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Time present and time past : a duration analysis of IMF program spells

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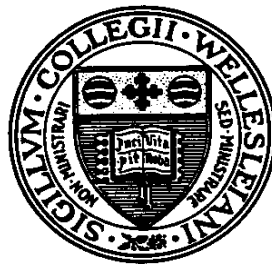
WORKING PAPER

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A DURATION ANALYSIS OF IMF PROGRAM SPELLS**

**By
Joseph P. Joyce**

Wellesley College Working Paper 2001-01

March, 2001



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Abstract

The programs of the International Monetary Fund were originally designed to provide short-term assistance to countries implementing policies to address balance of payments disequilibria. In recent decades, however, the Fund has instituted new facilities with longer time horizons, while many developing countries have adopted consecutive programs. As a result, the length of time spent by countries in IMF programs has grown, and in some cases has extended over a decade. This paper analyzes the IMF program spells for a group of emerging economies over the period of 1982 to 1997. Duration models are used to investigate the time dependence of the failure rate of the spells and the factors that affect the duration of program spells. The hazard ratio of program spells has a non-monotonic shape, first rising and then falling over time. Program duration is extended for those countries with lower per-capita income, exports concentrated in primary goods, landlocked geographic status, and stable legal processes.

JEL: F3

**TIME PRESENT AND TIME PAST:
A DURATION ANALYSIS OF IMF PROGRAM SPELLS***

Time present and time past
Are both perhaps present in time future
And time future contained in time past
--T.S. Eliot, *Four Quartets: Burnt Norton*

1. Introduction

The International Monetary Fund was established after World War II to supervise and stabilize the international monetary system. It supported countries with balance of payments disequilibria by providing short-term assistance, and the amount of time that a country could spend in a Fund program was originally limited. In recent decades, however, the Fund has instituted new programs with longer time horizons. Moreover, many developing countries have adopted consecutive programs. As a result, the length of time spent by countries in IMF programs has grown, and in some cases has extended over a decade.

The IMF has been criticized for the continued dependence of developing economies on its assistance. The new Managing Director of the IMF, Horst Köhler, has acknowledged the criticism and pledged that “IMF facilities should be designed to discourage countries from getting used to IMF loans.”¹ However, while there have been a number of studies of the effectiveness of IMF-supported policies, relatively little analysis has been undertaken on the length and nature of program spells.² Consequently, the reasons that cause some nations to

* This paper has benefited from the research assistance of Anne van Grondelle and Christina Antonopoulos, and the comments of S. Brock Blomberg and Alan Isaacs.

continue with successive Fund programs over extended periods of time are not well understood.

This paper analyzes IMF program spells for a group of emerging economies over the period of 1982 to 1998. Duration models are used to investigate the time dependence of program spells and the factors that affect the length of these spells. Our results indicate that the countries with the longest program spells possess economic and geographic characteristics that accentuate their need for external assistance, and they may require special measures to lessen this dependency.

The next section of the paper describes the institutional changes in the design of IMF programs and their time horizons. The following section provides an analysis of the factors that may affect the duration of program spells. The fourth section explains the methodology and data utilized in the paper. The fifth section presents the results of the empirical analysis, and the final section summarizes these results.

2. IMF Programs

The founders of the international monetary system established at Bretton Woods sought to avoid the destabilizing impact of the competitive depreciations of the prewar era by establishing rules governing external economic relations. IMF member countries pledged to defend par values of their currencies, which would only be changed in response to a “fundamental disequilibrium.” In the event of a balance of payments crisis, a country could draw down the foreign exchange it had paid as part of its quota subscription. When that amount was exhausted, the IMF would supply a government with additional foreign exchange

while it undertook adjustment policies to restore external balance. According to the Fund's Articles of Agreements, it would "give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguard..."³

In the 1950s, the Stand-by Arrangement (SBA) emerged as the main instrument for providing financial resources to countries with balance-of-payment problems.⁴ The usual period of an SBA is one year, consistent with the Fund's mandate to make short-term assistance available, although in some cases this has been extended to two and even three years. The interest charge paid by the borrowing government is based on market rates, and the funds are to be repaid within five years. The actual provision of the IMF's support is linked to a government's agreement to undertake a program of specific macroeconomic initiatives designed to achieve external equilibrium, and its subsequent adherence to that program. The IMF monitors compliance with the approved policies through a process known as "conditionality," and only disburses credit as a government fulfills its obligations.

The breakdown of the Bretton Woods system in the 1970s allowed more flexibility in exchange rate agreements, while capital account liberalization provided the developed economies more access to private capital markets. The Fund's lending activities became concentrated among developing nations, and in response the IMF devised new programs with longer time horizons designed to foster reform and growth.⁵ In 1974, the Extended Fund Facility (EFF) was introduced to provide credit over a three- or four-year period to countries that seek to rectify structural conditions that have led to balance of payments deficits, with a repayment period ranging from four to ten years. A country requesting an extended arrangement must present a plan of proposed structural adjustment policies, which can include

the deregulation of domestic markets and the removal of barriers to trade and investment with other countries. As with the SBAs, the provision of assistance is linked to compliance with these policies.

The Structural Adjustment Facility (SAF), established in 1986, was targeted specifically toward low-income countries. Under this facility, the IMF provided assistance on concessional terms over a three-year period to countries that undertook economic policy reforms for the purpose of promoting macroeconomic stability and growth. It was succeeded in 1988 by the Enhanced Structural Adjustment Facility (ESAF), which provided assistance over a three to four year period. These loans have an annual interest rate of 0.5 percent, and the repayments are to be made from the fifth to tenth year after disbursement. Countries receive assistance on a semiannual basis as they meet performance reviews of their proposed structural policies. This program has recently been renamed the Poverty Reduction and Growth Facility (PRGF), in order to reflect the Fund's heightened emphasis on the elimination of poverty.

At the end of the last decade, the IMF enacted new lending facilities in response to the financial crises of the 1990s. The Supplemental Reserve Facility allows the Fund to supplement its SBA and EFF arrangements in the event of an exceptional need for assistance due to a crisis in the financial markets, such as occurred in Asia in 1997. The Contingent Credit Line was designed for countries that do not currently need assistance but are concerned about the possible fallout of a financial market crisis due to contagion effects, and want credit to be available if needed. A country qualifies for a CCL by meeting eligibility criteria based on its economic policies and performance. In both programs credit is available for up to one year, but there is a surcharge to the usual IMF rate of charge. The Fund also provides emergency

assistance to countries that face natural disasters or conflict situations, or a temporary shortfall in export earnings.

As a result of the design of the various programs instituted since the 1970s, the amount of time that a country can spend in a Fund-supported program has been extended past one year. Moreover, many countries enter consecutive programs. The adoption of a new program reflects a need for additional resources, which may be due in part to the unfinished implementation of previous programs.

