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10 The survival of political leaders and IMF programs

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The primary motive of political leaders is to keep their jobs. The policies that best fulfill these goals depend upon the institutional context in which leaders serve. What constitutes effective public policy under one set of institutions constitutes political suicide under other institutions. With this in mind it is hardly surprising that the reasons that leaders turn to the IMF and their behavior under these programs also depends upon the institutional context. In this study we examine how IMF agreements affect the survival of leaders, and how this survival depends upon both domestic political institutions and the context under which leaders seek IMF programs.

1 Background

Why do governments enter into IMF arrangements? The conventional understanding posits that governments turn to the IMF for a straightforward reason: they need a loan of foreign exchange. Indeed, according to the IMF Articles of Agreement, "A member shall be entitled to purchase the currencies of other members from the Fund ... [provided] the member represents that it has a need ... because of its balance of payments or its reserve position or developments in its reserves" (IMF Articles of Agreement Article V, Section 3). Perhaps because it seemed obvious why governments would turn to the IMF, early on this question was ignored in the literature evaluating IMF programs (e.g., Reichmann and Stillson 1978; Connors 1979; Gylfason 1987).

Initial efforts to address the question, however, revealed that the answer was anything but straightforward. While Santaella (1996) and Goldstein and Montiel (1986) found that countries were more likely to turn to the IMF when the balance of payments deficit increased, Knight and Santaella (1997), Conway (1994), and Edwards and Santaella (1993) did not find that the balance of payments mattered. A consensus did emerge around other economic factors, such as level of foreign reserves and level of development (reported in Bird 1996), but economic factors appeared to tell only part of the story.

A political story seemed plausible. Putnam (1988: 457), following Spaventa (1983), argued that IMF arrangements "sometimes enable government leaders to do what they privately wish to do, but are powerless to do domestically . . . this pattern characterizes many stabilization programs that are (misleadingly) said to be 'imposed' by the IMF." Others also developed this theme. Vaubel (1986: 45) claimed that the IMF enables politicians "to shirk domestic responsibility for unpopular policies." Remmer (1986: 7, 21) contended that the presence of the IMF "allows authorities to attempt to shift blame for austerity to the Fund." Edwards and Santaella (1993: 425) argued that governments facing domestic opposition to devaluation get the IMF to do their "dirty work." Dixit (1996: 86) noted that developing countries use the IMF as a "delegate" to impose fiscal and monetary restraint.

These arguments suggest two political motivations for entering IMF agreements: "leveraging," where governments use the IMF to increase bargaining leverage with domestic actors opposed to economic reform,[1] and "scapegoating," where governments use the IMF to escape the blame for economic austerity. In contrast to the conventional need-based story where governments turn to the IMF because they *need* a loan, this suggests that there are political *discretionary* motives for governments to turn to the IMF.

While these political arguments have floated around the literature for decades, they have only recently received systematic attention. Various mechanisms have been proposed. Drazen (2005) argues that reform-oriented executives use the IMF loan as a carrot to get opponents of reform to accept IMF conditions. Vreeland (2000, 2003) argues that reform-oriented executives use the IMF threat of punishment as a stick to get opponents of reform to accept IMF conditions. Ramcharan (2003) suggests that governments sign IMF agreements to signal the credibility of their resolve to push economic reform past opponents. All of this work has considered the implications of discretionary motives to turn to the IMF for policy change. In our study, however, we focus on the implications for leadership survival.

Previous studies related to leadership survival have considered how elections play a role. Dreher (2002, 2003a) shows that governments are not likely to enter into IMF agreements within six months before elections, and Przeworski and Vreeland (2000) show that governments are more likely to enter into IMF programs after elections are over. Yet Nelson (1992) and Killick (1995) report that the governments that actually do sign IMF agreements before elections are more likely to be reelected. Dreher (2003b) addresses this puzzle. He argues that entering into an IMF program can send a negative signal of government competence, but only in certain situations. If economic conditions are the result of government competence and random economic shocks, even highly competent governments turn to the IMF when hit by a bad enough shock.

If the economic situation is such that both competent and incompetent governments need a loan from the IMF, incompetent governments can masquerade as the competent type, and both types are reelected despite signing an IMF agreement. When the economic crisis is less severe, competent governments can get sufficient financing from sources other than the IMF, but incompetent governments have only the IMF as a source of funding and must enter into an IMF agreement. So, when the economy is in moderate shape, only incompetent governments sign IMF agreements, and they are not reelected. Dreher's empirical evidence supports his claims. He finds that while there are fewer IMF programs concluded before elections, governments are more likely to be reelected if they do sign an IMF agreement before elections, but less likely to be reelected if they sign the agreement and the economy is in good shape (if growth is high). This is an important counterintuitive result. Note, however, that Dreher addresses the effect of IMF agreements on reelection, not survival in general. The hazards faced by leaders in developing countries are many, and elections tell only part of the story. Furthermore, the hazards facing leaders vary over their tenure according to the institutional context (Bueno de Mesquita *et al.* 2003). It is therefore important to account for duration dependence. Also, Dreher's argument returns to the conventional need-based story of IMF participation: governments turn to the IMF for a loan. There is no scapegoating – governments are reelected despite signing an IMF agreement only if they are perceived as competent. But as our discussion above illustrates, discretionary motives play a role.

In our work below, we emphasize the two competing motives that political leaders have to turn to the IMF: *need* and *discretion*. Clearly some governments turn to the IMF because they sorely need a loan to help their financial difficulties. Yet, as our discussion of leverage and scapegoating points out, leaders often use the IMF for reasons other than financial need. Whether a leader's motivations are need-based or discretionary has implications for performance under IMF programs. In this chapter we examine how IMF programs affect leader survival, and show how this effect depends on the contingencies under which leaders initiate programs, as well as the domestic political institutions they face.

2 Institutions, policy choice, and the survival of leaders

Leaders want to keep their jobs. The ease with which they can do so and how they go about doing so depends on the institutional context in which they serve. We utilize Bueno de Mesquita *et al.*'s (2003) and Bueno de Mesquita *et al.*'s (1999, 2002 – hereafter BdM2S2), concept of selectorate and winning coalition size to characterize domestic political institutions. They analyze how the size of the selectorate and winning coalition shape the policy priorities of leaders and the ability of leaders to retain office.

The selectorate, S, is the set of people with a say about who can be

leader. For instance, in democratic societies the selectorate is typically all citizens, while in other societies the selectorate can be a small group. In monarchies the choice of king resides with the aristocracy, and in military juntas senior military officers choose the leader. The most important quality of the selectorate is that it constitutes the pool of potential supporters from which leaders and potential leaders draw supporters to form a winning coalition.

The winning coalition, W, is the set of supporters a leader requires in order to retain power. In democracies, the winning coalition is a large proportion of a large selectorate. In other systems, such as elected monarchies, W might also be a majority of S, but with W obviously being much smaller. Leaders in autocracies often only require a small number of supporters to retain power (small W). Unlike categorical classifications of regimes, such as democracy and autocracy, W and S are conceptually continuous variables that allow not only for comparison between nominal groups, but also for comparison within groups. For instance, the winning coalition for a directly elected president is half the selectorate. In contrast, the winning coalition for leader requiring a majority of single-member electoral districts in a two-party system, such as the Westminster system, is a quarter of the selectorate.

