and institutional factors on borrowings between 1980 and 1996. We find that recidivist borrowers have lower reserve holdings, larger current account deficits and capital outflows, lower but less volatile terms of trade, larger debt service and external debt ratios, lower investment rates and per-capita income, and weak governance.

---

* Corresponding author. Tel.: +1-781-283-2160; fax: +1-781-283-2177.
  E-mail address: jjoyce@wellesley.edu (J.P. Joyce)

Many Happy Returns?
Recidivism and the IMF

1. Introduction

The International Monetary Fund (IMF) was established at Bretton Woods in 1944 as an interim source of external finance for member countries with exceptional balance of payments needs. The first of the IMF's Articles of Agreements outlines the Fund's purposes, which include:

> (v) To give confidence to members by making the general resources of the Fund
>
> temporarily available to them under adequate safeguards, thus providing them
>
> with opportunity to correct maladjustments in their balance of payments without
>
> resorting to measures destructive of national or international prosperity.
>
> (vi) In accordance with the above, to shorten the duration and lessen the degree
>
> of disequilibrium in the international balances of payments of members.

The Fund, therefore, was designed to provide financial support while the necessary changes in economic policy were implemented. Over time, a balance of payments deficit would be eliminated, or at least become sustainable, and the IMF's assistance would no longer be needed. In these circumstances borrowing from the IMF would be a low frequency event, and the Fund's resources would revolve as envisaged in the Articles.

In reality, member countries can be divided into three groups: nonusers, infrequent users and frequent or multiple users. The non-users either avoid balance of payments deficits or finance them through private borrowing. The infrequent users also usually avert deficits or have access to private capital markets because of their strong creditworthiness. However, occasionally they face balance of payments crises and during these periods they are forced to turn to the IMF

1

because their perceived riskiness as perceived in the private markets increases. For these countries, the IMF is a lender of last resort, to be used only when other sources of external finance are unavailable. Once the crisis passes and adjustment is carried out, their access to the private international capital markets is restored, which makes any future balance of payments deficit sustainable.

In contrast to these two groups are those countries which are frequent or multiple users of IMF credit. These economies have recurring balance of payments problems but little access to the capital markets, and turn to the Fund on a regular basis. In such cases there are elements of "recidivism" in the use of Fund resources.

Recidivism in this context raises complex issues. Recidivism usually carries connotations of habitual relapse, as into crime. But is it the case that IMF recidivists are countries that persistently mismanage their resources? Or do other factors, such as external shocks or structural characteristics, distinguish these countries? What does recidivism imply about conditionality and program design?

While a number of studies have observed the phenomenon of multiple use of Fund credit, none has examined IMF recidivism in any detail. This paper sets out to fill this gap by utilizing models with count data to identify the characteristics of those countries that make repeated use of Fund resources. The next section presents an analytical framework of the factors that may affect the rate of recidivism. The evidence of recidivism is presented in Section 3, and the methodology utilized in the empirical analysis is explained in Section 4. The empirical results are presented in Section 5. Section 6 offers some conclusions and implications.

2. Analytical Framework

Countries borrow from the IMF and adopt Fund programs when they face a balance of payments crisis, and private financing is either unavailable or prohibitively expensive. There have been a number of empirical studies that have sought to identify the distinguishing characteristics of these economies.[1] Bird (1996), in a summary of this body of research, reported that these studies often found that countries which entered IMF programs had a record of past involvement with the Fund. The phenomenon of the multiple use of Fund resources has also been noted in a number of studies on the effectiveness of Fund programs.[2] However, the existing literature does not distinguish between infrequent users and recidivists, or address the question of why some countries continue to return to the Fund while others do not.

An indirect explanation of recidivism is that the circumstances that caused countries to borrow from the Fund in the first place remain largely intact while in the case of non-recidivists they have changed. This implies that recidivists will have recurring and relatively large balance of payments deficits. A country's options on how to deal with such deficits are constrained by the availability of foreign reserves. Countries with chronic deficits and low holdings of reserves will have a need for financing, and those with poor access to capital markets will make frequent use of Fund resources. Countries with good access to capital markets, on the other hand, will only turn to the Fund when this access is interrupted. Recidivism is most likely to exist in

---

[1] See Joyce (1992), Edwards and Santaella (1993), Conway (1994), Santaella (1996) and Knight and Santaella (1997).

[2] See Goreaux (1989), Killick, et al. (1992), Bird (1995) and Conway (2000). The *Report of the International Financial Institution Advisory Commission* (2000) criticized the Fund for excessive lending.

countries where the IMF substitutes for private capital on a long-term basis and there is no significant catalytic effect between the IMF and private capital markets.[3]

However, the continuing presence of external disequilibria leaves unanswered the question of why deficits persist in this group of countries. One possibility is that the prevalence of balance of payments deficits is the result of macroeconomic mismanagement or instability, and domestic policies that have resulted in excess aggregate demand. In the case of fiscal policies, this laxity would be manifested by relatively large government sectors and chronic fiscal deficits; in the case of monetary policies, high and variable monetary growth and inflation rates.

These are precisely the types of policies that IMF programs are designed to correct.[4] If Fund programs induce a lasting improvement in policies and the balance of payments, then they should be associated with a lower probability of future referral. Conversely, countries that fail to implement a program may experience no strengthening in the balance of payments and will be forced to negotiate another program with the IMF. In these circumstances, the recidivists will also be those countries with a poor record of compliance with Fund programs.

Why would some countries choose not to complete a program with the Fund, especially when non-compliance is likely to result in having to negotiate another program? Some countries may face adverse external conditions that are outside their control. These could include declines

---

[3] The Fund has claimed that its programs can have a catalyzing effect on private capital flows to countries in the programs (Schadler et al. (1995)). However, Bird and Rowlands (1997) find little evidence of such an effect.

