Time Past and Time Present: a Duration Analysis of IMF Program Spells

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Abstract

The programs of the IMF were designed to provide short-term assistance to countries with balance-of-payments disequilibria. Over time, however, the Fund instituted new facilities with longer time horizons, while many countries adopted consecutive programs. As a result, the length of time spent by countries in IMF programs has grown. This paper analyzes IMF program spells for a group of developing economies over the period of 1982–2000. Duration models are used to investigate the time dependence of the spells and the factors that affect their duration. The hazard ratio of spells has a nonmonotonic shape, first rising and then falling. Spell duration is independent of previous spell length or the number of spells. Program duration is extended for countries with lower income, exports concentrated in primary goods, landlocked geographic status and autocratic regimes. Governments that are polarized have shorter spells, which may reflect a breakdown in governance.

> 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 (IMF) was established after World War II to supervise and stabilize the international monetary system. It supports countries with balance-of-payments disequilibria by providing short-term credit, 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 former Managing Director of the IMF, Horst Köhler, 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,[2] less analysis has been undertaken on the length of time that countries spend in IMF programs. Consequently, the reasons that cause some nations to continue with successive Fund programs over extended periods of time are not well understood.

This paper analyzes IMF program spells for a group of developing economies over the period of 1982 to 2000. Previous studies have established that these countries have a continuing need for Fund resources due to recurring deficits and insufficient foreign

exchange reserves. This paper extends this work to examine the factors that heighten this dependence. Duration models are used to investigate the time dependence of program spells and the factors that affect the length of these spells.

The reported results demonstrate that the hazard rate of Fund programs initially rises and then falls. This finding establishes that there is no institutional mechanism that terminates programs after a fixed length of time. The length of a program spell is independent of a previous spell's duration or the number of previous spells. In addition, program spells are extended in countries with structural features that accentuate their need for external assistance, while political characteristics also affect the length of the program spell.

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 disequilbrium." 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 safeguards . . ." (Article I(v)).

In the 1950s, the Stand-By Arrangement (SBA) emerged as the main instrument for providing financial resources to countries with balance-of-payments problems.[3] The usual period of an SBA is one to two years, consistent with the Fund's mandate to make short-term assistance available. The interest charge paid by the borrowing government is based on short-term 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 measures 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.[4] In 1974, the Extended Fund Facility (EFF) was introduced to provide credit over a three-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 may 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. This program was renamed the Poverty Reduction and Growth Facility (PRGF) in 1999 in order to reflect the Fund's heightened emphasis on the elimination of poverty. These loans have an annual interest rate of 0.5%, and the repayments are to be made during the sixth to tenth year after disbursement. Countries receive assistance on a semi-annual basis as they meet performance reviews of their proposed structural policies.

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 were concerned about the possible fallout of a financial market crisis due to contagion effects, and wanted credit to be available if needed.[5] 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 less than half of the planned amounts in 37% of the 615 arrangements made between 1973 and 1997. They interpret the majority of these as ". . . cases where the program went off track because policies deviated significantly from those agreed with the IMF . . ."[6] There is no penalty for noncompliance besides the incomplete disbursement of assistance, however, and a country may enter a new program. Consequently, many countries have agreed to a number of IMF arrangements since the 1970s and spend years in a series of consecutive Fund programs.

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."[7] 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. Conway (2000) found 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. Conway (2003) also reported evidence that the duration of IMF spells is reduced by prior program participation. Vreeland (2003) modeled the joint decisions of the IMF and a borrowing country to initiate a program and whether to continue it. He

found that a country's decision to continue a program is influenced by its fiscal budget position and external debt service, while the IMF is more likely to continue programs in countries with lower holdings of foreign reserves. In a study of the economic characteristics of frequent or "recidivist" borrowers from the IMF, Bird et al. (2004) found that such countries had relatively larger current account deficits, lower reserves, and greater debt–service ratios.

The IMF's recently instituted Independent Evaluation Office selected the issue of extended borrowing from the Fund as the focus of its first report, *Evaluation of Prolonged Use of IMF Resources* (IMF, 2002a). The report's authors reported that prolonged use is a result of several factors, including the institution of new Fund programs with expanded goals. The report noted that frequent borrowing can have adverse consequences for both the borrowing country and the IMF, and proposed a number of measures to limit prolonged use. Mody and Saravia (2003) have found that frequent usage of Fund programs weakens the improved access to capital markets that an IMF program usually entails.