Institutions shape the policies leaders pursue. Many policies improve the welfare of all members of society, be they members of a leader's coalition or not. In contrast, other policies, such as trade protection and patronage, reward the few. BdM2S2 distinguish between these policies as "public" and "private" goods. Of course in reality there are few pure public or pure private goods. However, institutions – specifically coalition size – determine the focus leaders have between these goals.

When a leader is beholden to a small coalition she can reward her supporters through private goods. As the coalition size increases so that rewards need to be given to more people, the focus of policy shifts toward public goods. The types of policies governments pursue thus depend on the institutions under which leaders serve.

Coalition size (W) and its interaction with selectorate size (S) influence how leaders survive in office. When supporters of the incumbent leader contemplate defection to support a challenger, they consider the potential costs of supporting the new leader. Although a supporter might have been critical in bringing a new leader into office, once ensconced the new leader is free to reorganize his coalition. When supporters defect, they risk being excluded from future coalitions. This risk is increasing in the size of the pool of potential supporters (S) and decreasing in the number of supporters a leader needs (W). The cost of exclusion is decreasing in W. Hence when W is small (and particularly when S is large) supporters of the incumbent are particularly reluctant to defect because while the incumbent's inclusion of them in the current coalition demonstrates they will be included in future coalitions, challengers can only offer them

inclusion in future coalitions probabilistically (W/S). Small coalitions make it easier to survive in office, and conditional upon a small coalition, large selectorates increase tenure in office.

Leaders of small coalition systems survive by providing private goods. This focus on private goods induces a "loyalty norm." Once supporters are assured of their place in future coalitions they are intensely loyal to the incumbent, since a challenger cannot offer them guaranteed access to future private goods. This suggests an important dynamic in the survival of leaders. In large coalition systems, leaders are always in jeopardy since survival depends upon the provision of good public policy and the competition for ideas is intense. In contrast, survival in small W systems depends on the provision of private goods. Once an autocrat is established, her supporters can be fairly certain of future inclusion in the coalition. This is not so during the initial transition period. Although a leader might have relied on a coalition to come to power, once in power she wants to replace its members with those selectors that for idiosyncratic reasons she believes will be more loyal or for whom she has greater affinity. Members of the current leader's coalition who suspect they will be dumped in the future are particularly keen to defect to a challenger. Hence, recently installed autocrats find survival extremely difficult, but once established their tenure in office becomes secure. As BdM2S2 observe, and we shall replicate here, the risk of deposition for large coalition leaders always remains high, but for small coalition leaders risk starts high and declines rapidly.[2]

BdM2S2's theory provides a basis from which to examine policy choice and leader survival. Leaders from large coalition systems pursue public goods, while the provision of private goods is the key to survival in small coalition systems. Although leaders in both systems like economic success, small coalition leaders do not follow policies likely to promote economic success at the expense of paying off their supporters.

Having established a basis for the policy choices of leaders and their survival prospects under different regimes we have a platform from which to explore the decision to go to the IMF and the consequences of doing so.

3 Competing reasons to enter IMF agreements

Leaders have different motives to turn to the IMF, as we discussed above. We dichotomize these reasons into *need-based* and *discretion*.

Needing a loan is perhaps the easiest category to describe, as it is the stated purpose of IMF arrangements. When a government faces a BOP, reserves or currency crisis it turns to the Fund for a loan. While IMF loans are typically small, they may have a catalytic effect on financing (Bird and Rowlands 2000; Edwards 2000) and may be necessary to enter into debt rescheduling negotiations (Callaghy 1997, 2002). Many private lenders use the IMF's willingness to lend as a signal as to whether they should

extend credit. The presence of the IMF has also been shown to increase the value of assets that are privatized (Brune *et al.* 2003).

Apart from needing a loan, a leader may enter into an IMF program for discretionary reasons. The IMF attaches conditions to its loans. While this conditionality limits a government's policy discretion, this is often beneficial for leaders attempting to implement reforms that some domestic actors would like to block. By accepting conditionality, leaders can raise the cost for others of scuttling their reform package. The IMF can also make a convenient scapegoat. Rather than accepting responsibility for domestic policy failures, leaders may dilute accountability by blaming IMF conditionality for problems.

So leaders might turn to the IMF because they need a loan, because they have some discretionary desire for conditionality, or for some combination of need and discretion. The circumstances under which these motives are likely to arise, as well as the impact of the IMF agreement itself, depend on the political institutions under which leaders serve. We now examine conditions that induce leaders to seek IMF agreements under each scenario and the consequences of such agreements.

3.1 Need-based IMF programs

Countries facing high debt service, poor balance of payments, low and/or declining reserves, large budget deficits, and who have experienced a recent currency crisis are likely to need an IMF agreement to help stabilize their international financial position. Such a situation may be indicative of policy failure. Democrats, who are dependent upon large coalitions and who are hence sensitive to policy failures, should be particularly attracted to IMF agreements to help solve their problems. Not only does the IMF program provide a loan but also a convenient scapegoat for the economic pain that economic reforms may bring. Unfortunately for them, IMF agreements under such circumstances cut two ways. While agreements may help improve economic fundamentals and provide a needed loan, they are also indicative of policy failure in the first place. That a democrat needs to enter an agreement under such circumstances is a bad sign, but this is offset by the extent to which an IMF agreement may help. Thus we predict that being under a need-based loan agreement is generally good for the survival of large coalition leaders, but needing such a loan in the first place is bad. Which effect dominates is an empirical question. Fortunately, we can distinguish between the benefit and the signal of prior failure in our subsequent tests, since in many cases leadership changes while countries are under IMF programs. A leader installed while under an IMF program is advantaged by the loan, the possible policy benefits of IMF programs, and the scapegoat for the pain of reform without suffering the stigma of prior policy failure.

The situation for small coalition leaders is more complex. Remember

that their survival is not linked directly to public policy successes but rather to the ability to pay off their supporters with private goods. Economic failure harms autocrats' tenure only to the extent that it limits their ability to reward supporters. In general, small coalition leaders face mixed incentives. On the one hand, they value loans as they provide another source of income to expropriate. On the other hand, these loans come with conditions that may constrain a small coalition leader's ability to spread patronage. So, for small coalition leaders, entering into a loan program is a mixed blessing. It increases access to funds but pushes policy toward "public" rather than the politically expedient private orientation. Again we are fortunate in that our econometric tests allow us to distinguish between these effects. While leaders who sign IMF programs have to contend with IMF conditionality, they are also well positioned to ensure their supporters gain from the loan. In contrast, when leadership changes during an IMF program, the new leader, while still saddled with IMF conditionality, finds it harder to redirect funds as she struggles to establish her rule and reorganize her winning coalition. Small coalition leaders who inherit IMF programs from their predecessors find survival harder than corresponding leaders who sign IMF agreements.

3.2 Discretionary loan

IMF agreements come with conditions, and these can often be useful in overcoming veto players (Tsebelis 1995, 2002) who wish to block reforms. So, despite having no pressing financial need for a loan, political leaders can find IMF programs useful for political purposes. Large coalition leaders, in particular, want to improve policy. Doing so helps their survival. When large coalition leaders enter into an IMF agreement but economic conditions such as the BOP and reserves do not warrant it, we should suspect a discretionary motive. Loans made under such discretionary conditions should correlate with political survival. The mechanism is twofold. The first is a selection argument. Large coalition leaders who do not need a loan would be unlikely to enter an agreement if such an agreement would cost them their job. Second, conditionality allows them to implement their desired reforms, which may improve the quality of public policy. Hence, we predict that when large coalition leaders enter into IMF agreements without any pressing need to do so we should expect the agreement to help their survival.