[4] See IMF (1987) and Fischer (1997) for IMF models of the balance of payments consistent with this analysis.

in their terms of trade or rising foreign interest rates and debt service that have a negative impact on the current account. These factors could account for multiple use of Fund resources as well as a record of non-compliance with Fund programs.

In addition, some countries may find that the cost of complying with a program's conditions exceeds the benefits.[5] These countries are likely to provide weak support for economic reform. Such countries may also exhibit signs of political instability, endemic corruption and a lack of civil authority.

Some of these ideas may be presented in a slightly different way. A common theme running through the literature on external debt is the distinction between problems of illiquidity and insolvency. This distinction is also useful in distinguishing between frequent and infrequent users of Fund resources. By their very nature liquidity problems tend to be short-term and transient whereas solvency problems are longer-term and intransient. Countries borrowing from the IMF will all tend to be illiquid, but they may not be suffering from permanent problems of insolvency. For non-recidivists, the liquidity provided by the IMF may be sufficient to overcome the crisis, particularly when there is a positive catalytic effect. For recidivists, on the other hand, liquidity is only a part of the solution. For them, the underlying solvency problem makes it more difficult to rectify their balance of payments deficits and raises the probability of their future use of IMF resources.

The rate of recidivism, therefore, may be associated with the need for financing, indicators of macroeconomic policies, external factors, and structural and institutional factors. The characteristics associated with high rates of recidivism tend to describe a problem of insolvency rather than one of illiquidity.

---

[5] For a discussion of the political economy of policy reform, see Bird (1998).

3. Data

For our empirical analysis we collected data on 90 developing countries over the years 1980-96. The sources of the data are reported in the Appendix.

Our sample included a wide range of countries, diversified by income, geography and other criteria. We excluded from the sample small countries with populations below one million and several countries with missing data. We did not include the transition economies that emerged in the 1990s, since they were only members of the Fund for a restricted portion of the entire sample period and their inclusion would bias the recidivism measurements. These countries were not included in the *International Country Risk Guide (ICRG)*, which provides institutional data for a broad range of developing economies, and other data were also missing. Our choice of dates for the sample period was guided by our use of data from the *ICRG*, which begins its coverage in the 1980s.

We consulted the *Annual Reports* of the IMF for program commitments signed by these countries during this period. We initially aggregated all regular credit programs, i.e., the Stand-By Arrangements (SBA) and the Extended Fund Facility (EFF) programs, as well as the concessional facilities for low-income countries, i.e., the Structural Adjustment Facility (SAF) and Enhanced Structural Adjustment Facility (ESAF). We also present results for just the SBAs and EFFs taken together. We also measured recidivism by the number of years spent by a country in IMF programs during this period.[6]

---

[6] A program year occurred when a country had an IMF program in place for at least six months of a calendar year.

Table 1 presents data on the number of IMF programs and the years spent in programs for the countries in our sample. Table 2 presents the frequency distributions for program commitments, which ranges from zero for 16 countries in our sample to 11, and the numbers of years spent in all IMF programs, which vary from zero to 16 years. As measured by the first criterion, the most recidivist nations were Senegal, which signed commitments for 11 programs; Madagascar (10); and Costa Rica, Jamaica, Kenya, Mauritania, Morocco and Togo (9 each). The countries that spent the largest numbers of years in Fund programs are Jamaica (16 years); Malawi, Togo and Uganda (15); and Cote d'Ivoire and the Philippines (14 each).

Table 3 presents a summary of some of the differences between the infrequent users, defined here as those countries in our sample which accounted for less than five programs, and the frequent users, i.e., those with five or more programs.[7] The group of frequent users generally had larger current account deficits and lower reserve holdings, consistent with their need for external finance. There is no evidence of a difference in the monetary growth rates. Debt service was higher in the frequent users group, while capital outflows are larger. There are a number of differences in the institutional characteristics of the two groups, as well as the number of changes in government. Finally, the frequent users appear to have a lower per capita GDP and human development ratings.

4. Methodology

The linear regression model is inappropriate for count data because it is not restricted to predict only the non-negative occurrence of events. The Poisson regression model is widely used

---

[7] The mean number of programs among the 74 countries in our sample which entered IMF programs was five.

for the analysis of count data. In the Poisson model, a response variable y_i denotes the ith observation of a non-negative discrete variable and x_i denotes the corresponding row of the matrix of k regressors, including a constant. The Poisson regression model specifies that y_i given x_i is Poisson distributed with the density function:

$$\Pr(Y = y_i) = f(y_i | \lambda_i) = \frac{e^{-\lambda_i} \lambda^{y_i}}{y_i!} \tag{1}$$

and mean parameter:

$$\lambda_i = \exp(x_i' \beta) = e^{\beta_1 + \beta_2 x_2 + \dots + \beta_k x_k} \tag{2}$$

where $\Pr(Y = y_i)$ is the probability of y occurring for sample observation i, λ is the Poisson distribution parameter, x' the (1 x k) vector of explanatory variables and β a (k x 1) parameter vector. The parameters are estimated using a maximum likelihood estimator (MLE).

Under the Poisson model, the conditional mean and variance of the dependent variable are constrained to be equal (equidispersion):

$$E(y_i | x_i) = V(y_i | x_i) = \lambda_i \tag{3}$$

The assumption of equidispersion is restrictive and often rejected in actual data. If the conditional mean is not equal to the variance, then the estimates in the Poisson regression model are consistent but inefficient. Usually data are overdispersed, which means that the conditional variance exceeds the conditional mean of y.

