

Pick Your Poison: Economic Crises, International Monetary Fund Structural Adjustment and Leader Survival*

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Abstract: Structural loans from international organizations impose large costs on the receiving nation. The decisions to accept such loans and then whether or not to implement the prescribed reforms are made with high stakes in mind. The domestic leader is most likely facing punishment for the current economic crisis, but what is her incentive to implement the arrangements if the costly reforms associated with the loans may reduce her ability to satisfy her supporters? To fully understand this relationship, I develop a theory that explains leader tenure in the post-reform period as a function of the rational decision to accept a loan. Leaders who expect to be secure in the adjustment period are more willing to accept the conditions that accompany loans rather than attempt to withstand the crisis on their own. With the use of a selection duration model, I examine the interplay between electoral incentives and institutional dynamics to show that leaders governing under different institutional arrangements are blamed differently for involvement in structural adjustment loans. Since leaders choose when to accept IMF loans based on their own expectations of post-reform tenure, democratic leaders are less likely to participate in loans. Authoritarian leaders, on the other hand, are more likely to participate in agreements because their hold on power in the post-reform period is stronger.

*I would like to thank Daniel Morey, Robert Walker, and Guy D. Whitten for their helpful comments.

Introduction

When leaders are faced with balance of payments problems and rampant inflation, they often are limited in the range of policy options that they can take. On one hand, they can attempt to handle the economic crisis on their own. The alternative is to approach the International Monetary Fund (IMF) and receive a much-needed boost in foreign reserves to help them weather the storm. However, even if the Structural Adjustment Loans (SALs) help the leader weather the crisis, the difficulties are not over. SALs with stringent austerity programs may constrain the ability for leaders to distribute public goods in the form of government expenditures that are often necessary for the leader to maintain support of his key supporters and stay in power. In this sense, leaders are picking their poison, between economic crisis and costly adjustment.

In this paper I address whether leaders are able to withstand the pressures of IMF adjustment loans differently, based on their regime type. Since the choice to participate in an IMF adjustment loan is a political one in which leaders weigh the costs against the benefits, only politically secure leaders will accept the conditions associated with the loans. I develop a theory that suggests that leaders of different regime types participate in IMF agreements to varying degrees because of the anticipated consequences of those agreements on their post-reform tenure. I find that authoritarian leaders are not only more likely to participate in loans (controlling for economic performance), but they remain in office for longer periods because they have a stronger hold on power in the post-reform period. Leaders from both democracies and authoritarian regimes pick their poison, adjustment or crisis, based on the probability of their survival: authoritarian leaders are more likely to choose adjustment while democratic leaders are more willing to choose crises.

I first examine the effects of economic crises on political stability and the incentives that leaders have to accept IMF SALs. The next section reviews why leaders have the incentive to implement economic reforms even though the reforms are likely to be unpopular and may create short-term economic disturbances. In the theory section, I illustrate why leaders' concerns about maintaining office drive their decisions to participate in IMF loans. I illustrate this by utilizing a Full-

Information Maximum Likelihood (FIML) selection duration model to simultaneously model both the leader's decision to accept a loan and then that loan's effect on leader tenure. I conclude by illustrating the bias that non-random sample selection imposes and by providing the implications for such bias in the study of IMF arrangements on leader survival.

Structural Adjustment Loans and Leader Survival

It is important to recognize that there is both a demand and supply side for the process of doling out adjustment loans (Knight and Santaella 1997). The supply-side variables (the choice of the IMF to supply the loan) and the demand-side variables (the choice of the leader to demand IMF assistance) interact to determine which states get loans and when. The IMF often mandates that a country show its commitment to the costly reforms before it will grant the adjustment loan (Knight and Santaella 1997; Thacker 1999; Przeworski and Vreeland 2000). A country must also illustrate the dire conditions of its economy in order to shore up support for receiving a loan. Any accurate examination of the effects of IMF adjustment loans on leader survival must therefore take the interaction of supply and demand into account.