Discretionary IMF loans affect the survival of small coalition leaders quite differently – they are likely to harm the survival of small coalition leaders. While IMF programs help leaders implement policy reform, autocrats pursuing policy reform are not undertaking those policies most beneficial to their survival. Autocrats might still sign discretionary loans for their scapegoating properties; however, small coalition leaders in need of a scapegoat are already in serious trouble and likely to be deposed,

especially when IMF conditions limit their ability to spread patronage to their supporters after the initial tranche of the loan has been spent.

3.3 Data

This project is data intensive and requires data from various sources. In particular we require data on political leaders, political institutions, the timing of IMF agreements, and economic conditions. The data on political leaders and institutions are taken from BdM2S2 (2003). Their study describes the date political leaders enter and leave office. It also provides a measure of winning coalition (W) and selectorate (S) size. These variables are measured on a five and a three point scale, respectively, and are both scaled between zero and one. Since the impact of selectorate size is only really important in small W systems, we construct the variable "effective S," $eS = (1 - W)S$. We hypothesize when this variable is large, i.e., in a small W, large S system, that political survival is easier than when winning coalitions are large or when the selectorate is small.

The data on IMF agreements are taken from IMF Annual Reports (various issues). We look at IMF programs only from 1960 onwards. Data on economic conditions are taken primarily from the World Bank Development Indicators (2002) CD-ROM and the IMF's International Financial Statistics (2003) CD-ROM. Table 10.1 lists the major variables used and the data source.

Our primary question is how IMF programs affect the survival of leaders. To address this problem we need to know when governments enter into IMF agreements, when they leave IMF agreements and the dates of leader entry and exit. Figure 10.1 shows the basic setup of the data for Britain during the later half of the 1970s. The figure starts in 1975 at which time Harold Wilson was Prime Minister. He resigned and was replaced by James Callaghan on April 5, 1976. Margaret Thatcher became Prime Minister on May 4, 1979. Britain entered into two separate IMF agreements during this time. The first was entered into by Wilson on December 31, 1975 and it expired during Callaghan's term on December 30, 1976. Callaghan rapidly reentered an agreement on January 3, 1977 and this agreement continued until January 2, 1979.

Figure 10.1 shows how we code whether a leader is under an IMF agreement. The line marked by circles shows whether a leader is UNDER any IMF agreement. This variable is coded one between 12/31/1975 and 12/30/1976 and between 1/3/1977 and 1/2/1979. Since leaders might inherit IMF agreements from their predecessors rather than enter into them themselves we create an alternative dummy variable, Signed, which indicates whether or not a leader is under an IMF agreement that he or she actually signed. For clarity of presentation this dummy variable is plotted at 0.5 in Figure 10.1, but it is actually coded 0/1 in the data. Although James Callaghan is coded as UNDER an IMF agreement in the

Table 10.1 Summary of key variables

Variable	*Definition*	*Source/format*
UNDER	Country is under an IMF agreement during period	IMF Annual Reports
Signed	Leader is under an IMF agreement that she signed Obviously signed implies UNDER, but the contrary is not true	IMF Annual Reports
signX	The value of the variable X at the time a leader signed an agreement (or renewed an agreement); zero if signed = 0	
W	Winning coalition size: (BdM2S2 2003) scale: 0–1. W = 0 are small exclusionary regimes such as juntas, monarchies and some autocracies. W = 1 are large inclusionary systems, such as Democracies	BdM2S2, annual data
eS	Effective selectorate size = S(1 − W) where S is the size of the selectorate (the size of the pool from which W is chosen). Scale: 0–1, see BdM2S2 (2003)	BdM2S2, annual data
Growth	Annual rate of growth: WDI in constant 1995 $	WDI, annual data
DebtService	Debt Service: % of GNP	WDI, annual data
ΔExchange	Largest monthly devaluation in either current or previous two months	IFS, monthly data
ΔReserve	Change in total reserves: smallest change (i.e. largest decline) over current or two previous months	IFS, monthly data
Reserves/ imports	Ln(1 + reserves/imports): reserves/imports the number of months of imports that can be paid for by total reserves	IFS, quarterly data
Year	Calendar year – 1975	Annual data
Cumulative agreements	Ln(1 + cumulative agreements signed by country)	IMF Annual Reports
P	Predicted probability that IMF program is discretionary: $P = \Phi(X_{1t}\hat{\beta}_1)/(\Phi(X_{1t}\hat{\beta}_1) + \Phi(X_{2t}\hat{\beta}_2))$	Predicted from Model 5
NEED[a]	Index of financial need for an IMF loan	IFS and WDBI

Note

a NEED is a composite index of the financial need for an IMF loan. It is constructed as follows: First set NEED = 0 then add points according to the following rules. A) Add one if total reserves decline by more than 10 percent (in current or either of two previous months). B) Add one if reserves decline by more than 30 percent. C) Add one if reserves are less than two months of imports (quarterly IFS data). D) Add one if reserves are less than one month of imports. E) Add one if currency exchange rate increases (devaluation) by more than 2 percent in the current or either of the preceding months. F) Add one if currency exchange rate increases by more than 10 percent in the current or either of the two preceding months. G) Add one if inflation rate increases by more than 20 percent (quarterly IFS data). H) Add one if inflation rate greater than 15 percent. I) Add one if inflation rate is over 50 percent. J) Add one if BOP divided by GDP (quarterly BOP and annual GDP data from IFS and WDI respectively) is less than −0.005 (i.e. 0.5 percent imbalance). K) Add one if BOP divided by GDP (quarterly BOP and annual GDP data from IFS and WDI respectively) is less than −0.04 (i.e. 4 percent imbalance). L) Add one if foreign debt (in terms of GDP) is more than 50 percent. M) Add one if foreign debt (in terms of GDP) is more than 100 percent.

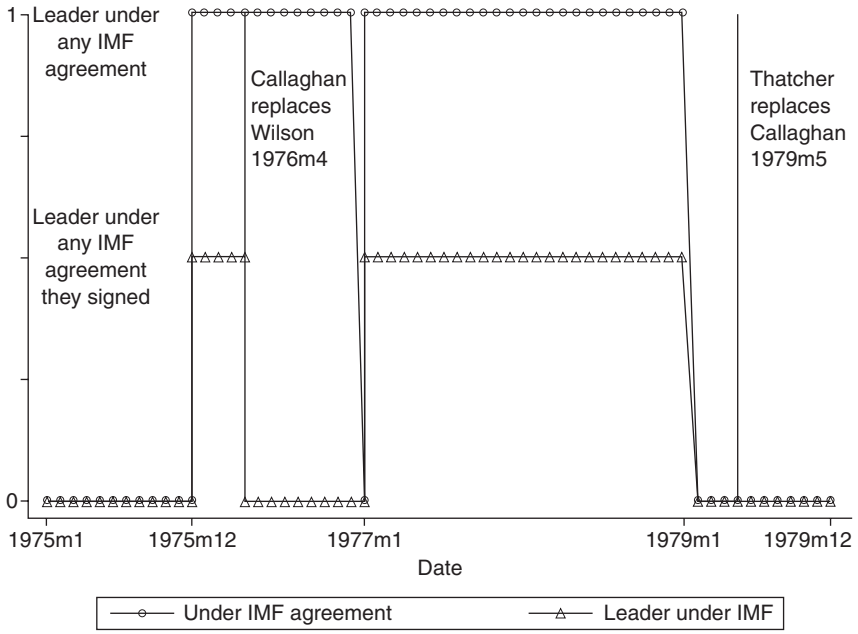

Figure 10.1 British leadership changes and IMF agreements during the 1970s.

first part of his term, he is not coded as having Signed because he inherited the IMF agreement rather than signed it himself. While Signed = 1 implies UNDER = 1, the reverse is not necessarily true.