The negative binomial model (NB) relaxes the constraint of equidispersion of data by adding a gamma-distributed error term into the Poisson model. The negative binomial model's parameter λ can be expressed as an exponential function of the regressors and error term:

$$\lambda_i = \exp(x_i' \beta) + \exp(\varepsilon) = e^{\beta_1 + \beta_2 x_2 + \dots + \beta_k x_k + \varepsilon} \tag{4}$$

The error term allows for unexplained randomness in λ. It could reflect a specification error because of unobserved heterogeneity, omitted variables, or intrinsic randomness. If we assume a gamma distribution for the error term ε, then a closed form negative binomial model can be specified. The conditional mean and variance for the negative binomial model are calculated as:

$$E(y_i \mid x_i) = \lambda_i \tag{5}$$

$$V(y_i \mid x_i) = \lambda_i + \alpha\,\lambda_i^p \tag{6}$$

The parameter α represents the overdispersion parameter. The constant p determines the form of overdispersion and usually takes values of one or two. Accordingly, the NB model is labeled as NB1 or NB2. The variance functions for NB1 and NB2 take the following form:

$$\text{For NB1:} \qquad V(y_i \mid x_i) = \lambda_i + \alpha\,\lambda_i = (1 + \alpha)\,\lambda_i = \phi\,\lambda_i \tag{7}$$

$$\text{For NB2:} \qquad V(y_i \mid x_i) = \lambda_i + \alpha\,\lambda_i^2 \tag{8}$$

Since both models are equal to the Poisson model if the overdispersion parameter, α, is zero, the variance function is a natural starting point for specification testing. To assess the adequacy of the negative binomial model over the Poisson model, we test the hypothesis that $\alpha = 0$ against the hypothesis $\alpha \neq 0$.

Cameron and Trivedi (1998) suggest a test for overdispersion based on an auxiliary regression of the Poisson residual. The null hypothesis of equidispersion is tested against the alternative of overdispersion of the dependent variable. After estimating λ from the Poisson model, one can use an OLS regression to regress z_i on λ_i,

$$\text{For NB1:} \qquad z_i = \alpha + \mu_i \tag{9}$$

$$\text{For NB2:} \qquad z_i = \alpha\hat{\lambda} + \mu_i \tag{10}$$

where z_i is

$$z_i = \frac{[V(y_i|x_i) - y_i]}{E(y_i|x_i)} = \frac{[(y_i - \hat{\lambda}_i)^2 - y_i]}{\hat{\lambda}_i} \tag{11}$$

The test statistic for α has an asymptotically normal distribution under the null hypothesis of no overdispersion against the alternative of overdispersion. The significance of α determines that the Poisson model is not appropriate for the data. Alternatively, we can apply a likelihood ratio (LR) test to check if our data fit to the Poisson model. Since Poisson is a special case of the negative binomial model with α = 0, we can test the null hypothesis of a zero alpha using a LR test:

$$-2(\text{LLF}_{\text{Poisson}} - \text{LLF}_{\text{NB}}) \sim \chi^2_{(1-2\theta)} \tag{12}$$

A significant chi-square statistic test suggests that the Poisson model is inappropriate for the data under study.

Cameron and Windmeijer (1996, 1997) suggested pseudo R^2 measures of goodness-of-fit for the Poisson as well as negative binomial models. Similar R^2 measures can be calculated for negative binomial models.

5. Empirical Results

We estimated several models for the two dependent variables, the number of IMF programs and the number of years spent in IMF programs, and the results are reported in Tables 4 and 5. We estimated both Poisson and negative binomial models, and then examined the results of the two tests for the existence of overdispersion, the Cameron and Trivedi (1998) test from the regression of the Poisson residual and the likelihood ratio test. In a number of cases the results indicated that the hypothesis of overdispersion could not be rejected at the 5% level of

significance, and therefore we report the results from the negative binomial models.[8] The results are generally robust with respect both to the choice of indicator of recidivism, i.e., the number of programs vs. the number of years, as well as estimation method.

We initially specified models which examined the impact of external financing needs and macroeconomic policies on the incidence of borrowing. We subsequently dropped insignificant variables and added other variables. The indicators of the need for financing were RESIM, the average number of months of imports that could be financed by foreign reserves, and CAB5, the total number of years between 1980-96 when the current account deficit was larger than 5% of GDP. These variables have been used as informal criteria to assess a country's vulnerability to external sector crises and need for external assistance.[9]

The macroeconomic policy variables included FISBUD, the average annual budget balance as a percentage of GDP; GOVC, average government consumption as a proportion of GDP; M2GR, the average annual growth rate of broad money; and INF, the average inflation rate as measured by the increase in the Consumer Price Index. We utilized period averages for these variables and most of those considered below rather than count measurements since there is little consensus on their sustainable values, which depend on a country's circumstances. To

---

[8] The results of the Poisson estimations of the models are available from the authors.

[9] Barro and Lee (2001) used a similar foreign reserves variable as a determinant of IMF program participation. Summers first suggested the use of the current account 5% threshold as an indicator of excessive current account deficits (Financial Times 1995). Milesi-Ferreti and Razin (1996) and Edwards (2001) have referred to this benchmark, and Freund (2000) undertook an analysis of current account adjustment that showed that current account reversals typically occur when the deficit exceeds 5% of GDP.

avoid multicollinearity among the policy regressors, we estimated different specifications, first with FISBUD and M2GR (eqs. 4.1 and 5.1), and then with GOVC and INF (eqs. 4.2 and 5.2).[10]

The coefficient on the reserves variable in the first two equations (eqs. 4.1 and 5.1) is significant with a negative sign. The countries that borrow have relatively fewer reserves, forcing them to turn to the IMF for assistance when they have balance of payments disequilibria. The current account deficit was significant at the 1% level with the expected positive sign in equations (4.2) and (5.2). Countries with more frequent large deficits are more likely to approach the IMF for assistance. When we respecified the current account variable to measure the number of deficits greater than 7% of GDP we found similar results.