Another focus of research has been the implementation of IMF programs. Recent studies by Edwards (2001), Ivanova et al. (2003), and Joyce (2003) have sought to identify the factors that affect the execution of the policies contained in the initial Letter of Intent and the subsequent disbursal of credit. These papers have found that political factors, such as the influence of special-interest groups or a lack of political cohesion within a government, hinder the successful completion of a Fund program.

This paper bridges these two areas of research. Longer IMF program spells reflect a continuing need for external resources, as evidenced by the recurring deficits in the balance of payments of these countries. This may reflect structural characteristics of the economy, or political features that hinder the implementation of stabilization and reform policies. Identifying the factors that promote prolonged usage would assist the IMF in designing conditionality that is appropriate for a country, a goal listed in the Fund's recently issued "Guidelines on Conditionality" (2002b).

3. Analysis of Program Spells

The recurring use of IMF resources may be based on a country's structural economic characteristics. 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. A more open economy is vulnerable to foreign shocks, but might also respond more quickly to measures designed to improve the current account. 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.

Geographic conditions can also be crucial. Gallup et al. (1999) and Mellinger et al. (2000) 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.

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 variables on the outcome of reform measures.

Political factors have also been incorporated into models of IMF program selection as well as studies of program implementation.

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.

The cohesion of a government and its political strength can affect a country's ability to implement policies. Divided governments are unable to agree on stabilization and structural measures, and programs could end prematurely. Edwards and Tabellini (1991) reported that the success of stabilization programs is related to the political and institutional conditions of the countries where these measures are introduced.

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

4. Methodology and Data

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:

$$F(t, X) = \Pr(T < t \,|\, X). \tag{1}$$

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

$$S(t, X) = \Pr(T \geq t \,|\, X). \tag{2a}$$

$$= 1 - F(t, X). \tag{2b}$$

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

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

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

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.

Data

A sample of 62 developing economies, which are listed in the Appendix with the sources of the data, 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 tradeoff between breadth and depth of coverage. Countries with populations below 1 million and transition economies that joined the IMF in the 1990s were excluded from the sample.

The *Annual Reports* of the IMF were consulted to identify programs initiated between 1982 and 1997, and extending through 2000. 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.[9] Program participation on a quarterly basis was measured by whether a country was enrolled in an IMF program for at least 15 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 177 program spells, and 13 of these spells were right-censored; i.e. the programs were still operative at the end of the sample period. The mean spell length was 11.8 quarters, and the longest was 40 quarters and still continuing at the end of the period (Burkina Faso). Spells five years and longer in length are reported in Table 1.

5. Results

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 nonmonotonic hazard function which first increases and then decreases.

In order to choose a distribution, the 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 the lowest AIC value.[10] 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 nonmonotonic.

This finding is consistent with the data 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:

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

where $\lambda = e^{-X\beta}$, and the corresponding hazard function takes the form:

Table 1. IMF Program Spells of Five Years or More

Country	Dates	Length in quarters	Programs
Egypt	1993:IV–1998:III	20	EFF, SBA
Hungary	1990:I–1994:IV	20	SBA, EFF, SBA
Côte D'Ivoire	1984:III–1989:II	20	SBA (4)
Honduras	1992:III–1997:III	21	ESAF
Kenya	1988:I–1993:I	21	SBA, SAF, ESAF
Gambia, The	1986:IV–1991:IV	21	SBA, SAF, ESAF
Ghana	1995:III–2000:IV	22	ESAF (2)
Ghana	1986:IV–1992:I	22	SBA, EFF, SAF, ESAF
Chile	1985:III–1990:IV	22	EFF, SBA
Madagascar	1986:IV–1992:II	23	SBA, SAF, SBA, ESAF
Bolivia	1995:I–2000:IV	24	ESAF (2)
Tunisia	1986:IV–1992:III	24	SBA, EFF
Malawi	1988:I–1994:I	25	SBA, ESAF (2)
Congo, Dem. Rep.	1984:I–1990:II	26	SBA (4), SAF, SBA
Philippines	1994:II–2000:IV	27	SBA, EFF, SBA
Pakistan	1993:III–2000:IV	30	SBA, EFF, SBA (2)
Senegal	1985:I–1992:II	30	SBA, EFF, ESAF, SBA, ESAF, EFF, SBA
Sri Lanka	1988:I–1995:III	31	SAF, ESAF
Bolivia	1986:II–1994:II	33	SBA, SAF, ESAF
Niger	1983:IV–1991:IV	33	SBA (4), SAF, ESAF
Mali	1992:III–2000:IV	34	ESAF (3)
Mozambique	1987:II–1995:IV	35	SAF, ESAF
Jordan	1992:I–2000:IV	36	SBA, EFF (3)
Guinea	1991:IV–2000:IV	37	ESAF (2)
Jamaica	1987:I–1996:I	37	SBA (4), EFF
Argentina	1991:III–2000:IV	38	SBA, EFF, SBA, EFF
Burkina Faso	1991:I–1997:IV	40	SAF, ESAF (3)