Our conceptual framework argues that the context in which loans are undertaken influences the subsequent impact of agreements. Thus, we create versions of many of our variables that record the value of the variable at the time a leader enters an agreement. If, for instance, we consider variable X, then the variable signX is coded as the value of variable X at the time the IMF agreement was signed for as long as the country remains under the IMF program and the leader remains in office. For those periods when no IMF agreement is in place, or when the leader inherited the IMF program rather than signed it herself the variable signX takes value zero.[3]

For our hazard analysis, we use Weibull regression, a parametric hazard model. In particular, the Weibull model assumes the hazard rate, the probability of deposition conditional upon not having already been deposed, is $h(t) = p*\exp(X\beta)*t^{(p-1)}$, where $X\beta$ represents the standard vectors of covariates and parameter coefficients, t is time in years, and p is an ancillary parameter that describes the overall shape of the hazard function (which can be increasing, decreasing, or constant). The theory and prior analyses (BdM2S2 2003) suggest that while the hazard remains relat-

ively constant for large coalition leaders, the risk of deposition that small coalition leaders face declines rapidly over time. To capture this, we model the ancillary parameter p as a function of coalition size (W).

4 Results

When we control for domestic political institutions and the contingent circumstances that motivated the agreement, IMF programs have clear impacts on survival. To appreciate the impact of IMF programs we need to first accurately describe survival prospects. In Table 10.2 we examine a baseline model of leader survival. It is against this backdrop that we examine the impact of IMF agreements.

4.1 Baseline survival

Model 1 provides a baseline assessment of the effects of institutions on leader survival. Model 1 is a Weibull model in which we control for winning coalition size (W), selectorate size (eS) and economic growth. Additionally, we model the ancillary Weibull parameter, p, as a function of W.

Winning coalition and selectorate sizes strongly influence survival. The ancillary parameter p is increasing in W. The estimates of p in small and large coalitions are 0.706 and 0.946, respectively. Since we find $p < 1$, the overall hazard function is decreasing over time. This implies that all leaders find it easier to survive in office as their tenure increases. However, the risk declines faster for small coalition leaders than for large coalition leaders, who always face significant risk to their tenure. Consistent with theoretical arguments and earlier empirical findings (BdM2S2 2003) this implies that survival for leaders in large coalition systems remains hard, while for small coalition systems, political survival becomes increasingly easy over time. For autocrats, the difficulty is staying in office over the first few years. Once this is achieved, they find continued tenure relatively easy. In contrast, the incumbency advantage of leaders in large W systems does not grow as rapidly. This is most easily seen graphically. Figure 10.2 plots the hazard rate for large ($W = 1$) and small ($W = 0$) coalition systems (evaluated at $eS = 0$ and a growth rate of zero). The figure indicates that while it is initially harder for autocrats to survive in office (the negative coefficient of -0.463 for W in the $X\beta$ component of the hazard rate), as affinities are revealed, and hence supporters become more certain of being retained in future coalitions, the loyalty norm increases and the threat of removal decreases. The negative coefficient of -1.497 for the effective S variable (eS) means that survival is particularly easy in large selectorate, small coalition systems. For the small coalition systems ($W = 0$) moving from a small ($S = 0$) to a large selectorate ($S = 1$) reduces the risk of deposition by 78 percent.

Table 10.2 The impact of institutions and IMF agreements on the survival of leaders: Weibull survival analysis with the ancillary parameter modeled

	Model 1 coefficient (standard error)	*Model 2 coefficient (standard error)*	*Model 3 coefficient (standard error)*
W	−0.463* (0.217)	−0.477* (0.214)	−0.308 (0.238)
eS	−1.497** (0.252)	−1.468** (0.245)	−1.444** (0.244)
Growth	−0.046** (0.007)	−0.046** (0.007)	−0.046** (0.007)
Growth*W	0.015 (0.014)	0.014 (0.014)	0.014 (0.014)
UNDER		−0.115 (0.092)	0.382* (0.214)
UNDER*W			−0.845* (0.380)
LEADER_UNDER			−0.275 (0.334)
LEADER_UNDER *W			0.479 (0.520)
Constant	−0.719** (0.140)	−0.688** (0.142)	−0.814** (0.161)
Ln(p)			
W	0.292** (0.111)	0.295** (0.111)	0.262* (0.116)
Constant	−0.348** (0.083)	−0.350** (0.082)	−0.326** (0.087)
Leaders	1066	1066	1066
Observation (monthly)	59245	59245	59245
LogLikelihood	−1555.60	−1554.72	−1552.25

Notes
Standard error in parentheses.
* $p<0.05$, ** $p<0.01$ (one tailed tests).

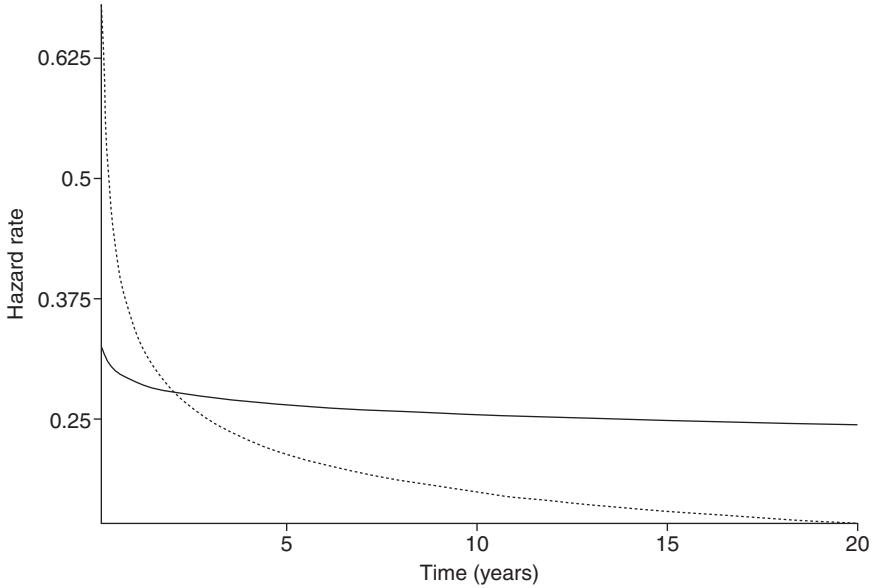

Figure 10.2 Hazard rate over time for large and small coalition systems (solid line: W = 1, dotted line: W = 0; time in years).