Compliance with a program's conditionality is often incomplete, and the amount of an IMF loan disbursed less than originally planned. Mussa and Savastano (2000) report that the actual amount of credit extended was half or less of the planned amounts in 37 percent of the 615 arrangements made between 1973 and 1997. In only 11 percent of these arrangements were the amounts disbursed three-quarters or more of the original commitment.

In the majority of the cases where the actual disbursement was significantly below the initial commitment, the programs were not completed because countries did not adhere to the policies specified when the program was initiated. There is no penalty for noncompliance besides the incomplete disbursement of assistance, however, and a country may enter a new program without penalty. Consequently, many countries have agreed to a number of IMF arrangements since the 1970s and spend years in a series of consecutive Fund programs.

3. Analysis of Program Spells

The extended nature of participation in IMF programs has been criticized on several grounds. The International Financial Institution Advisory Commission (2000), also known as

the Meltzer Commission, asserted that the long-term nature of IMF programs demonstrates that they “have not ensured economic progress...,” and actually “often hindered the development of responsible, democratic institutions that correct their own mistakes and respond to changes in external conditions.”⁶ The Overseas Development Council (2000) urged the IMF to cut back on its long-term lending and concentrate on short-term macroeconomic stabilization.

Despite these and other criticisms of the long-term duration of IMF programs, analysis of the reasons for extended program spells has been limited. A number of empirical studies, including those of Joyce (1992), Edwards and Santaella (1993), Conway (1994), Santaella (1996) and Knight and Santaella (1997), have sought to identify the distinguishing characteristics of economies when they entered IMF programs. Bird (1996), in a summary of this research, reported that these studies generally found that countries which adopt IMF programs were relatively poor and had smaller holdings of foreign reserves, an overvalued exchange rate, and a record of past involvement with the IMF.

Some recent studies have analyzed the nature of extended association with the Fund. In a study of the characteristics of frequent or “recidivist” borrowers from the IMF, Bird, Hussain, and Joyce (2000) found that such countries had relatively larger current account deficits, lower reserves and terms of trade, and greater debt-service ratios. Conway (2000) reported that a country’s participation in an IMF program is associated with external sector crises of shorter duration, but continuing reliance on IMF programs diminishes this effect.

These studies raise the question of why the program spells of some countries last longer than those of others. The probability that a spell will come to an end may depend on the passage of time, since programs are not intended to be open-ended. Moreover, some countries

that participate in IMF programs may possess characteristics that increase their demand for credit or diminish their ability to enact the changes that would mitigate the need for assistance, thus lengthening the time spent in program spells.

A more open economy, for example, would be vulnerable to foreign shocks, but might also respond more quickly to measures designed to improve the current account. Declines in the terms of trade might lead to a continuing need to finance external deficits. A reliance on exports of primary commodities would increase a country's vulnerability to falling export earnings due to a decline in the price of its primary export, and would also lower its response to a devaluation. An economy with a more diversified export base, on the other hand, would be less susceptible to a downturn in the export earnings of a particular good, and its exports would be more generally responsive to a devaluation.

Domestic economic conditions may also affect a country's willingness to enter Fund programs. A chronic history of economic policy instability may decrease a country's ability to enact the measures required to address balance of payments disequilibria. Poorer countries are most likely to enter IMF programs, because of both their need for credit and their lack of access to private capital markets. Moreover, the Fund's programs are designed to encourage longer-term access by these countries.

The decision to enter and continue Fund programs, however, is essentially a political decision prompted by economic circumstances. In recent years economists have begun to consider the impact of political, social, and other variables on economic performance. Political variables have been included, for example, in many cross-country growth studies.⁷ Knack and

Keefer (1995) and Keefer and Knack (1997) examined the influence of various institutional factors on investment and growth, while Mauro (1995) studied the role of corruption.

While these studies have focused on the impact on growth, political and institutional considerations also affect policy decisions. Roubini and Sachs (1989), for example, have shown that multiparty coalition governments in OECD nations were less able to reduce budget deficits in situations of adverse economic shocks. In the case of countries that adopt IMF programs in response to external disequilibria, divided governments may be unable to agree on stabilization and structural policies, and program spells would be more likely to continue.

The effect of more political freedom and public accountability on IMF program spells is ambiguous. On the one hand, reform policies may be more successful in an environment where the public can exercise a voice in designing such policies, and where public institutions are used to promote public welfare rather than private rent-seeking. However, a participatory and stable environment may also permit more resistance and delay, while allowing a government to continue but not complete an IMF program.

Differences within a population may also slow policy implementation. Countries with large urban centers, for example, may encounter resistance to currency devaluations if the urban residents are dependent on food imports. A high degree of urbanization would result in a continuing cycle of uncompleted programs.

Finally, the economic and political circumstances that cause some countries to rely on the Fund on a protracted basis may reflect more deep-rooted conditions. Easterly and Levine (1997), for example, reported that differences in ethnic diversity explain the variations in public policies in a range of developing economies in Asia and Africa. The impact of ethnic factors on program spells is unclear. On the one hand, it could lead to a heightened dependence on external

assistance; on the other hand, a significant increase in ethnic tension could lead to a breakdown in governance, and the termination of programs.

Demographic factors may also play a role. Higher population growth raises the demand for public services, which makes the successful implementation of measures designed to limit the growth of the public sector less likely. An increase in life expectancy, on the other hand, raises the stock of human capital and fosters growth, lessening the need for outside support.

Geographic conditions can also be crucial. Gallup, Sachs, and Mellinger (1999) have demonstrated that location and climate affect economic performance and policy choices. Tropical regions, for example, are adversely affected by the higher incidence of diseases such as malaria. Landlocked areas are disadvantaged in a number of ways, such as their lack of access to ocean transport, and consequently they are less likely to adopt open trade policies. Other factors specific to a particular geographic area can also affect the need for IMF resources.

A number of factors, therefore, may affect the duration of a country's participation in IMF programs. These economic, political, institutional, ethnic, demographic, and geographic variables may prolong or shorten a program spell. The duration of a spell should reflect both the impact of time itself on participation in Fund programs and a country's characteristics.

4. Methodology and Data

4.1 Methodology

Duration models are used to analyze events with time horizons, such as spells of unemployment or strikes.⁸ If T is a nonnegative random variable that represents the length of a spell and X is a vector of covariates associated with it, then the cumulative probability distribution of duration is the probability that the spell will end before time t :

$$F(t, X) = \Pr(T < t|X). \quad (1)$$

The corresponding density function is $f(t, X)$. The survivor function is the probability that a spell will last to or exceed time t :

$$S(t, X) = \Pr(T \geq t|X) \quad (2a)$$

$$= 1 - F(t, X). \quad (2b)$$

The hazard function is the rate at which spells terminate at some time t , given that they have lasted to t :

$$h(t, X) = \lim_{\Delta \rightarrow 0} \frac{\Pr(t \leq T \leq t + \Delta | T \geq t, X)}{\Delta} \quad (3a)$$

$$= \frac{f(t, X)}{S(t, X)}. \quad (3b)$$

The hazard function possesses positive duration dependence if $dh(t, X)/dt > 0$, and negative duration dependence if $dh(t, X)/dt < 0$. A positive dependence indicates that the likelihood that a spell will end rises as its duration increases in length; a negative duration implies that the prospect that the spell will end decreases over time.