The fiscal budget, on the other hand, is not significant in either specification. The growth rate of M2 is also not significant, nor is the inflation rate. Using different measurements of money or prices does not change these results, nor does the use of the variation in monetary or price growth as explanatory variables. Nations that borrow frequently do not exhibit a pattern of high or variable monetary growth or inflation.

The government consumption variable is highly significant. However, it has a negative coefficient; a larger government sector reduces the probability of borrowing. This result contradicts the characterization of borrowers as profligate spenders, and there are several factors that can account for this result. First, Mosley (2000) showed that better growth performance is

---

[10] We also examined the relationship between recidivism and program completion. There is a high correlation between the total number of programs and the number of programs where a substantial amount of the funds was not disbursed, suggesting low compliance. We did not include the latter variable in the empirical analysis below because it would be affected by the same variables that determined recidivism.

linked to higher government shares of income in countries in sub-Sahara Africa, which account

for many of the frequent borrowers (although this relationship did not hold for other developing

economies). Second, our results may be consistent with Rodrik's (1999) finding of a positive

correlation between growth rates and government expenditures on social programs. In addition,

Rodrik (1998) also found that the size of the government sector is positively correlated with the

trade openness of an economy and also the variation in its terms of trade. He suggested that

governments may use their expenditures to stabilize an economy in the face of external shocks.

We test below whether borrowing is also related to these factors.

We then added several indicators of external sector developments to our models to

examine whether these factors also affected borrowing from the IMF, while retaining the

significant financing and macroeconomic policy variables. In equations (4.3) and (5.3) the

external variables include OPEN, the average trade to GDP ratio; TOT, the average terms of

trade; TDSEX, average debt service scaled by exports; and RESIM. In equations (4.4) and (5.4),

we utilize TOTSD, the standard deviation in the terms of trade as a measurement of volatility;

DBTGDP, average external debt scaled by GDP; and FEXR, the number of years over which a

country maintained a fixed exchange rate regime. We also used CAPFL, average net capital

flows scaled by GDP as an indicator of the need for financing, and GOVC in the latter equation.

The pseudo R^2s of both equations, while low, are higher than those of the two preceding

equations, indicating that external factors also affect the incidence of borrowing.

The openness variable is not significant in equation (4.3) and significant with a negative

sign in equation (5.3) only at the 10% level. The coefficient of the terms of trade, however, is

significant and negative in both equations at the 1% level. Trade by itself, therefore, does not

make a country more dependent on the IMF (and may have the opposite effect), but lower terms

of trade raises the probability that a country will have balance of payments crises and consequently will use IMF resources.

The standard deviation in the terms of trade has a highly significant negative coefficient. An increase in the variation in the terms of trade is associated with less borrowing. Among the countries in our sample with the smallest deviations in their terms of trade were such frequent borrowers as the Central African Republic and Senegal. Moreover, the terms of trade were most volatile for oil exporters such as Nigeria, which borrowed infrequently. This result is also consistent with Rodrik's (1998) linkage of the size of the government sector and the variation in the terms of trade.

The debt service variable in equations (4.3) and (5.3) is highly significant and positive, while the external debt variable in equations (4.4) and (5.4) is also significant.[11] A higher debt service and a larger stock of debt are both associated with the increased use of IMF resources. Many of the countries that appear on the list of heavily indebted poor countries (HIPC) are frequent users of Fund resources. The capital flow variable in equations (4.4) and (5.4) is also significant, demonstrating that larger capital outflows (or smaller inflows) are associated with borrowing from the IMF. Countries which receive less capital turn to the IMF to finance their external sector deficits.

The indicator of the fixed exchange rate regime, however, is not significant, nor were other exchange rate variables, such as measurements of change in the real exchange rate that were included in alternative specifications of the model. This result is contrary to the view that

---

[11] We also used the ratio of external debt to exports, but the results with this variable were not as robust as those with the debt/GDP ratio.

countries with fixed exchange rate regimes are more prone to balance of payment crises, and thus are more likely to request financial assistance from the IMF.

In the remaining equations, (4.5), (5.5), (4.6) and (5.6), structural and governance measures are added to determine whether they also affected borrowing. These included GDI, the average ratio of investment to GDP; YCAP, the logarithm of average GDP per capita; ICRG3, an indicator of governance based on the *ICRG*'s ratings of corruption, bureaucratic autonomy and civil order; and MIL, the number of years of military rule over the sample period. The governance variable is measured as the number of times a country's rankings fell below the annual average for all countries in the sample and it indicates whether a country's institutions were weaker relative to others. The respecification of the equations to include these variables again raises the pseudo R^2s, indicating that these factors also have a role in the decision to borrow.

The domestic investment variable is negative and significant at the 1% level when the number of years is the dependent variable and at the 10% level in the case of the number of programs. Income per capita is highly significant and negative regardless of the choice of measurement of borrowing. Poorer countries, which generally invest less, are more likely to borrow from the Fund. This can reflect both a continuing need for external assistance as well as a lack of access to private capital markets.

In addition, the coefficient of the measurement of governance is positive and significant when the number of years is the dependent variable, indicating that countries with poor governance are more likely to continue with IMF programs. A country with weak institutions may be incapable of implementing the policies needed to restore external equilibrium and achieve growth, and consequently may remain dependent for a prolonged period on multilateral

credit, including assistance from IMF. The coefficient with the military rule variable is negative but insignificant, indicating that the IMF neither favored nor sanctioned military regimes.