High economic growth improves survival in all political systems. The coefficient of −0.046 on the economic growth variable translates to a hazard ratio of 0.995, meaning that a 1 percent improvement in economic growth reduces the risk of deposition by 4.5 percent. Although the coefficient on the interaction of W and growth is positive, the effect of growth on survival is statistically indistinguishable from its effect in small coalition systems. Political institutions and economic growth shape the survival prospects of political leaders. We now turn to the impact of IMF agreements on the survival of leaders.

4.2 IMF agreements and leader survival

Model 2 assesses the aggregate effect of being under an IMF agreement. The variable UNDER is coded one if a leader is under an IMF agreement and zero otherwise. The coefficient on UNDER is −0.115, indicating IMF programs reduce the hazard to leader survival by 11 percent (the corresponding hazard ratio is 0.89). This might be evidence of successful scapegoating – controlling for political institutions and growth, participating in an IMF program reduces the risk of deposition for leaders – however, the effect is statistically insignificant.

We conjectured above that IMF agreements have different impacts

under different institutional arrangements. It also matters whether the current leader chose to enter an IMF agreement or whether they inherited such a program from their predecessor. Model 3 examines these differences. The variable Signed is coded one if an IMF program is in effect and the current leader entered the agreement (and coded zero otherwise). Recall that UNDER records only whether a country is under an agreement and does not control for whether or not the incumbent chose to enter the program. As predicted, leader survival depends upon both the institutional context and whether the current leader chose to enter the agreement. Although the coefficients on the Signed variables are statistically insignificant, we examine them in detail here for several reasons. First, joint hypothesis tests suggest that the set of coefficients relating IMF programs are jointly significant. Second, the pattern observed in Model 3 is repeated throughout subsequent analyses (where they are of greater statistical significance).

The coefficient on UNDER is positive, indicating that IMF programs increase the risk of deposition that small coalition leaders face. However, the coefficient on Signed is negative, which indicates that while IMF programs increase the risk of deposition, being the leader that actually signs the agreement largely mitigates the risk. Table 10.3 calculates how the risk of deposition changes relative to not being under an IMF program and how this depends upon coalition size and Signed. Small coalition leaders who sign IMF agreements experience a modest increase in their risk of deposition, 11 percent. In contrast, small coalition leaders who inherit IMF programs but do not initiate them face a much greater increase in risk to tenure of 47 percent.

The effects of IMF programs for large coalition leaders are reversed. The negative coefficient on UNDER*W indicates that IMF programs help large coalition leaders survive. The positive coefficient on Signed*W suggests that being a large coalition leader who signed an IMF agreement reduces the beneficial effect of the IMF program. Calculating the net impact of IMF programs for large coalition leaders requires consideration of all four coefficients. Table 10.3 shows that being under an IMF

Table 10.3 The relative hazard of IMF agreements. The table shows how the hazard ratio of being under an IMF agreement (relative to being under no agreement) depends upon coalition size and whether the leader entered the agreement

Hazard ratio of IMF agreement	*Small coalition (W = 0)*	*Large coalition (W = 1)*
Leader entered agreement (Signed = 1)	11% **increase** in the risk of deposition	23% **decrease** in the risk of deposition
Leader did not enter agreement (Signed = 0)	47% **increase** in risk of deposition	33% **decrease** in the risk of deposition

program, on average, helps large coalition leaders, reducing the hazard by 33 percent. However, being the leader who signs the letter of intent diminishes the value of IMF programs: the reduction in the hazard rate is 23 percent.

Domestic institutions alter the impact of IMF agreements on the survival of leaders: IMF programs hurt the survival of small coalition leaders and help the survival of large coalition leaders. IMF programs hurt survival most when small coalition leaders inherit programs, and they help survival the most when large coalition leaders inherit them.

4.3 Assessing the motivations for loans

Leaders enter into IMF programs for a variety of reasons. Our theory suggests the survival consequences of being under an agreement differ according to the motivations for the loan. Hence, in order to proceed we need to be able to assess the extent to which a loan is *discretionary* or *need-based*. In this section, we follow Gordon and Smith's (2004) methodology to estimate the probability that an IMF program is discretionary rather than need-based. The model is described in detail in the Appendix.

Gordon and Smith (2004) propose using qualitative data to assign causal mechanisms for a limited subset of the data, a model they refer to as "trubit." While in general we cannot tell why a country entered an IMF program, in selected cases we can bring additional case study evidence to bear, which resolves the ambiguity. For instance, Vreeland (2002, 2003) discusses why Uruguay repeatedly entered IMF agreements despite extremely healthy foreign reserves. IMF programs helped Uruguay's leaders enact policy reform. This is clearly a case of discretion. Through the use of Monte Carlo testing, Gordon and Smith (2004) show that by assigning even a small percentage of events as discernible causes radically improves the reliability of estimates.

We rely on Vreeland (2002, 2003) to specify other definitive cases. Of 575 entry decisions in our data we assign 3 as discernible cases of discretion (mechanism 1) and 16 as discernible cases of need (mechanism 2). Due to missing data, in the analysis reported below there are 226 decisions to go under IMF programs of which 1 and 5 cases are assigned to discretion and need, respectively.[4] There is a strong tradeoff in assigning cause. Collecting qualitative information to assign cases is costly. As we become less certain about particular cases, we risk biasing our results by erroneously assigning cause. On the other hand, increasing the number of assigned cases improves the reliability of the estimator (see Gordon and Smith 2004). Here, we adopt a minimalist approach, assigning only a limited number of cases we are certain of. More grandiose assignments of definitive cause are shown in Model 5 and lead to similar substantive conclusions.

Table 10.4 shows MLE estimates of the trubit model. The first equation

Table 10.4 Trubit estimate of the determinants of discretionary and need-based loans

	Model 4: six cases defined as discernible causes based on Vreeland (2002, 2003)	*Model 5: additional cases defined as discernible causes (33 cases of $Y_1 = 1$; 17 cases of $Y_2 = 1$)*[a]
Equation 1: Discretion		
W	−0.472 (0.521)	0.025 (0.374)
Tenure	−0.007 (0.020)	−0.003 (0.014)
Tenure*W	−0.009 (0.037)	−0.007 (0.025)
Year	0.017 (0.014)	0.014 (0.011)
Year*W	0.008 (0.023)	0.0005 (0.0179)
Cumulative agreements	0.113 (0.187)	0.184 (0.150)
Cumulative agreements*W	0.635 (0.616)	0.120 (0.437)
Growth	0.021 (0.018)	0.0125 (0.015)
Growth*W	−0.093** (0.033)	−0.045* (0.027)
Constant	−2.633** (0.299)	−2.601** (0.225)
Equation 2: Need		
W	1.989** (0.795)	2.715** (1.003)
Debt service	0.091** (0.028)	0.102** (0.030)
Debt service*W	−0.055 (0.035)	−0.061 (0.039)
ΔExchange	1.273** (0.350)	1.530** (0.363)
ΔExchange*W	−1.642** (0.480)	−1.970** (0.498)
ΔReserve	−1.121 (0.984)	−1.875 (1.181)
ΔReserve*W	2.459 (1.557)	2.829 (1.806)
Reserves/imports	−0.013 (0.244)	0.096 (0.329)
Reserves/imports*W	−0.749* (0.377)	−1.082* (0.494)
Growth	0.005 (0.020)	0.012 (0.026)
Growth*W	−0.017 (0.033)	−0.056 (0.042)
Constant	−3.235** (0.570)	−3.847** (0.719)
Observations	11799	11799
LogLikelihood	−1037.37	−1057.49

Notes
Standard error in parentheses.
* $p < 0.05$, ** $p < 0.01$ (one tailed tests).
a Additional definitive causes code as $Y_1 = 1$ if NEED = 0 and $Y_2 = 1$ if NEED > 5.

corresponds to discretionary motivations, the second equation relates to need-driven decisions to enter IMF programs.