4.2 Data

A sample of 63 emerging economies was used to obtain data on IMF program participation. The choice of countries and sample period was guided in part by the availability of data and the trade-off between breadth and depth of coverage. Countries with populations below one million and transition economies that joined the IMF in the 1990s were excluded

from the sample, as were countries not included in the *International Country Risk Guide* (ICRG), which provides data for a large number of developing economies.

The *Annual Reports* of the IMF were consulted to identify programs initiated during the period that began in 1982, the start date of the ICRG, and extending through 1997. The regular credit programs, the SBAs and the EFF programs, as well as the concessional facilities for low-income countries, the SAFs and the ESAFs, were included. Program participation on a quarterly basis was measured by whether a country was enrolled in an IMF program for at least fifteen days during a quarter. A program spell consists of the number of consecutive quarters enrolled in IMF programs.

The countries in the sample accounted for 173 program spells, and 38 of these spells were right-censored, that is, the programs were still operative at the end of the sample period. The mean spell length was ten quarters, and the longest was 43 quarters (Uganda). The distribution of the frequencies of the spells is shown in Figure 1, and spells five years and longer in length are reported in Table 1. The countries in the sample, the dates and length of their program spells, and the types of programs that the countries entered are listed in Appendix 1.

Three sets of models were estimated. The first model includes a country's economic characteristics in the covariate vector. The variables are as follows:⁹

- OPEN, exports and imports divided by GDP;
- TOT, the average terms of trade;
- PRIX, a dummy variable for economies where primary goods represent over 50 percent of total exports;

- DIVX, a dummy variable for economies with a diverse export structure where no single sector represents over 50 percent of total exports;
- MON, previous domestic monetary growth;
- YCAP, per-capita real GDP in international prices.

The values of OPEN and YCAP are measured in the year previous to the beginning of a program spell in order to avoid simultaneity, as was MON. TOT is averaged over the duration of the spell, and the two dummy variables are assumed to be fixed during the spell.

The second model includes political and institutional variables:

- COH, a measure of political cohesion based on Roubini and Sachs (1989). In a presidential system it takes the value of zero if the same party controls the executive and legislative branches, and one otherwise. In a parliamentary system, it takes the value of zero for a one-party majority government, one for a coalition government with two parties, two for a coalition government with three or more parties, and three for a minority government;¹⁰
- PART, a measurement of partisan polarization within a government, using the values negative one to identify a left-wing orientation, zero centrist, and one right-wing. In a presidential (parliamentary) system, it takes the value of zero if the president's (prime minister's) party has an absolute majority; otherwise, it is the maximum difference between the orientation of the values of the three largest government parties and the largest opposition party;
- URB, percentage of population living in urban areas;

- GPOL, the Gastil indicator of political rights which ranges from zero to seven, where one represents a regime with the highest level of freedom and seven the least;
- LAW, the ICRG indicator of the use of legal processes and institutions to adjudicate disputes ranging from zero to six, with higher scores indicating more established legal traditions;
- COR, the ICRG indicator of the existence of corruption ranging from zero to six, with higher scores indicating less corruption;
- BUR, the ICRG indicator of the quality of the bureaucracy ranging from zero to six, with higher scores indicating more autonomous public institutions.

These annual variables were averaged over the duration of the spell.

The third model includes ethnic, demographic and geographic variables:

- FRAC, a measurement of ethnolinguistic diversity which gives the probability that two randomly selected people from the same population will not belong to the same ethnolinguistic group;
- TEN, the ICRG indicator of the degree of tension in a country due to racial, nationality or language tensions, with higher scores indicating minimal tensions;
- POP, average population growth rate over the period 1980 to 1998;
- LIFE, life expectancy at birth;
- TROP, dummy variable for tropical countries;
- LAND, dummy variable for landlocked countries;
- AFR, LAT, ASIA, dummy variables for SubSaharan African, Latin American and East and South Asian countries.

IMF program spells are likely to be longer in countries with higher values of PRIX, DMON, COH, PART, URB, POP, TROP, and LAND. Program duration would be lower in response to an increase in DIVX, TOT, YCAP, and LIFE. The impact of OPEN, GPOL, LAW, COR, BUR, FRAC, TEN, and the geographic dummies is ambiguous.

5. Results

5.1 Specification of Distribution

In order to estimate duration models, a distribution of the data must be selected. The specification of the distribution determines the shape of the hazard function. Among the most commonly used in economics analysis are the Weibull distribution, which allows a rising or falling monotonic hazard rate; the exponential distribution, which yields a constant hazard function and can be considered a special case of the Weibull; and the log-logistic, which yields a non-monotonic hazard function which first increases and then decreases.¹¹

In order to choose a distribution, baseline exponential, Weibull, and log-logistic hazard functions were estimated, and ranked by the Akaike Information Criterion (AIC), where the preferred model is the one with lowest AIC value.¹² The results are reported in Table 2. The log-logistic has a lower AIC value than the exponential and Weibull distributions, indicating that the shape of the hazard function is non-monotonic.

This finding is consistent with the data presented above on the length and distribution of spell lengths as well as the design of Fund programs, since most programs are intended to end after one to three years. The hazard ratio would rise under these circumstances, and then fall for those countries that continued with additional IMF programs. The use of the log-logistic distribution, therefore, is supported by the institutional conditions.

The survival function of the log-logistic distribution is specified as:

$$S(t) = \frac{1}{1 + (\lambda t)^{\frac{1}{\sigma}}} \quad (4)$$

where $\lambda = e^{-X'\beta}$

and the corresponding hazard function takes the form:

$$h(t) = \frac{\lambda^{\frac{1}{\sigma}} (t)^{1-\sigma}}{\sigma(1 + (\lambda t)^{\frac{1}{\sigma}})} \quad (5)$$

The estimated value of σ provides another test of the shape of the hazard function. If $\sigma < 1$, the hazard has a non-monotonic shape, rising to a peak and then falling; if $\sigma > 1$, the hazard function resembles a decreasing Weibull hazard. In the baseline log-logistic estimation used to calculate the AIC value, the estimated value of σ was 0.41 with a standard error of 0.03, confirming that the hazard rate is non-monotonic. Therefore, this distribution was chosen for the empirical work, although, as reported below, other distributions were utilized as a check of robustness.