In our models in Tables 4 and 5, we initially examined whether policy imbalances (e.g., large fiscal deficits or high monetary growth) led to external disequilibria which required IMF programs. Therefore, we used contemporary policy variables in our tests of the determinants of program use. However, it is possible that the values of the policy variables (FISBUD, GOVC, M2GR, INF) were affected by the IMF programs, as these programs frequently impose performance criteria on these policies. This potential reverse causality would affect our results. We think this unlikely, because many of these countries failed to fulfill the conditions of IMF programs. However, in order to minimize potential reverse causality, we respecified these four variables by measuring their values over the period of 1975-85, and then re-estimated Eqs. (4.1) and (5.1), (4.2) and (5.2), (4.4) and (5.4), and (4.6) and (5.6), which included them. While there is some overlap with the 1980-1996 period over which we measured IMF program participation, this reformulation of these variables should to a large extent be independent of any effects from the IMF programs, and can serve as a proxy for the initial period policy stance.

We report these results in Tables 6 and 7. The results are consistent with those reported in Tables 4 and 5. The determinants of borrowing which were significant before, such as RESIM, CAB5, CAPFL, TOTSD, DBTGDP and YCAP, are significant again (in some cases at the 10% level) when we include lagged policy variables. The budget deficit (FISBUD) is significant in one initial specification of the model with a negative sign, but is not significant when other variables are added to the model. The results for the remaining policy variables, including government consumption (GOVC), are in line with those reported in Tables 4 and 5. Our results, therefore, are robust with respect to alternative specifications of the policy variables.

16

In Table 8 we present the results of negative binomial regressions where the dependent variable is the number of Stand-By Arrangements and Extended Fund Facility programs.[12] The results for these programs are similar but not identical to those presented above. The reserves and capital flows variables are highly significant, but the current account deficits variable is not. The results for the policy variables are similar to those reported above when the number of all programs is the dependent variable. Neither the fiscal budget nor monetary growth is significant, while government consumption is significant with a negative sign. The coefficients associated with the standard deviation of the terms of trade and the debt service ratio are all significant and have similar coefficients as in the previous results, while the terms of trade is significant at the 10% level in one equation. The external debt variable, however, is not significant. The per capita income variable is also not significant. The results indicate that the middle-income countries are more likely to use these facilities (SBA and EFF), while the poorer, indebted countries utilize the concessionary facilities. The governance variables are also not significant.

Our results, therefore, indicate that greater borrowing from the IMF takes place in relatively poor nations with large current account deficits that cannot be financed through reserve holdings or capital flows. These countries do not manifest excessive monetary or price growth or instability. The borrowers have higher debt-service and external debt ratios, and lower (but less volatile) terms of trade than other developing countries. There is also evidence that they have less investment spending and weak public institutions.

---

[12] The mean number of these programs for the countries in our sample was 3.28 with a standard deviation of 2.55. Three countries accounted for nine of these programs each, one country for eight, and nine countries had seven SBAs or EFFs.

6. Conclusions

The empirical results in this paper help to define the characteristics of countries that use IMF resources on a persistent basis. Countries that borrow tend to have recurring large current account deficits and lower reserve holdings, and consequently possess a need for external financing. The borrowers have larger capital outflows, which heighten their dependence on official external credit.

This study finds strong evidence that external factors play a role in the decision to borrow. An increase in borrowing from the Fund is linked to weak but less volatile terms of trade and high debt-service and external debt ratios. The choice of exchange rate regime does not by itself raise the frequency of borrowing. Since some of these factors are outside the control of the borrowing countries, their ability to respond to external shocks is limited.

There is also some indication that structural and institutional factors influence the incidence of borrowing. Borrowing from the IMF is inversely related to the level of income when the concessional facilities are included in the measurement of recidivism. Domestic investment spending is lower in the borrowing countries, consistent with the result on income per-capita. In one specification we found evidence of weak governance, which may affect a country's ability to comply with Fund programs.

What are the implications of these results? It is consistent with the IMF's purpose to provide financial assistance to countries that face fundamental balance of payments problems and have few, if any, alternative sources of external finance. Moreover, the fact that borrowers appear to exhibit signs of structural weakness may be seen as supporting the Fund's increasing efforts to address structural adjustment in program countries.

However, the evidence also suggests that these problems are not easily overcome. Reducing the incidence of borrowing depends on enabling countries to avoid the conditions we have reported that lead to recurring deficits, and a crucial policy issue is how this goal can best be achieved. Some have suggested that the IMF should emphasize economic growth and poverty reduction with redesigned conditionality. Others believe that the Fund has been attempting to address issues with which it is not equipped to deal, and that the Fund should withdraw from much of its lending to poor countries. These issues constitute an important component of the contemporary debate about the future of the Fund and the goals of its programs.

Acknowledgements

Appendix
Variable Definitions and Data Sources

Variable	Definitions and Data Sources

Dependent Variables

PROGS — Total number of IMF programs (Stand-by Arrangements (SBA), Extended Fund Facility (EFF), Structural Adjustment Facility (SAF), and Enhanced Structural Adjustment Facility (ESAF)) signed by a country between January 1980 and December 1996. IMF *Annual Reports*.

YRS — Total number of years (measured as 6 months or more) in IMF programs between January 1980 and December 1996. IMF *Annual Reports*.

SBAEFF — Total number of the SBA and EFF programs signed by a country between January 1980 and December 1996. IMF *Annual Reports*.

Financing Variables

RESIM — Average annual ratio of monthly imports to international reserves (excluding gold). World Bank's *World Development Indicators 1999* (*WDI*).