Vreeland (2003) argues that the "audience" or "sovereignty" costs of entering into IMF agreements decreases when other governments – either historically within the country or governments around the world – also have participated in IMF agreements. Discretionary agreements are likely only when these costs are low. Also, Przeworski and Vreeland (2000) argue that dictatorships (small coalition political systems) are less likely to turn to the IMF for discretionary purposes. Thus, the discretion equation includes the variables W, Tenure, year (measured as the calendar year

minus 1975), the cumulative agreements (measured as the natural logarithm of the total number of that country's prior agreements plus one) and the interactions of the latter variables with W. The results suggest that individually none of these factors significantly increase the likelihood of a discretionary IMF program. However, as a group they are highly statistically significant, with the likelihood of an IMF agreement being highest early in a leader's tenure (especially for large W), when countries have participated in many prior IMF programs and as year increases. The estimates also suggest economic growth increases the likelihood of agreement in small W and reduces it in large W. However, the effect is only statistically significant in large coalition systems. A stalled economy provides the impetus to initiate discretionary IMF programs.

The various literatures on the causes of IMF programs suggest the inclusion of additional variables such as number of veto players, levels of domestic violence and variables corresponding to the electoral cycle. Unfortunately, inclusion of these variables reduces the number of observations, sometimes drastically. Therefore, the results presented here do not attempt to capture these concepts.

The second equation corresponds to need-based causes for loans. It includes the country's debt service, change in exchange rate, change in reserves, level of reserves, growth and each of these variables interacted with W. Both Models 4 and 5 indicate that high levels of debt service increase the likelihood of a need-based IMF loan. The effect is stronger for small coalition systems. However, the result remains significant even for large coalition systems. In small coalition systems devaluation of the national currency increases the probability of a need-based IMF loan. As the exchange rate rises (i.e., the local currency devalues) debts denominated in foreign currencies such as the US dollar effectively increase. Given this, it is surprising that we see the opposite effect in large coalition systems. Devaluation reduces the likelihood of a need-based IMF program (the aggregate impact of the ΔExchange and ΔExchange*W variables is significant at the 2 percent level). This later result is contrary to expectations.

Reserves affect the likelihood of a need-based IMF program. As a country's reserves decline it becomes more likely to enter an IMF program. This of course was one of the ostensible purposes of the IMF. The effect is weak and statistically insignificant for small W, but in large coalitions the impact of reserve levels is strong and highly significant. While the actual level of reserves strongly influences the likelihood of a need-based IMF program, changes in reserve levels have a far weaker impact. Although the coefficients suggest a decline in reserves makes loans more likely in small W systems and less likely in large W systems, the effects are statistically insignificant.[5] Economic growth has no significant impact on the likelihood of need-based IMF loans once financial considerations are controlled.

The estimates in Table 10.4 suggest discretionary loans are most likely when leaders first come to power, when many previous agreements have been signed in the country's past, as the calendar year increases and when economic growth slows in large W systems. Need-based loans occur when countries service high debts and have low reserves. These estimates provide the basis from which to discriminate between the competing motives for a loan. In particular, if a country takes out a loan in the 1960s, having never previously entered an IMF program, when the leader is well established, economic growth is robust but reserves are low and the country is highly indebted then it is likely that such a loan is need-based. More systematically, we can use the results from Model 4 to estimate the relative probability that a loan is discretionary rather than need-based. The probability of entering a discretionary loan at time t is $\Phi(X_{1t}\hat{\beta}_1)$ where $\Phi()$ is the standard normal distribution, X_{1t} is the vector of covariates associated with mechanism 1 and $\hat{\beta}_1$ are the coefficient estimates for Equation 1. The corresponding probability of entering a need-based loan at time t is $\Phi(X_{2t}\hat{\beta}_2)$. Given these estimates, if a government enters into an IMF program at time t then the probability that this loan is discretionary rather than need-based is $P = \Phi(X_{1t}\hat{\beta}_1)/(\Phi(X_{1t}\hat{\beta}_1) + \Phi(X_{2t}\hat{\beta}_2))$ (see the Appendix for details).

Our theory predicts that the effects of IMF programs on leader survival depend upon the motivation to enter the IMF program in the first place. Using P as an estimate of the probability that a loan is discretionary we now test these predictions.

4.4 Motivations for IMF agreements and the survival of political leaders

IMF programs are anticipated to have different effects on leader survival depending upon why the program was undertaken and the institutional context in which leaders serve. The variable P estimates the probability that a loan is discretionary rather than need-based. Using the same naming convention as earlier, the variable signP represents the motivation for the loan at the time the leader entered the loan. It takes this value for as long as the leader remains in power and the country remains under the IMF program. If the country is not under an IMF program, or the incumbent leader inherited the IMF program rather than signed it herself, then signP = 0. Results are presented in Table 10.5

The impact on IMF programs depends upon whether the leader signed the agreement, the motivation for the loan, and the institutional context of the loan. Thus, in addition to the variables included in Model 3, Model 6 contains the variable signP, which measures the extent to which a loan is discretionary, and its interaction with W. Rather than examine the coefficients themselves, we move directly to an interpretation of the substantive effects. Using the results from Model 6, Table 10.6 compares how an IMF

Table 10.5 How the motivations for IMF programs impacts leader survival (estimate of motives based on Model 4)

	Model 6	*Model 7*	*Model 8*
W	0.362	−0.301	−0.317
	(0.368)	(0.658)	(0.441)
eS	−0.995**	−0.988**	−0.998**
	(0.415)	(0.424)	(0.417)
Growth	−0.080**	−0.085**	−0.075**
	(0.027)	(0.028)	(0.029)
Growth*W	0.068**	0.088*	0.069
	(0.040)	(0.043)	(0.046)
UNDER	0.482	0.445	0.460
	(0.368)	(0.367)	(0.377)
UNDER*W	−1.754**	−1.676**	−1.747*
	(0.748)	(0.713)	(0.772)
Leader_UNDER	−1.985**	−1.639*	−2.027**
	(0.763)	(0.785)	(0.734)
Leader_UNDER*W	3.231**	3.062**	3.248**
	(1.086)	(1.136)	(1.043)
signP	2.637**	2.099*	2.739**
	(0.924)	(0.933)	(0.872)
signP*W	−3.388**	−3.451**	−3.453**
	(1.308)	(1.259)	(1.274)
P		0.761	
		(0.628)	
P*W		0.065	
		(0.824)	
NEED			0.062
			(0.097)
NEED*W			−0.019
			(0.145)
Constant	−0.758**	−1.303**	−0.896**
	(0.217)	(0.533)	(0.301)
Ancillary parameter, ln(p)			
W	0.188	0.203	0.191
	(0.269)	(0.262)	(0.268)
Constant	−0.285*	−0.258*	−0.285*
	(0.154)	(0.154)	(0.153)
Observations	18399, 385	18399, 385	18399, 385
LogLikelihood	−455.04	−450.88	−454.25

Notes
Standard error in parentheses.
* $p<0.05$, ** $p<0.01$ (one tailed tests).

program alters the risk of deposition relative to no IMF program for both small and large coalition systems. The top row examines the case where countries are under IMF programs but the incumbent leader inherited rather than signed the agreement (UNDER = 1, Signed = 0, signP = 0). The center row is calculated assuming a loan is known to be discretionary and signed by the incumbent leader (UNDER = 1, Signed = 1, signP = 1). The bottom row examines need-based loans signed by the incumbent (UNDER = 1, Signed = 1, signP = 0).