The log-logistic model is an example of an accelerated failure-time model, where the survivor function for an individual spell, $S_i(t, X)$ is related to a baseline function $S_0(t)$:

$$S_i(t, X) = S_0(t\Phi, X) \quad (6)$$

where Φ is a constant that rescales time. In an accelerated failure-time model, the logarithm of time can be expressed as a linear function of the covariates:

$$\ln(T) = X'\beta + \sigma\epsilon \quad (7)$$

where ε has a logistic distribution in the case of a log-logistic model. The coefficients are estimated through maximum likelihood estimation in order to take into account the censoring of the data.

5.2 Estimation of Covariates

An implicit assumption of this class of model is that each spell is statistically independent. However, it is possible that the length of the spells may be related to each other. In order to take this possibility into account, two variables are included in each model: PNUM, the number of previous spells that occurred during the sample period, and PDUR, the length of a previous duration if one took place during the sample period.

The first set of additional variables included in the covariate vector included the economic variables, and these results are reported in Table 3. A positive parameter (negative) estimate indicates that the duration of a spell rises (falls) as the variable increases (decreases) in value.

A model with the variables relating to the foreign sector, OPEN, TOT, PRIX, and DIVX, was estimated first. The coefficient is positive for all four variables, but it is significant only in the case of the dummy variable for exporters of primary goods. A country with a dependence on such exports is likely to spend more time in IMF programs. Primary exporters are susceptible to declining prices for their chief export, and less able to benefit from a devaluation. The two variables included to account for the interdependency of the spells, PNUM and PDUR, are insignificant.

The two domestic variables, MON and YCAP, were then added to the model. The per-capita income variable is negative and significant, but the monetary variable is not. Programs are more likely to end in a given period in a richer country for several reasons. First, the poorest nations have the most need for assistance and the least access to private capital flows. In addition, the poorest nations may have the most difficulty in completing the programs they enter. Finally, more IMF programs with longer time periods are available for these countries.

The results also include the estimates of the distribution's shape parameter, σ . The reported values are 0.38 to 0.39 and the standard error is 0.03, consistent with the initial baseline estimates of 0.41 and 0.03 and the hypothesis that the hazard rate is non-monotonic.

The political and institutional variables were tested next, and the results are reported in Table 4. First, the indicators of government cohesiveness (COH) and partisan polarization (PART) were included. Neither is significant in our sample, nor can the hypothesis that both are equal to zero be rejected. Then, the indicators of political rights (GPOL) and the rule of law (LAW) were included, as was the measurement of urbanization (URB). The first variable was insignificant, and replacing it with the Gastil indicator of civil liberties or a combination of the two did not change this finding.

The rule of law variable was significant, however, with a positive coefficient. An increase in the degree of lawfulness leads to longer program spells, which may indicate that a degree of civil stability allows a country to maintain (but not successfully finish) program status. Mecagni (1999) reported that political disruptions were responsible for a large number of the interruptions in SAF and ESAF programs.

The urbanization variable is also significant, but with a negative coefficient. If the impact of urbanization on program duration was exercised through a lower probability of

implementing Fund policies, then the sign would have been the opposite. The negative coefficient suggests that the role of urbanization on IMF program length here may reflect other characteristics, such as the level of income or export composition, which would increase program duration.

Finally, the two institutional variables, COR and BUR, were added to the model, but neither variable was significant. Apparently corruption and bureaucratic inefficiency do not affect program length. Countries with longer spells may be more orderly, but are not necessarily less corrupt or do not necessarily possess more efficient public institutions.

The two variables introduced to control for interdependency among the spells were again not significant. The estimates of σ (0.39 to 0.40) in these estimations were virtually identical to those reported in the previous table.

The last model included ethnic, demographic and geographic variables, and these results appear in Table 5. The model was first estimated with the four ethnic and demographic variables, FRAC, TEN, POP, and LIFE. Of the four, only life expectancy at birth has a significant coefficient that lowers program duration. An increase in life expectancy may lead to an increase in human resources and growth that allows a country to dispense with IMF programs.

When the two dummy variables for landlocked and tropical countries were added, the landlocked variable is significant at the 5 percent level, but the LIFE variable is no longer significant. This result may be due to a relationship among these variables. If the model is reestimated with TROP but without LAND, LIFE is significant at the 1 percent level.¹³

Countries that are landlocked have longer program spells. Radelet and Sachs (1998) and Gallup, Sachs and Mellinger (1999) point out that countries without coastal access are at a disadvantage in the processing of intermediate goods. Since shipping costs are higher, these

countries will not be able to use their relative advantage in labor costs to promote manufactured exports. The finding that primary exporters also have longer program spells is consistent with this finding.

When the three geographic variables are added, none of these are significant. The two duration dependency variables continued to be insignificant. The estimates of the σ parameter are again all below unity, ranging from 0.38 to 0.39, confirming the non-monotonic time duration of the hazard rate.

The results from the various models were then consolidated, and these results are reported in Table 6. In all these results the shape parameter σ takes the values of 0.38 to 0.39. In the first column, the results of estimation using the two economic variables PRIX and YCAP, as well as URB, LAW and LAND appear. Of the five, YCAP and LAND are significant at the 5 percent level and LAW at the 10 percent level, but PRIX and URB are not significant. This may reflect interdependency among the explanatory variables. In the second column, the results of an estimate omitting YCAP and LAND are shown. All three variables are now significant, PRIX and URB at the 5 percent level and LAW at 10 percent, and the hypothesis that all three variables are equal to zero can be rejected at the 1 percent level. However, when PRIX and URB are replaced by YCAP and LAND, the latter two variables are significant at the 1 percent level. While the impact of the composition of the export sector and urbanization on IMF program spells may be manifested through their effect on the level of income, the landlocked variable exercises an independent effect.

5.3 Robustness

The robustness of the results was examined by reestimating the model using alternative specifications of the distribution of the duration.

First, the model used for the last column of Table 6 was reestimated using the monotonic Weibull distribution. In the results reported in Table 7, YCAP, LAW, and LAND are all significant at the 1 percent level, and the parameters reported for YCAP and LAND are quite similar to those in the previous table. The significance of the covariates on duration is robust to an alternative choice of specification of the hazard rate, even though the preliminary results indicated that the Weibull should be rejected.

The model was also estimated using the partial likelihood estimation method of Cox (1972). This approach is often used to examine the effects of variables on a hazard rate without assuming a particular shape of the hazard function. In this class of model,

$$h(t, X, h_0) = \theta(X)h_0(t), \quad (8)$$

where $h_0(t)$ is a “baseline” hazard. The vector of parameters associated with X can be estimated without obtaining an estimate of the baseline hazard function. The coefficients show the impact on the baseline hazard of each of the covariates, and should have the opposite algebraic sign from those obtained from an estimation of an accelerated failure-time model such as the log-logistic. A higher (lower) hazard ratio results in a shorter (longer) duration.