Table 2. AIC Values for Hazard Rate Models

Distribution	AIC
Exponential	447.40
Weibull	414.66
Log-logistic	381.26

$$h(t) = \frac{\lambda^{\frac{1}{\sigma}}(t)^{\frac{1}{\sigma}-1}}{\sigma\left(1+(\lambda t)^{\frac{1}{\sigma}}\right)}.$$

(5)

The estimated value of σ provides another test of the shape of the hazard function. If $\sigma < 1$, the hazard has a nonmonotonic 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 0.40 with a standard error of 0.03, confirming that the hazard rate is nonmonotonic. Therefore, this distribution was chosen for the empirical analysis.

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 $S_0(t)$:

$$S_i(t, X) = S_0(t\Phi, X), \tag{6}$$

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:

$$\ln(T) = X'\beta + \sigma\varepsilon, \tag{7}$$

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.

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. If either variable is positive and significant, then the incidence or length of previous spells would lead to longer spells in the future, and this could be construed as an indication that the programs were not successful in accomplishing their aims; conversely, negative and significant coefficients would indicate the opposite.

The model was tested by introducing different sets of variables, beginning with the first set of explanatory variables; insignificant variables were dropped and significant variables kept as new variables were tested. The 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. The estimated values of the constant are not reported to conserve space.

A model with structural economic and geographic characteristics was estimated first. The variables are *YCAP*, per capita real GDP in international prices; *OPEN*, exports and imports divided by GDP; *PRIX*, a dummy variable for economies where primary goods represent over 50% of total exports; *TROP*, a dummy variable for tropical countries; and *LAND*, a dummy variable for landlocked countries. The values of *YCAP* and *OPEN* in the year previous to the beginning of a program spell are used. In the initial estimations with all the variables included in one equation, the coefficients on the income and primary exports were significant at the 10% level, while the landlocked status barely missed the cutoff. Since the primary exports and landlocked variables are correlated and both have an impact on income, the model was re-estimated first with the income per capita variable and landlocked variables (equation 3.1), and then with the primary exports and openness variables (equation 3.2).

The coefficient on the per capita income variable is negative and significant at the 5% level. 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.

Table 3. Log-Logistic Model

	Equation					
	3.1	*3.2*	*3.3*	*3.4*	*3.5*	*3.6*
YCAP	**−0.00**	—	—	—	—	—
	(0.00)					
OPEN	—	0.00	—	—	—	—
		(0.00)				
PRIX	—	**0.38**	**0.25**	**0.24**	**0.26**	*0.22*
		(0.11)	(0.12)	(0.12)	(0.12)	(0.12)
LAND	**0.39**	—	*0.29*	*0.29*	*0.31*	*0.29*
	(0.16)		(0.17)	(0.17)	(0.17)	(0.17)
TROP	0.06	—	—	—	—	—
	(0.13)					
POLITY	—	—	*−0.01*	—	—	—
			(0.01)			
GAST	—	—	—	*0.03*	—	—
				(0.02)		
COH	—	—	—	—	−0.06	—
					(0.07)	
POLAR	—	—	—	—	—	**−0.16**
						(0.08)
PNUM	−0.02	−0.02	0.01	0.00	−0.03	0.01
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.05)
PDUR	0.01	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
σ	0.38	0.39	0.38	0.38	0.38	0.38
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
χ^2	**16.72**	**13.55**	**17.60**	**17.95**	**16.98**	**18.47**
Log-likelihood	−180.27	−180.80	−179.20	−179.66	−172.86	−168.49
No. of obs.	177	176	176	177	169	165

Note: Standard errors are reported in parentheses. Bold indicates significance at the 5% level; italic indicates significance at the 10% level.

The landlocked variable is positive and significant; countries that are landlocked have longer program spells. Radelet and Sachs (1998) and Gallup et al. (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 primary exports variable is positive, indicating that a country with a dependence on such exports is likely to spend more time in IMF programs. Primary exporters are particularly vulnerable to declining prices for their chief export, and less able to benefit from devaluation. The IMF's (2002a) econometric analysis of the characteristics of prolonged users also found that these countries had a higher concentration of primary exports.