[Figure 1 about here]

Figure 1 provides the effects of supply- and demand-side variables on the probability of participating in an IMF loan (left side), along with the anticipated effect of domestic, political and economic factors on the survivability of leaders (right side). In this section I focus on the left side of this figure and provide reasons why leaders pursue loans and why the IMF grants loans, even though loans often entail significant costs to leaders and substantial uncertainty.

The decision to enter into an IMF arrangement is a political decision, with commensurate costs and benefits for the leader. The executive is a political actor, who is held accountable for his policies. Debt crises can exacerbate the already-asymmetric power distribution between multi-national

lenders and poor creditors. This limits the range of acceptable policy options for a leader and increases the incentive for accepting an IMF arrangement. Though balance of payment problems have costly effects on political stability, leaders may still be hesitant to pursue Fund agreements because of the political costs of the agreements themselves. Although the costs of the agreements are probable, the benefits from the arrangements are often couched in uncertainty (Bienen and Gersovitz 1985).

What is the incentive to seek IMF adjustment loans if the chances of repairing the economy are relatively slim but the costs are definite and most likely severe? First, leaders may want to enact economic reforms in the pre-adjustment stage, but are unable to do so because of strong opposition groups. Since adjustment loans decrease the amount of government spending, they often entail slashing subsidies and limiting the number of government jobs. Such reforms are likely to be met with strong opposition, especially by those groups that are affected the most. IMF agreements allow leaders to enact reforms that they would otherwise be unable to enact (Prezeworski and Vreeland 2000; Vreeland 2002). By tying the leader's desired policies to the policies of the IMF, the costs of rejecting the conditions of the loan are increased, thereby reducing the chance that the loan will be unsuccessful (Vreeland 2002).

Leaders may also implement IMF agreements to attain additional loans or financing support from other institutions (Fischer 1997). The presence of an IMF agreement brings in more aid from outside sources that wait for the IMF to make the first move and attach needed conditions. Thus, IMF agreements act as a "green light" for investors indicating that reforms are taking place to provide a friendlier investment environment (Bird and Rowlands 2001; Bird and Rowlands 2002). In addition, by providing accurate information regarding the state of the economy, IMF agreements do a great deal to "facilitate reputation-building on the part of post-stabilization governments" (Collier and Gunning 1999: F649). The post-adjustment levels of transparency are much higher, which helps restore investor confidence.

There is also an incentive to accept these loans if the leader perceives that there is a reasonable possibility that the loans will help correct the balance of payment crisis. The influx of foreign currency from a SAL can immediately help refill the foreign reserves of the state. However, scholars are divided with respect to whether the loans actually provide long-term improvement (Pastor 1987; Gylfason 1987; Khan 1990; Bird 1996; Conway 1994), or just exacerbate the problem (Edwards and Santaella 1993; Connors 1979; Przeworski and Vreeland 2000).

It is a reasonable assertion, then, that the IMF also makes decisions partly based on the economic viability of the structural adjustments demanded by the loan (Haggard, Lafay and Morrisson 1995). The strongest determinant as to whether the IMF chooses to provide a loan is the extent to which the state is mired in economic problems. Conway (1994) argues that the rate of economic growth and the state of the current account are the most substantively important factors causing participation in loans. Other balance of payment conditions strongly affect the supply-side of IMF arrangements, including the real effective exchange rate, level of external debt, GDP growth, GDP per capita and whether the state was previously involved in an IMF loan (Knight and Santaella 1997). Contrary to the IMF's "Doctrine of Economic Neutrality", scholars find that political calculations may affect the decision to lend, primarily because the weighted voting scheme provides the US with a virtual veto on all lending decisions. Consequently, countries that change their political proximity (measured in United Nations votes) toward the US are more likely to be rewarded with loans (Thacker 1999).