The estimates of the coefficients from this semiparametric estimation and their impact on the hazard ratios are consistent with the previous results. An increase in per capita income, for example, raises the hazard function and consequently lowers the time spent in IMF

programs. More lawful countries have lower hazard ratios, as do landlocked countries, leading to longer spells. The conclusions regarding the impact of these variables on duration are not dependent on the choice of distribution for the hazard function.

Another factor that could affect the robustness of the results lies with the choice of countries for the sample.¹⁴ While the ICRG does contain data for a wide range of developing economies, a number of countries had IMF programs during this period which are not part of the ICRG and therefore not part of the sample.¹⁵ The lack of data on these countries may reflect unstable conditions (as well as a lack of interest by Western investors), which could affect the result regarding the rule of law.

To check whether all our results were affected by the selection of countries, we added the missing countries to the sample and reestimated the models without the ICRG variables (LAW, COR, BUR, TEN). The results regarding the significance of income per capita, landlocked status, primary exports, and urbanization in determining the duration of IMF program spells were confirmed by the wider sample. While the findings regarding the impact of the institutional factors may have been affected by the choice of countries, the economic and geographic characteristics appear to be robust.

6. Summary

The span of time that countries spend in various IMF programs has lengthened in recent decades, and the IMF has come under criticism for allowing some countries to establish long-term relationships with the Fund. This paper presents the results of an analysis of these spells in a sample of developing economies and the factors that affect their length.

The average spell length was two and one half years, but a number of spells lasted for five years or longer. The likelihood that a spell would end in a given period first rose as time passed, but then fell. This reflects the adoption by some countries of consecutive programs, and the lack of any penalty for failing to comply with a previous program's conditionality.

Several factors affected the duration of these spells. Extended periods of program participation are more common in the poorest nations, which have the greatest need for official external assistance. Countries that are landlocked are more likely to continue with IMF programs, possibly because their geographic circumstances place them at an economic disadvantage. There is also evidence that countries that export predominantly primary commodities and are less urban have longer spells; this finding is consistent with the hypothesis that they have not established a manufacturing base. All these countries may have civil procedures and institutions that allow them to initiate and continue the programs, but not the ability to do without IMF assistance.

The results indicate that simply making conditionality more stringent, as some have suggested, will not necessarily lessen the degree of dependence on IMF programs for those countries that use the Fund's facilities for extended periods. These countries require financial and technical assistance and are not likely to obtain them from the private sector. The international financial institutions can exercise an important role in these situations, but the IMF must determine how it can best assist the most needy countries without allowing them to become long-term wards of the Fund.¹⁶

NOTES

¹ See *IMF Survey*, August 14, 2000.

² See Haque and Khan (1998) for a survey of the studies on the effectiveness of Fund-supported policies.

³ Article I(v).

⁴ See James (1996) and Humphreys (1999) for the historical origins of Fund programs.

⁵ See Polak (1991) and Boughton (2001) on the changes over time in the IMF's objectives and policies.

⁶ See International Financial Institution Advisory Commission (2000), pp. 28-29.

⁷ Brunetti (1992) surveys the use of political variables in this literature.

⁸ See Kiefer (1988) for a survey of this class of models.

⁹ The sources of the data are reported in Appendix 2.

¹⁰ This variable and the following are taken from the World Bank's *Database of Political Institutions*. See Beck, Clarke, Groff, Keefer and Walsh (2000) for a description of the data.

¹¹ There is also a lognormal distribution which is similar to the log-logistic. See Greene (1993), Ch. 22, for an exposition of the distributions.

¹² $AIC = -2(\log \text{likelihood}) + \left(\frac{2}{\text{sample size}} \right) (\text{number of estimated parameters})$

¹³ A regression of LIFE on TROP and LAND yields significant coefficients on both at the 1 percent level: LIFE = 67.75 - 8.73 TROP - 8.80 LAND adj R² = .24

(1.36) (1.57) (1.98)

¹⁴ Knack and Azfar (2000) demonstrate how sample size and selection can affect empirical analyses of the impact of governance indicators.

¹⁵ The additional countries are Benin, Burundi, the Central African Republic, Chad, Lesotho, Mauritania, Mauritius, Nepal, and Rwanda. Adding these countries and their spells, as well as a few spells for Gambia, Guinea, and Mali that had been excluded because they took place before these countries were added to the ICRG, raises the total number of spells to 200.

¹⁶ See Bird and Joyce (2001) for an analysis of the role of the international financial institutions.

Table 1

Spells of Five Years or More

Country	Dates	Length in Qtrs	Programs
Cote d'Ivoire	1984:III – 89:II	20	SBA (4)
Hungary	1990:I – 94:IV	20	SBA, EFF, SBA
Gambia, The	1986:IV – 91:IV	21	SBA, SAF, ESAF
Ghana	1986:IV – 91:IV	21	SBA, EFF, SAF, ESAF
Guinea	1991:IV – 96:IV	21	ESAF
Honduras	1992:III – 97:III	21	ESAF
Chile	1985:III – 90:IV	22	EFF, SBA
Mali	1992:III – 97:IV	22	ESAF (2)
Madagascar	1986:IV – 92:III	23	SBA (2), SAF, ESAF
Jordan	1992:I – 97:IV	24	SBA, EFF (2)
Tunisia	1986:IV – 92:III	24	SBA, EFF
Malawi	1988:I – 94:I	25	SBA, ESAF
Poland	1990:I – 96:I	25	SBA, EFF, SBA (2)
Argentina	1991:III – 97:IV	26	SBA, EFF, SBA
Congo, Dem Rep of	1984:I – 90:II	26	SBA (4), SAF, SBA
Egypt	1991:II – 97:IV	27	SBA, EFF, SBA
Burkina Faso	1991:I – 97:IV	28	SAF, ESAF (2)
Kenya	1988:I – 94:IV	28	SBA, SAF, ESAF
Senegal	1985:I – 92:II	30	SBA (3), SAF, ESAF
Bolivia	1986:II – 94:II	33	SBA, SAF, ESAF
Niger	1983:IV – 91:IV	33	SBA (4), SAF, ESAF
Mozambique	1987:II – 95:IV	35	SAF, ESAF
Jamaica	1987:I – 96:I	37	SBA (4), EFF
Uganda	1987:II – 97:IV	43	SAF, ESAF (2)

Table 2
AIC Values for Hazard Rate Models

Distribution	AIC
Exponential	399.01
Weibull	362.09
Log-logistic	338.38

Table 3

Economic Model

	(1)	(2)
OPEN	.0039173 (.0026168)	.0037266 (.0025715)
TOT	.0040389 (.0033219)	.0046144 (.0035565)
PRIX	.4475338*** (.1466725)	.3329145** (.1560904)
DIVX	.1559824 (.1484027)	.1388328 (.1479703)
MON	-	.0000554 (.0000863)
YCAP	-	-.0000748** (.0000341)
PNUM	-.0721807 (.0477531)	-.0663646 (.0476701)
PDUR	.0123224 (.0094452)	.0120371 (.0094573)
CONSTANT	1.443205*** (.4259982)	1.617728*** (.4534396)
σ	.3888915 (.0271973)	.3839783 (.026982)
χ^2	15.08**	19.75**
Log-likelihood	-161.6452	-158.67678

Note: The dependent variable is the number of consecutive quarters spent in IMF programs. Standard errors are reported in parentheses. The χ^2 statistic tests the hypothesis that all the estimated coefficients are equal to zero.