The openness and tropical country variables are not significant in any of the specifications of the model.

The results include the estimates of the distribution's shape parameter, σ. The reported values in equations 3.1 and 3.2 are 0.38 and 0.39 with standard errors of 0.02, consistent with the initial baseline estimates of 0.40 and the hypothesis that the hazard rate is nonmonotonic. The two variables included to account for the possible interdependency of the spells, *PNUM* and *PDUR*, are insignificant. There is no impact from the occurrence or length of previous spells on a spell's duration.

Indicators of the type of political regime in power during the first year of the program were then included. The variables were introduced separately in equations 3.3 and 3.4 in order to avoid collinearity. The variable *POLITY* is an indicator of relative democracy reported by the Polity IV Project, and ranges in value from +10 (high democracy) to −10 (high autocracy). The coefficient on the variable is negative and significant at the 10% level.

The *POLITY* variable was then replaced with the combined Gastil indicators of political and civil rights, *GASTIL*, which are published by Freedom House. Each indicator ranges from one to seven, with higher values indicating fewer liberties. This variable was positive and also significant at the 10% level, consistent with the previous result. The empirical results, therefore, provide evidence that democratic regimes spend less time in Fund programs, and are consistent with Vreeland's (2003) finding that dictatorships are more likely to continue IMF programs.

These results do not directly indicate whether the program spells ended because the programs were successful or for some other reason. However, other recent studies have examined the impact of democratic regimes on program completion and governance in general. Joyce (2003) reported evidence that program completion rates are higher under democratic regimes. Olson (1991) and Quinn and Wooley (2001) claim that democracies are more likely to have stable economic growth than autocracies, while Rivera-Batiz (2002) presents evidence that democracy has a positive effect on governance. The results reported in this study, therefore, are consistent with those reported in other studies.

The result for the parameter σ is 0.38 in both estimations with a standard error of 0.02. The coefficients for the two variables *PNUM* and *PDUR* are again insignificant.

The next set of variables in equations 3.5 and 3.6 examine the impact of cohesion within a government on program spells, using indicators for the first year of a program obtained from the World Bank's *Database of Political Institutions*.[11] The first, *COH*, is based on the work of Roubini and Sachs (1989), and takes the value of zero when the same party controls the executive and legislative branches. It takes the value of one in a presidential system when the branches of government are split, and the values one, two or three when there are coalitions or minority governments in parliamentary systems. The second variable, *POLAR*, is based on an assignment of orientation values (left equals zero, center one and right-wing two) to the two veto players, and taking the absolute difference between these values.[12]

The coefficient on the cohesiveness variable is negative but not significant. However, the polarization variable is negative and significant at the 5% level. Governments that are internally divided along ideological lines have shorter program spells.

This finding can be linked to the literature on the determinants of the completion of Fund programs. Edwards (2001) observed that IMF programs are more likely to be suspended in countries with fractionalized legislatures. Similarly, Ivanova et al. (2003) reported that a lack of political cohesion hindered the completion of an IMF program, while Joyce (2003) found that polarization was linked to lower rates of program completion. In view of those findings, the result reported here is most likely a reflection of a breakdown in governance and the ability to implement IMF programs.

The two duration dependency variables continued to be insignificant. The estimate of the σ parameter is 0.38 in both equations, with a standard error of 0.03.

Robustness

The robustness of the results was examined by re-estimating the model 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,

$$h(t, X, h_0) = \theta(X)h_0(t), \tag{8}$$

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 reported in Table 4 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.

Table 4. Cox Model

	Equation					
	4.1	*4.2*	*4.3*	*4.4*	*4.5*	*4.6*
YCAP	**0.00**	—	—	—	—	—
	(0.00)					
OPEN	—	−0.00	—	—	—	—
		(0.00)				
PRIX	—	**−0.43**	−0.23	−0.24	−0.24	−0.24
		(0.17)	(0.18)	(0.18)	(0.19)	(0.19)
LAND	**−0.50**	—	*−0.45*	*−0.44*	*−0.45*	*−0.46*
	(0.25)		(0.26)	(0.26)	(0.26)	(0.26)
TROP	0.14	—	—	—	—	—
	(0.20)					
POLITY	—	—	0.01	—	—	—
			(0.01)			
GAST	—	—	—	−0.03	—	—
				(0.03)		
COH	—	—	—	—	0.10	—
					(0.11)	
POLAR	—	—	—	—	—	**0.25**
						(0.12)
PNUM	−0.01	0.03	−0.01	0.00	0.05	−0.01
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
PDUR	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
χ^2	**14.23**	*9.45*	**12.85**	**12.51**	**13.30**	**15.59**
Log-likelihood	−713.06	−710.13	−708.39	−713.92	−675.82	−653.64
No. of obs.	177	176	177	177	169	165

Note: Standard errors are reported in parentheses. Bold indicates significance at the 5% level; italic indicates significance at the 10% level.