The top row of Table 10.6 shows the effect of being under IMF programs that the current leader did not sign. Small coalition leaders, who find themselves encumbered by IMF programs that they did not initiate, are more likely to be deposed. The increase in risk is 62 percent (hazard ratio = 1.620), although this is not statistically significant. In contrast, IMF loans improve the survival of large coalition leaders who inherit IMF programs. Specifically, inheriting an IMF program reduces the risk of deposition by 72 percent (hazard ratio = 0.280). This is a statistically significant finding. This may be evidence that scapegoating is the most effective for democrats who inherit programs from their predecessors. It may also be that the economic pain associated with IMF economic reforms occurs when the country first participates in the IMF program.

The center row corresponds to the impact of leaders signing discretionary loans. Such discretionary loans badly damage the survival prospects of small coalition leaders, increasing the risk of deposition by more than threefold. In contrast, need-based loans help small coalition leaders survive, reducing the risk of deposition by 78 percent. Recall that small coalition leaders survive in office by paying off their supporters. These leaders survive by distributing the spoils. To the extent that IMF programs constrain autocrats from such activities, they hurt survival prospects.

Table 10.6 The survival impact of IMF programs controlling for motivation. The table shows how the hazard ratio of signing an IMF agreement (relative to being under no agreement) depends upon coalition size and whether the loan is discretionary or need-based

Hazard ratio of signing IMF agreement	*Small coalition (W = 0)*	*Large coalition (W = 1)*
Inherited loan: UNDER = 1, Signed = 0, signP = 0	62% **increase** in the risk of deposition	72%* **decrease** in the risk of deposition
Discretionary loan: UNDER = 1, Signed = 1, signP = 1	311%* **increase** in the risk of deposition	54%* **decrease** in the risk of deposition
Need-based loan: UNDER = 1, Signed = 1, signP = 0	78%* **decrease** in the risk of deposition	3% **decrease** in the risk of deposition

Note
* $p < 0.05$.

While small coalition leaders are aided by need-based loans and harmed by discretionary loans the opposite pattern is found for large coalition leaders. If a large coalition leader signs an IMF agreement for need-based reasons then the risk of deposition is similar to that the leader faces from not signing an IMF agreement. However, this risk to tenure is considerably higher than if the leader signed an IMF program for discretionary purposes. Under this latter contingency leaders reduce their risk of being deposed by 54 percent. It is useful to remember that large coalition leaders that inherit IMF program fare best of all, reducing their risk of deposition by 72 percent relative to no IMF program.

One reasonable criticism of these results is that they derive as a function of the underlying economic conditions and have little to do with whether an IMF program is need (−) or discretion (2x) based. Models 7 and 8 control for this possibility. Model 7 includes the variable P and its interaction with W. Since P measures the extent to which a loan is discretionary, high P values indicate little need for a loan. Hence Model 7 controls for the underlying need of a loan in each month. Model 8 also controls for economic need through the inclusion of NEED, an index of financial need for a loan. The construction of this index is described in Table 10.1. In neither Model 7 nor Model 8 are these control variables statistically significant; nor do they alter the substantive impact or significance of other variables.

5 Conclusions

The impact of IMF programs depends on domestic political institutions and the context under which IMF agreements are signed. The extant literature suggests governments go under IMF programs for a variety of reasons. Our analyses suggest that the effect of participating in IMF programs depends on what these reasons are. The results are clear: The contingencies under which a leader enters an IMF program and the institutional context in which such a leader serves shape survival.

Democrats that enter into IMF programs generally help their survival prospects. *Inheriting* an IMF program improves survival the most, which may be the result of blaming the previous leader for the IMF program and/or because the economic pain of IMF economic reforms is felt during the earliest years of the program. Entering into *discretionary* IMF programs also helps survival for democrats, perhaps because these discretionary programs are only initiated when IMF economic reforms are expected to improve economic growth and because if the policy changes go awry, the IMF provides a convenient scapegoat. Entering into a *need-based* IMF program has negligible effects for the survival of democratic leaders, probably because the political benefits are mitigated by the fact that the economic situation was poor in the first place.

For autocrats, being under IMF programs hurts survival if the program

is *inherited* or initiated for *discretionary* purposes. We have proposed that this is because the constraints imposed by IMF programs go against the means by which dictatorships survive in office: distributing spoils. IMF programs only help autocrats if they are *need-based*, probably because the initial loan allows them to continue distributing spoils before conditionality constrains them.

To the best of our knowledge this study is the first to explore different motivations for IMF programs through the context of leader survival. Many extensions of this study remain to be pursued. For example, we dichotomized the motivations for loans into two categories: need and discretion. While this is clearly better than lumping all causes for loans into a single mechanism, it still conflates competing mechanisms. For instance, we do not distinguish between discretionary loans for scapegoating and discretionary loans for leverage to push through policy reform. Note that it is not necessary for both political causes to operate. On the one hand, a government could enter into a program purely for political leverage, taking full responsibility for the economic austerity, indeed even advocating it. On the other hand, a government could enter into a program without any belief that IMF conditions will effect positive change, but – expecting bad economic performance – seeks the IMF program for a scapegoat down the road. We suspect that loans undertaken for scapegoating are likely to indicate a leader already in trouble and hence such loans are likely to be followed by deposition. In contrast, discretionary loans undertaken for leverage are more likely to improve tenure, at least in large coalition systems where policy performance matters. Leaders would be unlikely to embark on reform otherwise. The data support this conjecture. As small coalition leaders have little interest in policy reform, efficient public policy not being their *modus operandi*, their discretionary loans are more likely to be for scapegoating than is the case for large coalition leaders. As we saw, discretionary loans drastically reduce the tenure of small coalition leaders but aid the survival of large coalition leaders. Fortunately, the methods outlined in this study can be readily adapted to account for multiple mechanisms, although it requires substantial additional case knowledge to identify cases corresponding to all three mechanisms – need, leverage, and scapegoating.

Throughout this chapter we assume the IMF is always ready to lend. This is not the case. IMF programs are joint agreements between the IMF and a government, as Przeworski and Vreeland (2002) show. Fortunately, the method proposed here could be extended to capture this in a manner similar to Przeworski and Vreeland's (2002) model. As we detail in the Appendix, however, to effectively implement such a model one must first identify key cases of the IMF refusing loans that governments wanted and other cases of governments refusing loans that the IMF offered.[6]

These limitations notwithstanding, as the first large-n study of the effect of IMF programs on leadership survival under all regime types, this

chapter presents interesting results. IMF programs tend to improve the survival prospects of leaders in democracies, while it hurts survival prospects in autocracies. These effects are augmented when the leader inherits an IMF program from a previous leader rather than entering into it himself.