* significant at 10% level, ** significant at 5% level, *** significant at 1% level

Table 4

Political and Institutional Model

	(1)	(2)	(3)
COH	-.04331 (.0900637)	-.0695816 (.0931088)	-.0433988 (.0938427)
PART	-.0926395 (.0830085)	-.0719649 (.0862139)	-.0854585 (.0859332)
GPOL	-	.0218154 (.0404487)	.0290178 (.0418289)
LAW	-	.1381608** (.057496)	.1870181** (.0738346)
URB	-	-.0074873** (.0030911)	-.0069353** (.0031066)
COR	-	-	.0071738 (.0709842)
BUR	-	-	-.1016345 (.0619032)
PNUM	-.0615975 (.0513764)	-.0631032 (.051949)	-.0723102 (.0530949)
PDUR	.0122997 (.0094495)	.0131112 (.009594)	.0123059 (.009476)
CONSTANT	2.316141*** (.0886526)	2.201542*** (.3170058)	2.268884** (.3423439)
σ	.4014145 (.0279091)	.3885095 (.0271456)	.385135 (.0269606)
χ^2	6.58	16.74**	19.47**
Log-likelihood	-165.89811	-160.81428	-159.45129

Note: See Table 3.

Table 5
Ethnic, Demographic, and Geographic Model

	(1)	(2)	(3)
FRAC	-.0047029 (.259875)	-.0477665 (.2539502)	-.2055239 (.2844288)
TEN	-.0059521 (.0506551)	-.0180541 (.0496403)	.0011335 (.0554831)
POP	-.0590978 (.0828955)	-.0436009 (.0888536)	-.0553596 (.090186)
LIFE	-.0185406** (.0078483)	-.0121349 (.0080271)	-.0042726 (.0104509)
TROP	-	.0819268 (.1470395)	.2058201 (.1742197)
LAND	-	.4622912** (.1818719)	.4246708** (.1870978)
SAFR	-	-	.1215739 (.3144155)
LTAM	-	-	-.23292 (.2216597)
ASIA	-	-	.1088677 (.241355)
PNUM	-.0526277 (.0505689)	-.0522476 (.0495511)	-.0427509 (.049027)
PDUR	.0120179 (.0095897)	.0093342 (.0095907)	.0074859 (.0094632)
CONSTANT	3.529396*** (.6296919)	3.067543*** (.6438817)	2.567146*** (.7361764)
σ	.3934182 (.0275392)	.3828332 (.026931)	.3779694 (.02665)
χ^2	12.53*	19.10**	22.82**
Log-likelihood	-162.92051	-159.63528	-157.7758

Note: See Table 3.

Table 6
Consolidated Model

	(1)	(2)	(3)
PRIX	.1491667 (.1292623)	.3088761** (.1220602)	-
YCAP	-.0001211** (.0000589)	-	-.0001167*** (.0000361)
URB	.0018443 (.004606)	-.0068458** (.0030027)	-
LAW	.096945* (.0546993)	.0941493* (.0535737)	.0992466* (.0548657)
LAND	.4119974** (.187211)	-	.4583662*** (.1760302)
CONSTANT	2.100855 (2.100855)	2.211411*** (.185111)	2.21734*** (.1512519)
σ	.382231 (.0265688)	.3906576 (.0271687)	.3840614 (.0266909)
χ^2	23.93***	15.64***	22.27***
Log-likelihood	-157.22311	-161.36599	-158.05256

Note: See Table 3.