CAB5 — Total number of years between 1980-96 with current account deficit larger than 5% of GDP. *WDI*.

CAPFL — Average capital flows as percentage of GDP, 1980-96, net transfer definition including private and public flows. World Bank's *Global Development Finance 1999* (*GDI*) and *World Development Indicators*

Policy Variables

FISBUD — Average annual ratio of overall budget balance to GDP, 1980-96. *WDI*.

GOVC — Average general government consumption as percentage of GDP, 1980-96. *WDI*.

M2GR — Average annual growth rate of broad money (M2), 1980-96. IMF's *International Financial Statistics* (*IFS*).

INF — Average annual growth rate of Consumer Price Index, 1980-1996. *IFS*.

External Variables

OPEN — Average ratio of Exports and Imports to GDP, 1980-96. *IFS*

DBTGDP — Average external debt as percentage of GNP, 1980-96. World Bank's *Global Development Finance 1999* (*GDF*).

TOT — Average level of terms-of-trade (TOT), 1980-94. Data from the World Bank.

TOTSD — Standard deviation of TOT index between 1980-94

TDESX — Average ratio of the external debt servicing to exports of the country. *GDF*.

FEXR — Number of years with fixed exchange rate regime. IMF *Annual Report on Exchange Arrangements and Exchange Restrictions*, various issues

Structural Variables

GDI — Average ratio of gross domestic investment to GDP over 1980-96 period. *WDI*.

YCAP — Logarithm of average GDP (PPP dollars) per capita over 1980-96. Penn *World Tables 5.6*.

Institutional Variables

ICRG3 — Total number of years between 1982-95 when a country's rankings on corruption, bureaucracy and law and order are lower than sample average. *International Country Risk Guide* (*ICRG*).

MIL — Total number of years between 1982-95 when country was under military rule. Banks' *Cross-National Time-Series Data Archive*. Center for Social Analysis, State University of New York at Binghamton. Binghamton, New York.

REFERENCES

Barro, R. J., Lee, J.-W., 2001. "IMF Programs: Who is Chosen and What are the Effects?" Paper presented at 2nd Annual IMF Research Conference.

Bird, G., 1995. IMF Lending to Developing Countries. Routledge, London.

Bird, G., 1996. Borrowing from the IMF: The Policy Implications of Recent Empirical Research. World Development 24 (11), 1753-1760.

Bird, G., 1998. The Effectiveness of Conditionality and the Political Economy of Policy Reform. Policy Reform 1 (1), 89-113.

Bird, G., Rowlands, D., 1997. The Catalytic Effect of Lending by the International Financial Institutions. World Economy 20 (7), 967-991.

Cameron, A. C., Trivedi, P.K., 1998. Regression Analysis of Count Data. Cambridge University, Cambridge, UK.

Cameron, A. C., Windmeijer, F. A. G., 1996. R-Squared Measures for Count Data Regression Models with Applications to Health-Care Utilization. Journal of Business and Economic Statistics 14 (2), 209-20.

Cameron, A. C., Windmeijer, F. A. G., 1997. An R-Squared Measure of Goodness of Fit for Some Common Nonlinear Regression Models. Journal of Econometrics 77 (2), 329-42.

Conway, P., 1994. IMF Lending Programs: Participation and Impact. Journal of Development Economics 45 (2), 365-391.

Conway, P., 2000. IMF Programs and Economic Crisis: An Empirical Study of Transition. Mimeo.

Edwards, S., 2001. Does the Current Account Matter? In: Edwards, S., Frankel, J. (Eds.), Preventing Currency Crises in Emerging Markets. University of Chicago, Chicago (forthcoming).

Edwards, S., Santaella, J. A., 1993. Devaluation Controversies in the Developing Countries: Lessons from the Bretton Woods Era. In: Bordo, M.D., Eichengreen, B. (Eds.), A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform. University of Chicago, Chicago, pp. 405-455.

Financial Times. 1995. Tequila Hangover Brings Gloom to IADB meeting. April 4.

Fischer, S., 1997. Applied Economics in Action: IMF Programs. American Economic Review 87 (2), 23-27.

Freund, C. L., 2000. Current Account Adjustment in Industrialized Countries. International Finance Discussion Paper #692. Federal Reserve Board, Washington, DC.

Goreaux, L. M., 1989. The Fund and the Low-Income Countries. In: Gwin, C., Feinberg, R.E. (Eds.), The International Monetary Fund in a Multipolar World: Pulling Together. Overseas Development Council, Washington, DC, pp. 141-164.

International Financial Institution Advisory Commission, 2000. Report of the International Financial Institution Advisory Commission. U.S. Government Printing Office, Washington, DC.

International Monetary Fund, 1987. Theoretical Aspects of the Design of Fund-Supported Adjustment Programs. IMF Occasional Paper No. 55. IMF, Washington, DC.

Joyce, J. P., 1992. The Economic Characteristics of IMF Program Countries. Economics Letters 38 (2), 237-242.

Killick, T., Malik, M., Manuel, M., 1992. What Can We Know About the Effects of IMF Programmes? World Economy 15 (5), 575-597.

Knight, M., Santaella, J. A., 1997. Economic Determinants of IMF Financial Arrangements. Journal of Development Economics 54 (2), 405-436.

Milesi-Ferreti, G., Razin, A., 1996. Persistent Current Account Deficits: A Warning Signal? International Journal of Finance and Economics 1 (3), 161-181.

Mosley, P., 2000. Globalisation, Economic Policy and Convergence. World Economy 23 (5), 613-634.

Rodrik, D., 1998. Why Do More Open Economies Have Bigger Governments? Journal of Political Economy 106 (5), 997-1032.