The study also has further implications for the evaluation of IMF program effectiveness in general, a subject that has been studied since the earliest days of IMF arrangements. Our results indicate that the effect of IMF programs depends not just on economic circumstances, but political conditions as well. The motivations of leaders – whether programs are need-based, discretionary, or simply inherited from previous leaders – play a role, as do the political institutions under which leaders serve. Since all IMF arrangements are not the same, these factors should be addressed in the study of the impacts of IMF programs.

Appendix

We assume there are two mechanisms or "causes" by which an IMF program arises: discretion and need. For each mechanism there is an associated latent variable representation: $Y_{1t}^{*} = X_{1t}\beta_1 + \epsilon_{1t}$ and $Y_{2t}^{*} = X_{2t}\beta_2 + \epsilon_{2t}$ where X_{1t} is a vector of independent variables associated with the discretionary mechanism at time t, X_{2t} is a vector of independent variables associated with the need mechanism, β_1 and β_2 are the associated coefficients and ϵ_{1t} and ϵ_{2t} are iid normally distributed stochastic errors with mean zero and variance one. For each mechanism this is a classic probit setup. If the latent variable $Y_{1t}^{*} > 0$ then the government enters into an IMF program for discretionary reasons (if $Y_{1t}^{*} > 0$ then $Y_{1t} = 1$, otherwise $Y_{1t} = 0$). Similarly if $Y_{2t}^{*} > 0$ then the government enters into an IMF program for need reasons (if $Y_{2t}^{*} > 0$ then $Y_{2t} = 1$, otherwise $Y_{2t} = 0$).

If, as analysts, we observed Y_{1t} and Y_{2t} directly then we could estimate each mechanism separately using standard probit models. Unfortunately, all we typically observe is whether a government entered an IMF program or not: if $Y_{1t} = 1$ or $Y_{2t} = 1$ then $Y_t = 1$; if $Y_{1t} = 0$ and $Y_{2t} = 0$ then $Y_t = 0$, where Y_t is a dummy variable indicating whether or not a country enters into an IMF program. Although we do not observe Y_{1t} and Y_{2t} directly, given certain identification restrictions, we can in principle estimate this model (Poirier 1980; Abowd and Farber 1982; Przeworski and Vreeland 2002; Braumoeller 2003). In particular, $\Pr(Y_t = 1) = 1 - (1 - \Phi(X_{1t}\beta_1))(1 - \Phi(X_{2t}\beta_2))$ and $\Pr(Y_t = 0) = (1 - \Phi(X_{1t}\beta_1))(1 - \Phi(X_{2t}\beta_2))$, where $\Phi(\,)$ is the standard normal distribution function; β_1 and β_2 can be estimated by maximum likelihood estimation. Poirier (1980) refers to this as partial observability probit and Braumoeller (2003) calls it Boolean probit. Although Poirier shows that with certain exclusion restrictions the model is technically identified, Gordon and Smith (2004) show, using Monte Carlo studies, that in finite samples this estimator often performs poorly.

Boolean probit estimates are particularly poor when the sample is skewed (few $Y_t = 1$ and many $Y_t = 0$). Since $Y_t = 1$ corresponds to entry into an IMF arrangement, which happens relatively infrequently, these concerns are particularly pertinent here.

The limitation of the Boolean probit estimator stems from two problems, identification and labeling. It is useful to explain these in terms of Przeworski and Vreeland's (2002) related model. In their model they assume, correctly, that IMF agreements require the assent of both the government and the IMF. Analogous to the problem here, they construct a two equation model, one of which refers to the government's decision and the other of which refers to the IMF's decision. In order to identify their model, they need to have at least one variable that is unique to one of the equations. Unfortunately, finding such a variable is not straightforward. They use a country's overall balance of payments (in absolute terms not relative to GDP), contending that it belongs in the IMF decision equation. While they argue that this absolute size of imbalance is important to the IMF, since its job is maintaining global balance, it is hard to imagine BOP imbalances not also influencing governments.

The lack of a strong identifying restriction raises a second problem: labeling. Although the estimator produces estimates for each of the equations, the allocation of each equation to the government and IMF relies upon the relatively arbitrary exclusion restriction. One might tentatively argue that the IMF's estimates belong to the government and vice versa. Przeworski and Vreeland (2002) estimate two decisions: the decision to enter into IMF programs and the decision to continue such programs. While both decisions are clearly pertinent, we examine only the former. Our methodological goal is to estimate the contingent circumstances of IMF programs. In our study, we assume the IMF is willing to make loans. However, this need not be the case. An appropriate solution, for future development, is to model the IMF's decision as a latent variable Y_{IMFt}^* and assume entry into an IMF program requires either ($Y_{1t}^* > 0$ and $Y_{IMFt}^* > 0$) or ($Y_{2t}^* > 0$ and $Y_{IMFt}^* > 0$).

Gordon and Smith get around the labeling problem by assigning a small percentage of events as discernible causes, which also radically improves the reliability of estimates. Gordon and Smith estimate their trubit model using a Bayesian Markov Chain Monte Carlo method. Here we use a maximum likelihood estimation, where the likelihood is $L = 1 - (1 - \Phi(X_{1t}\beta_1))(1 - \Phi(X_{2t}\beta_2))$ if $Y_t = 1$ (and no discernible cause is identified), $L = (1 - \Phi(X_{1t}\beta_1))(1 - \Phi(X_{2t}\beta_2))$ if $Y_t = 0$, $L = \Phi(X_{1t}\beta_1)$ if $Y_{1t} = 1$ (i.e., a discernible case of discretion) and $L = \Phi(X_{2t}\beta_1)$ if $Y_{2t} = 1$ (i.e., a discernible case of need). The MCMC procedure generates similar results. Gordon and Smith (2004) also discuss how to extend the model to deal with probabilistic statements as to discernible causes.

Notes

1 Also called the "tip the balance" story (Bird 2001).
2 Bueno de Mesquita *et al.* (BdM2S2 2002; Bueno de Mesquita *et al.* 2003) formally model the shifting of coalitions through the revelation of affinities.
3 Although not presented here, we examined variables of the form underX, which take the value of variable X at the time a nation enters an IMF program and retains this value for as long as the nation is under the IMF even if the leader changes. When no IMF program is in force underX = 0.
4 In particular Uruguay's agreement in March 1979 is coded a definitive case of discretion, while Côte d'Ivoire's loans in February 1981, August 1984, June 1985 and June 1986 are coded as need-based.
5 One potential explanation for this result is that IMF programs help boost reserves. This produces offsetting effects. Declining reserves increase the likelihood of IMF programs but these programs in return boost reserves. This is an issue that could only be resolved with more detailed data that indicates the precise dates of changes in reserves and the disbursement of IMF loans. We do not yet have these data.
6 Given a latent variable representation for a nation's need, leverage, and scapegoat incentive, and a latent variable representation for the IMF's willingness to lend, the signing of an IMF program ($Y_t = 1$ requires either ($Y_{NEED,t}^* > 0$ and $Y_{IMF,t}^* > 0$) or ($Y_{leverage,t}^* > 0$ and $Y_{IMF,t}^* > 0$) or ($Y_{scapegoat,t}^* > 0$ and $Y_{IMF,t}^* > 0$).

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