The estimates of the coefficients from this semi-parametric estimation and their impact on the hazard ratios are consistent with some, but not all, of the previous results. An increase in per capita income lowers the time spent in IMF programs. The coefficients on the variables for landlocked countries and primary-good exporters show that these countries have longer spells, but their significance falls as more variables are added. The algebraic signs of the coefficients of the two political regime variables, *POLITY* and *GASTIL*, are consistent with those reported in Table 3 but are no longer significant at the 10% level. The polarization variable, however, continues to be highly significant.

The lower levels of significance may reflect the difference in the specification of the models. The log-logistic model is a proportional odds model, as opposed to a proportional hazard model such as the Cox.[13] Specifying a particular distribution for the hazard model may incorporate more information into the estimation that affects the results.

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 the duration of these spells in a sample of developing economies and the factors that affect their length.

The average spell length was almost three 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. The length of a Fund program spell was not affected by the number or length of previous spells.

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 have longer spells; this finding is consistent with the hypothesis that they have not established a manufacturing base. Governments that are polarized along ideological lines end program spells more quickly, most probably due to incomplete implementation of the program. Finally, there is some evidence that democratic regimes spend less time in Fund programs, which is consistent with the results from other studies that they are more successful in implementing the conditions associated with programs.

The IMF's recent emphasis on a country's "ownership" of a program depends in part on adapting stabilization and reform policies to a country's economic, political, and social environment. The IMF's "Guidelines on Conditionality" (IMF, 2002b) state that "...the Fund will pay due regard to the domestic social and political objectives, the economic priorities, and the circumstances of members, including the causes of their balance of payments problems and their administrative capacity to implement reforms."[14] The results of this paper indicate that countries that use the Fund's resources on a continuing basis have characteristics that can be addressed.

Appendix

The countries in the sample are: Algeria, Argentina, Bangladesh, Bolivia, Brazil, Bulgaria, Burkina Faso, Cameroon, Chile, Democratic Republic of the Congo, Costa Rica, Côte D'Ivoire, Dominican Republic, Honduras, Hungary, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, Haiti, Honduras, India, Indonesia, Jamaica, Jordan, Kenya, Madagascar, Malawi, Mali, Mexico, Morocco, Mozambique, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Poland, Senegal, Sierra Leone, South Africa, Sri Lanka, Tanzania, Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, Uruguay, Venezuela, Zambia, and Zimbabwe.

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

COH   *Database of Political Institutions*, World Bank
GAST   Freedom House, *Freedom in the World*, various issues
LAND   *Global Development Network Growth Database*
OPEN   *Global Development Network Growth Database*
PDUR   Length of previous duration, if applicable
PNUM   Number of previous spells
POLAR   *Database of Political Institutions*, World Bank
POLITY   Polity IV Project
PRIX   *Global Development Network Growth Database*
TROP   *Global Development Network Growth Database*
YCAP   *Penn World Table* (Mark 5.6), updated by the World Bank

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Notes

1. See *IMF Survey*, 14 August 2000.
2. See Haque and Khan (1998) and Bird (2001) for surveys of the studies on the effectiveness of Fund-supported policies.
3. See James (1996) for the historical origins of Fund programs.
4. See Polak (1991) on the changes over time in the IMF's objectives and policies.
5. The IMF announced in November 2003 that the CCL, which had never been used, would be allowed to expire.
6. Mussa and Savastano (2000, p. 94).
7. International Financial Institution Advisory Commission (2000, p. 28–9).
8. See Kiefer (1988) for a survey of this class of models.

9. The IMF's lending facilities share many objectives, and the conditionality provisions also have similarities. Many poorer countries utilize both concessionary and nonconcessionary programs. Conway (2003), Knight and Santaella (1997), and Vreeland (2003) did not differentiate between the types of arrangements in their empirical analyses.

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

11. See Beck et al. (2001) for a description of this dataset.

12. The two regime variables were not included as they had only been significant at the 10% level.

13. See Royston (2001) on the differences in hazard models.

14. Decision No. I—Guidelines on Conditionality, A. 4.