Rodrik, D., 1999. The New Global Economy and Developing Countries: Making Openness Work. Overseas Development Council, Washington, DC.

Santaella, J. A., 1996. Stylized Facts Before IMF-Supported Macroeconomic Adjustment. IMF Staff Papers 43 (3), 502-544.

Schadler, S., Bennett, A., Carkovic, M., Dicks-Mireaux, L., Mecagni, M., Morsink, J. H. J., Savastano, M. A., 1995. IMF Conditionality: Experience Under Stand-By and Extended Arrangements, Part I: Key Issues and Findings. IMF Occasional Paper No. 128. IMF, Washington, DC.

Table 1

**Countries with Numbers and Years of 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
Cote 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
Haiti	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

Table 2

Numbers and Years in IMF Programs by Frequency

Numbers of IMF Programs	Frequency in Number	Frequency in Percentage	Years in IMF Programs	Frequency in Number	Frequency in Percentage
0	16	17.8	0	16	17.8
1	1	1.1	1	1	1.1
2	6	6.7	2	1	1.1
3	17	18.9	3	3	3.3
4	12	13.3	4	4	4.4
5	7	7.8	5	7	7.8
6	8	8.9	6	9	10.0
7	9	10.0	7	7	7.8
8	6	6.7	8	5	5.6
9	6	6.7	9	8	8.9
10	1	1.1	10	10	11.1
11	1	1.1	11	8	8.9
			12	1	1.1
			13	4	4.4
			14	2	2.2
			15	3	3.3
			16	1	1.1
Mean: 4.23	Standard Deviation: 2.91		Mean: 6.88	Standard Deviation: 4.45	

Table 3

Mean of Variables Across Infrequent Users and Frequent User Countries

Variable	Group 1		Group 2	
	Obs	Mean	Obs	Mean
Total number of IMF programs signed between January 1980 and December 1996	52	2.15	38	7.08
Total years (measured as 6 months or more) in IMF programs between 1980 and 1996	52	4.19	38	10.55
IMF programs' cancellation rate: ratio of number of canceled programs to total programs	52	0.07	38	0.20
Number of IMF programs with funds withdrawn less than 80% of agreed amount	52	1.10	38	3.05
Average current account balance as % of GDP	51	-3.79	38	-5.44
Average number of months of imports financed by international reserves excluding gold	52	3.74	38	2.25
Years with international reserves (excluding gold) below one month worth of imports	52	1.96	38	4.66
Average capital flows as % of GDP, net transfer definition with private and public flows.	45	-5.91	38	-45.41
Average annual overall budget balance as % of GDP	46	-2.67	36	-4.70
Average general government consumption as % of GDP	52	15.46	38	13.82
Average annual growth rate of broad (M2) money (%):1980-96	51	78.65	38	75.03
Average trade to GDP ratio	52	71.84	38	64.44
Average of standard deviation of TOT index between 1980-94	52	38.42	38	23.44
Average debt service as % of exports	52	18.62	38	24.15
Average total external debt as % of GDP	52	74.14	38	93.29
Average GDP per capita measured in PPP dollars.	51	3939.0	38	1735.3
Total number of irregular transfers of country's top executives	52	0.88	38	1.16
Average annual corruption index between 1982-95 (lower value indicates higher corruption)	46	3.12	35	2.56
Average quality of public institutions (corruption, law and order, bureaucracy)	46	9.00	35	7.39
Average Human Development based on enrollment rates, life expectancy, and GDP per capita	43	57.20	37	43.45

Note: Group1 consists of countries with less than five (including zero) IMF programs.

Table 4
Results for Numbers of IMF Programs

	Eq. (4.1)	Eq. (4.2)	Eq. (4.3)	Eq. (4.4)	Eq. (4.5)	Eq. (4.6)
RESIM	-0.14**		-0.15**		-0.13**	
	(3.26)		(4.07)		(3.61)	
CAB5		0.05**				0.02
		(2.94)				(1.78)
CAPFL				-0.18**		
				(2.67)		
FISBUD	-0.02					
	(0.91)					
GOVC		-0.05**		-0.04**		-0.05**
		(3.21)		(2.93)		(3.89)
M2GR	-0.00					
	(1.33)					
INF		-0.00				
		(0.32)				
OPEN			-0.00			
			(1.44)			
TOT			-0.01**		-0.01	
			(2.96)		(1.73)	
TOTSD				-0.02**		-0.02**
				(4.45)		(4.89)
TDSEX			0.02**		0.03**	
			(3.43)		(4.38)	
DBTGDP				0.00*		
				(2.41)		
FEXR				0.00		
				(0.57)		
GDI					-0.03**	
					(2.73)	
YCAP						-0.23**
						(2.92)
ICRG3					0.01	
					(1.18)	
MIL						-0.00
						(0.11)
CON	1.79**	1.77**	2.66**	2.34**	2.37**	4.26**
	(10.16)	(7.44)	(6.22)	(10.02)	(5.30)	(6.36)
Pseudo R^2	0.04	0.04	0.10	0.08	0.12	0.12
χ^2 value for LR test	16.17**	19.55**	6.56**	0.62	3.20*	1.59
Observations	88	90	90	83	81	89

Note: Absolute value of z-statistics in parentheses; * significant at 5% level, ** at 1%