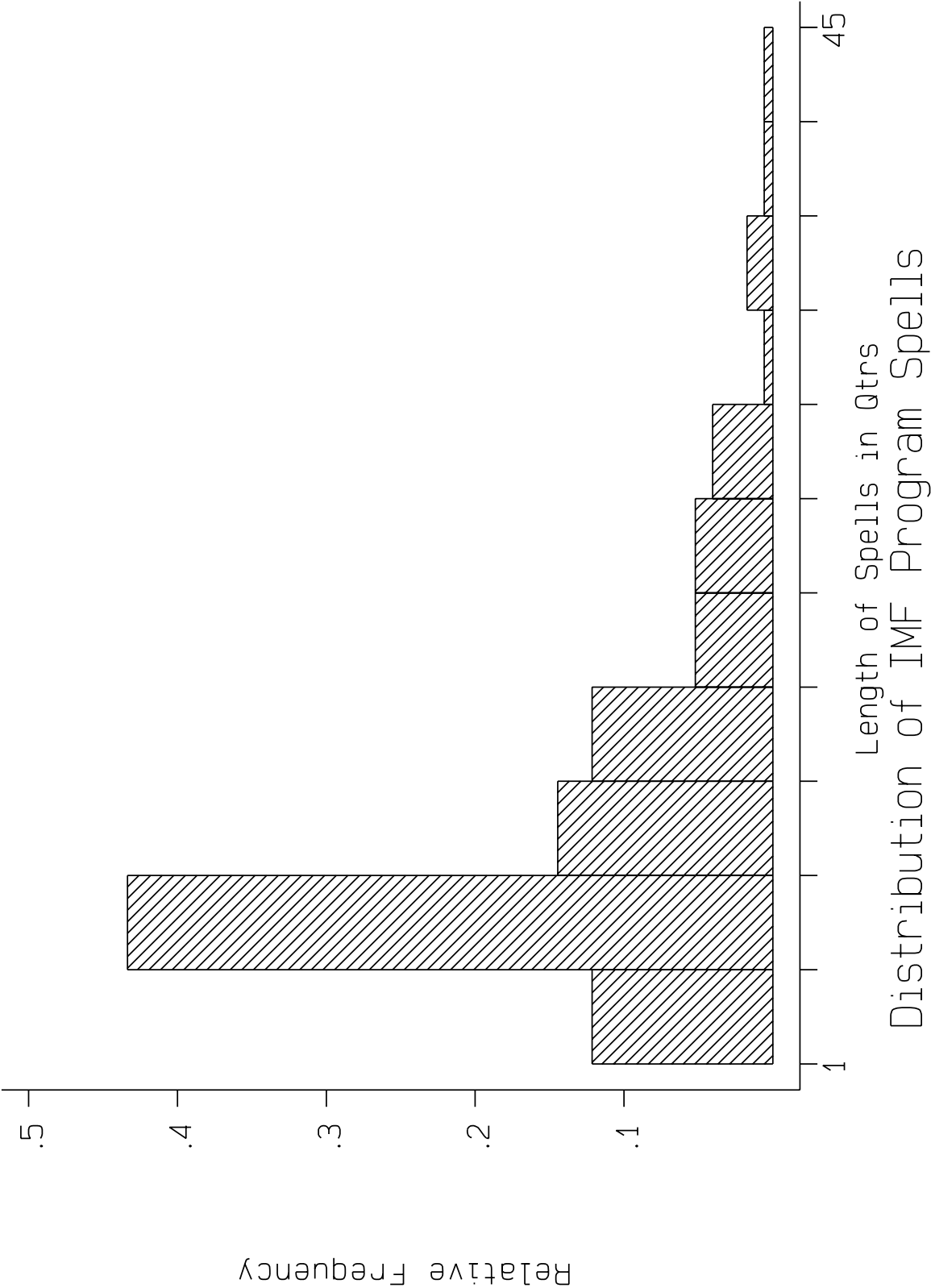
Table 7

Tests of Robustness

	Weibull	Cox
YCAP	-.0001435*** (.0000332)	.0001964*** (.0000571)
LAW	.1534011*** (.4463003)	-.2101264** (.0867076)
LAND	.4463003*** (.1633569)	-.606624** (.2786062)
CONSTANT	2.460991*** (.1364133)	-
χ^2	33.56***	22.48***
Log-likelihood	-164.2628	-568.89996

Note: See Table 3.

Figure 1



Appendix 1

IMF Program Spells

Country	Dates-Qtrs	Qtrs	Programs
Algeria	1989:II – 90:II	5	SBA
	1991:II – 92:I	4	SBA
Argentina	1994:II - 97:IV	15	SBA, EFF
	1983:I - 84:I	5	SBA
	1985:I - 86:II	6	SBA
	1987:III - 88:III	5	SBA
	1989:IV - 91:I	6	SBA
	1991:III - 97:IV	26	SBA, EFF, SBA
	1983:II - 83:III	2	SBA
Bangladesh	1985:IV - 90:I	18	SBA, SAF
	1990:III - 93:III	13	ESAF
	1986:II - 94:II	33	SBA, SAF, ESAF
Bolivia	1995:I - 97:IV	12	ESAF
	1983:I - 86:I	13	EFF
Brazil	1988:III - 90:I	7	SBA
	1992:I - 93:III	7	SBA
	1991:I - 93:II	10	SBA (2)
Bulgaria	1994:II - 95:I	4	SBA
	1996:III - 97:IV	6	SBA (2)
	1991:I - 97:IV	28	SAF, ESAF (2)
Burkina Faso	1988:IV - 90:II	7	SBA
Cameroon	1992:I - 92:III	3	SBA
	1994:I - 96:III	11	SBA (2)
	1997:III - 97:IV	2	ESAF
	1983:I - 84:IV	8	SBA
Chile	1985:III - 90:IV	22	EFF, SBA
Congo, Dem Rep of	1984:I - 90:II	26	SBA (4), SAF, SBA
Congo, Rep of	1986:III - 88:II	8	SBA
	1990:III - 92:II	8	SBA
	1994:III - 95:II	5	SBA
	1996:III - 97:IV	6	ESAF
	1985:I - 86:I	5	SBA
Costa Rica	1987:IV - 90:II	11	SBA (2)
	1991:II - 92:III	6	SBA
	1993:II - 94:I	4	SBA
	1995:IV - 97:I	6	SBA
Cote d'Ivoire	1984:III - 89:II	20	SBA (4)
	1989:IV - 91:II	7	SBA
	1991:IV - 92:III	4	SBA
	1994:I - 97:II	14	ESAF

Dominican Republic	1983:I - 86:I	13	EFF, SBA
	1991:III - 93:I	7	SBA
	1993:III - 94:I	3	SBA
Ecuador	1983:III - 84:III	5	SBA
	1985:I - 86:I	5	SBA
	1986:III - 87:II	4	SBA
	1988:I - 89:I	5	SBA
	1989:III - 91:I	7	SBA
	1991:IV - 92:IV	5	SBA
	1994:II - 95:IV	7	SBA
Egypt	1987:II - 88:IV	7	SBA
	1991:II - 97:IV	27	SBA, EFF, SBA
El Salvador	1982:III - 83:III	5	SBA
	1990:III - 91:III	5	SBA
	1992:I - 94:IV	12	SBA, SBA (2)
	1995:III - 96:III	5	SBA
	1997:I - 97:IV	4	SBA
Ethiopia	1992:IV - 95:IV	13	SAF
	1996:IV - 97:IV	5	ESAF
Gabon	1987:I - 88:IV	8	SBA
	1989:III - 91:I	7	SBA
	1991:IV - 93:I	6	SBA
	1994:II - 95:I	4	SBA
	1995:IV - 97:IV	9	EFF
Gambia, The	1984:II - 85:II	5	SBA
	1986:IV - 91:IV	21	SBA, SAF, ESAF
Ghana	1983:III - 85:IV	10	SBA, SBA (2)
	1986:IV - 91:IV	21	SBA, EFF, SAF, ESAF
	1995:III - 97:IV	10	ESAF
Guatemala	1983:III - 84:IV	6	SBA
	1988:IV - 90:I	6	SBA
	1993:I - 94:I	5	SBA
Guinea	1991:IV - 96:IV	21	ESAF
	1997:I - 97:IV	4	ESAF
Guinea-Bissau	1987:IV - 90:IV	13	SAF
	1995:I - 97:IV	12	ESAF
Haiti	1982:III - 85:III	13	SBA (2)
	1987:I - 89:IV	12	SAF
	1989:IV - 90:IV	5	SBA
	1995:I - 96:I	5	SBA
	1996:IV - 97:IV	5	ESAF
Honduras	1982:IV - 83:IV	5	SBA
	1990:III - 92:I	7	SBA
	1992:III - 97:III	21	ESAF
Hungary	1982:IV - 84:IV	9	SBA (2)
	1988:II - 89:II	5	SBA
	1990:I - 94:IV	20	SBA, EFF, SBA
	1996:I - 97:IV	8	SBA