Table 5
Results for Years of IMF Programs

	Eq. (5.1)	Eq. (5.2)	Eq. (5.3)	Eq. (5.4)	Eq. (5.5)	Eq. (5.6)
RESIM	-0.11*		-0.14**		-0.13**	
	(2.54)		(3.90)		(3.37)	
CAB5		0.06**				0.04**
		(3.94)				(3.07)
CAPFL				-0.14*		
				(1.96)		
FISBUD	-0.03					
	(1.51)					
GOVC		-0.06**		-0.06**		-0.06**
		(4.05)		(3.99)		(4.96)
M2GR	-0.00					
	(1.63)					
INF		-0.00				
		(0.40)				
OPEN			-0.00			
			(1.89)			
TOT			-0.01**		-0.01	
			(2.82)		(1.63)	
TOTSD				-0.02**		-0.02**
				(3.59)		(4.49)
TDSEX			0.02**		0.03**	
			(3.44)		(4.89)	
DBTGDP				0.00**		
				(3.22)		
FEXR				0.01		
				(0.76)		
GDI					-0.02	
					(1.65)	
YCAP						-0.25**
						(3.20)
ICRG3					0.03*	
					(2.32)	
MIL						-0.03
						(0.97)
CON	2.14**	2.30**	3.14**	2.88**	2.34**	4.89**
	(11.10)	(9.60)	(6.91)	(11.20)	(4.55)	(7.34)
Pseudo R^2	0.03	0.05	0.07	0.06	0.09	0.11
χ^2 value for LR test	63.79**	48.17**	36.66**	17.19**	30.03**	15.55**
Observations	88	90	90	83	81	89

Note: Absolute value of z-statistics in parentheses; * significant at 5% level, ** at 1%

Table 6
Results for Numbers of IMF Programs with Lagged Policy Variables

	Eq. (6.1)	Eq. (6.2)	Eq. (6.4)	Eq. (6.6)
RESIM	-0.14** (-3.37)			
CAB5		0.05** (2.58)		0.03* (2.05)
CAPFL			-0.19** (2.64)	
FISBUD$_{75\text{-}85}$	-0.03 (-1.39)			
GOVC$_{75\text{-}85}$		-0.03 (1.84)	-0.02 (1.70)	-0.04** (2.98)
M2GR$_{75\text{-}85}$	0.00 (0.77)			
INF$_{75\text{-}85}$		0.00 (0.33)		
OPEN				
TOT				
TOTSD			-0.02** (-4.07)	-0.02** (4.63)
TDSEX				
DBTGDP			0.00 (1.87)	
FEXR			0.00 (0.12)	
GDI				
YCAP				-0.23** (2.73)
ICRG3				
MIL				0.01 (0.40)
CON	1.73** (9.85)	1.52** (6.02)	2.17** (8.71)	4.06** (5.77)
Pseudo R^2	0.05	0.02	0.07	0.10
χ^2 value for LR test	10.86**	24.05**	1.75	3.32*
Observations	84	84	81	87

Note: Absolute value of z-statistics in parentheses; * significant at 5% level, ** at 1%

Table 7
Results for Years with Lagged Policy Variables

	Eq. (7.1)	Eq. (7.2)	Eq. (7.4)	Eq. (7.6)
RESIM	-0.11** (2.80)			
CAB5		0.06** (3.37)		0.05** (3.22)
CAPFL			-0.15 (1.94)	
FISBUD$_{75-85}$	-0.04* (2.01)			
GOVC$_{75-85}$		-0.04* (2.32)	-0.03* (-2.26)	-0.04** (-3.46)
M2GR$_{75-85}$	0.00 (0.68)			
INF$_{75-85}$		0.00 (0.41)		
OPEN				
TOT				
TOTSD			-0.01** (3.07)	-0.02** (4.18)
TDSEX				
DBTGDP			0.00* (2.48)	
FEXR			0.00 (0.19)	
GDI				
YCAP				-0.25** (2.86)
ICRG3				
MIL				-0.01 (0.23)
CON	2.08** (11.34)	2.00** (7.84)	2.59** (9.54)	4.57** (6.30)
Pseudo R^2	0.04	0.03	0.04	0.09
χ^2 value for LR test	44.83**	58.98**	25.64**	23.68**
Observations	84	84	81	87

Note: Absolute value of z-statistics in parentheses; * significant at 5% level, ** at 1%

Table 8
Results for Numbers of SBA and EFF Programs

	Eq. (8.1)	Eq. (8.2)	Eq. (8.3)	Eq. (8.4)	Eq. (8.5)	Eq. (8.6)
RESIM	-0.13**		-0.14**		-0.13**	
	(2.61)		(3.12)		(2.87)	
CAB5		0.03				0.02
		(1.30)				(0.92)
CAPFL				-0.28**		
				(3.60)		
FISBUD	-0.00					
	(0.16)					
GOVC		-0.05**		-0.03		-0.05**
		(2.60)		(1.63)		(3.37)
M2GR	-0.00					
	(1.09)					
INF		-0.00				
		(0.47)				
OPEN			-0.00			
			(0.57)			
TOT			-0.01		-0.01	
			(1.79)		(1.24)	
TOTSD				-0.02**		-0.03**
				(4.17)		(4.50)
TDSEX			0.03**		0.03**	
			(3.11)		(3.49)	
DBTGDP				0.00		
				(0.61)		
FEXR				-0.00		
				(0.62)		
GDI					-0.02	
					(1.09)	
YCAP						-0.02
						(0.15)
ICRG3					0.01	
					(0.68)	
MIL						-0.01
						(0.28)
CON	1.57**	1.67**	1.92**	2.13**	1.80**	2.66**
	(7.44)	(5.80)	(3.57)	(7.95)	(3.08)	(3.03)
Pseudo R^2	0.03	0.02	0.06	0.08	0.07	0.07
χ^2 value for LR test	21.63**	27.71**	15.12**	0.47	11.64**	7.39**
Observations	88	90	90	83	81	89

Note: Absolute value of z-statistics in parentheses; * significant at 5% level, ** at 1%