India	1991:I - 91:II	2	SBA
	1991:IV - 93:II	7	SBA
Indonesia	1997:IV - 97:IV	1	SBA
Jamaica	1987:I - 96:I	37	SBA (4), EFF
Jordan	1989:III - 90:IV	6	SBA
	1992:I - 97:IV	24	SBA, EFF (2)
Kenya	1985:I - 86:I	5	SBA
	1988:I - 94:IV	28	SBA, SAF, ESAF
	1996:II - 97:IV	7	ESAF
Korea	1983:III - 85:I	7	SBA
	1985:III - 87:I	7	SBA
	1997:IV - 97:IV	1	SBA
Madagascar	1984:III - 86:III	9	SBA (2)
	1986:IV - 92:III	23	SBA (2), SAF, ESAF
	1996:IV - 97:IV	5	ESAF
Malawi	1982:III - 86:III	17	SBA, EFF
	1988:I - 94:I	25	SBA, ESAF
	1994:IV - 95:II	3	SBA
	1995:IV - 97:IV	9	ESAF
Mali	1983:IV - 85:II	7	SBA
	1985:IV - 87:I	6	SBA
	1988:III - 91:III	13	SBA, SAF
	1992:III - 97:IV	22	ESAF (2)
Mexico	1983:I - 85:IV	12	EFF
	1986:IV - 88:I	6	SBA
	1989:II - 93:II	17	EFF
	1995:I - 97:I	9	SBA
Morocco	1983:IV - 85:I	6	SBA
	1985:III - 89:IV	18	SBA (3)
	1990:III - 91:I	3	SBA
	1992:I - 93:I	5	SBA
Mozambique	1987:II - 95:IV	35	SAF, ESAF
	1996:III - 97:IV	6	ESAF
Nicaragua	1991:IV - 93:I	6	SBA
	1994:III - 97:II	12	ESAF
Niger	1983:IV - 91:IV	33	SBA (4), SAF, ESAF
	1994:III - 95:III	5	SBA
	1996:II - 97:IV	7	ESAF
Nigeria	1987:I - 88:I	5	SBA
	1989:I - 90:II	6	SBA
	1991:I - 92:I	5	SBA
Pakistan	1989:I - 91:IV	12	SBA, SAF
	1993:III - 97:IV	18	SBA, EFF, ESAF, SBA, ESAF
Panama	1982:II - 84:IV	11	SBA (2)
	1985:III - 87:I	7	SBA
	1992:I - 94:III	11	SBA
	1995:IV - 97:I	6	SBA
	1997:IV - 97:IV	1	EFF

Papua New Guinea	1990:II - 92:III	10	SBA (2)
	1995:III - 97:IV	10	SBA
Peru	1982:II - 85:III	14	EFF, SBA
	1993:II - 96:I	12	EFF
	1996:III - 98:IV	10	EFF
Philippines	1983:I - 84:I	5	SBA
	1984:IV - 88:III	16	SBA (2)
	1989:II - 93:I	16	EFF, SBA
	1994:II - 97:IV	15	EFF, SBA
Poland	1990:I - 96:I	25	SBA, EFF, SBA (2)
Senegal	1985:I - 92:II	30	SBA (3), SAF, ESAF
	1994:I - 97:IV	16	SBA, ESAF
Sierra Leone	1986:IV - 89:IV	13	SBA, SAF
	1994:III - 97:IV	14	SAF, ESAF
South Africa	1992:IV - 93:IV	5	SBA
Sri Lanka	1988:I - 91:I	13	SAF
	1991:III - 95:III	17	ESAF
Tanzania	1991:III - 94:III	13	ESAF
	1996:IV - 97:IV	5	ESAF
Thailand	1981:II - 83:IV	11	SBA (2)
	1997:III - 97:IV	2	SBA
Togo	1994:IV - 98:II	15	ESAF
Trinidad & Tobago	1989:I - 91:I	9	SBA (2)
Tunisia	1986:IV - 92:III	24	SBA, EFF
Turkey	1994:III - 96:I	7	SBA
Uganda	1987:II - 97:IV	43	SAF, ESAF (2)
Uruguay	1983:II - 85:II	9	SBA
	1985:IV - 87:I	6	SBA
	1990:IV - 92:I	6	SBA
	1992:III - 93:II	4	SBA
	1996:I - 97:IV	8	SBA (2)
	1989:III - 93:I	15	EFF
Venezuela	1996:III - 97:II	4	SBA
	1983:II - 87:II	17	SBA (3)
Zambia	1995:IV - 97:IV	9	SAF, ESAF
Zimbabwe	1983:II - 84:III	6	SBA
	1992:I - 95:III	15	EFF (2), ESAF

Source: IMF *Annual Report*, various issues.

APPENDIX 2

DATA DEFINITIONS AND SOURCES

The variables used in the empirical analysis and their sources are:

ASIA	Bangladesh, India, Indonesia, Korea, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand
BUR	IRIS-3 File, <i>International Country Risk Guide</i>
COH	<i>Database of Political Institutions</i> , World Bank
COR	IRIS-3 File, <i>International Country Risk Guide</i>
DIVX	<i>World Development Report</i>
DMON	<i>World Development Indicators</i>
DPOP	<i>World Development Indicators</i>
DUR	IMF <i>Annual Report</i> , various issues
FRAC	<i>Atlas Nordov Mir</i> (1964), used in Easterly and Levine (1997), and supplemented by author's calculations
GPOL	Freedom House, <i>Freedom in the World</i> , various issues
LAND	Bolivia, Burkina Faso, Democratic Republic of Congo, Hungary, Malawi, Mali, Niger, Uganda, Zambia, Zimbabwe
LATM	Argentina, Bolivia, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Trinidad & Togo, Uruguay, Venezuela
LAW	IRIS-3 File, <i>International Country Risk Guide</i>
LIFE	<i>Global Development Finance</i> and <i>World Development Indicators</i>
OPEN	<i>Global Development Finance</i> and <i>World Development Indicators</i>
PDUR	Length of previous duration, if applicable

PNUM	Number of previous spells
PART	<i>Database of Political Institutions</i> , World Bank
PRIX	<i>World Development Report</i>
SAF	Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Cote D'Ivoire, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe
TEN	IRIS-3 File, <i>International Country Risk Guide</i>
TOT	World Bank
TROP	Bolivia, Brazil, Burkina Faso, Cameroon, Democratic Republic of Congo, Republic of Congo, Costa Rica, Cote D'Ivoire, Dominican Republic, Ecuador, El Salvador, Ethiopia, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, Indonesia, Jamaica, Kenya, Madagascar, Malawi, Mali, Mexico, Mozambique, Nicaragua, Niger, Nigeria, Panama, Papua New Guinea, Peru, Philippines, Senegal, Sierra Leone, Sri Lanka, Tanzania, Thailand, Togo, Trinidad & Tobago, Uganda, Venezuela, Zambia, Zimbabwe
URB	<i>Global Development Finance and World Development Indicators</i>
YCAP	<i>Penn World Table</i> (Mark 5.6), updated by World Bank

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