Unfortunately, the remedy for the problems may be as harmful. IMF agreements may generate many different sources of political instability. While different types of loans offer various short- and long-term goals, they all demand that future funds be made available only when the four general conditions attached to the loans have been met (Biersteker 1990).¹ First, the IMF demands that the country devalue its currency and allow for market-determined exchange rate adjustments. This is aimed at correcting short-term balance of payments problems by making imports more costly

¹IMF agreements include stand-by arrangements, extended fund facility loans, structural adjustment facility loans and enhanced structural adjustment loans.

and making exports more attractive. The second condition is an anticipatory reaction to the inflation that traditionally follows devaluation. In order to manage demand, the IMF suggests slowing the rate of growth in money supply, government fiscal adjustment and wage restraints. The government's deficit is reduced by limiting current government spending and increasing revenue through improvements on the collection of income and corporate taxes, and the selling of public enterprises. The third condition is premised on restoring market mechanisms. This includes reduction of price controls (ending subsidies), increasing interest rates, and liberalization of trade through lowering tariffs, eliminating trade licensing, and phasing out export incentives. All of these policies are aimed at increasing competition and improving the efficiency of domestic production. The final condition of adjustment loans includes privatization, which helps generate revenue and improves the efficiency of production (Biersteker 1990).

The IMF often demands a reduction in the budget deficit, which entails improving tax collection, wage restraints, subsidy removal and constraining the size of the public sector (Fischer 1997). Political instability flows directly from the distributional impacts of stabilization policies, because the reforms impact various groups in different ways. IMF arrangements can directly lead to riots and political unrest due to changes in redistributive policies, as shown in the cases of Venezuela, Cote d'Ivoire and Ecuador (Bienen and Gersovitz 1985). Since some disadvantaged groups are likely to hold the government accountable for their economic situation, IMF adjustment programs have the potential to threaten the leader's hold on power. In the only analysis of its kind, Smith and Vreeland (2006) employ a duration analysis to examine the effects that IMF agreements have on the survival rates of leaders from democracies and autocracies. They find that the effects of loans on leader survival depend on domestic institutions and the motivations for leaders seeking these loans. While their work is particularly innovative in that it uses leaders' motivations as a control variable, Smith and Vreeland do not accurately capture the decision-making by leaders to participate in the loans. With the use of a previously unavailable econometric estimator, I model the decisions to accept a structural adjustment loan as a selection procedure, which affects the impact of those agreements on leader tenure. This method allows me to empirically model Smith and

Vreeland's assumption that post-reform survival is an important component of the leader's decision to accept a loan. Consequently, the estimation technique used in this project is more realistic than Smith and Vreeland's (2006) approach because we estimate leader survival *conditional on receiving a loan*, rather than the effects of loans on leader survival *controlling for the motivations for accepting a loan*. Once the decision to participate in a loan is modeled, there are substantively important differences in the tenure of democratic and authoritarian leaders under IMF loans.

Self-Selection and Structural Adjustment Loans

I assume that a leader's fundamental goal is to stay in office (Downs 1957). Although the leader may have other goals (improving his legacy, implementing his policy preferences, etc), these goals are best served if the leader remains in office. This argument suggests that leaders will try to resolve any problem that threatens their ability to maintain office, of which economic crisis is a prime example. Although economic crises affect most areas of society in some way, there are certain groups that are especially vulnerable to crises. Increasing budget deficits encourage leaders to produce money supply growth at a rate faster than the income growth rate, resulting in inflation. On the other hand, the costly austerity conditions also demand drastic reductions in government programs. These consequences damage key groups within the leader's core supporters because the leader may be unable to completely shield those groups from the negative effects.

Will the public blame the leader for poor economic conditions? In order to answer this, one must first look at the idea of legitimacy. Democratic citizens, for the most part, view their leader as legitimate because he came to power through free, fair and competitive elections. Legitimacy not only means that the leader can act in the interests of the citizens, but also that he will be accountable. The shadow of an upcoming election² means that the public can threaten to remove the leader from office because of policy failures. Because there is a strong relationship between

²Or possible removal by the parliamentary opposition via a no-confidence motion in parliamentary democracies.

economic conditions and accountability (see Lewis-Beck and Paldam 2000 for a review), I argue that citizens in a democracy will hold their leader accountable for economic crises.

Bueno de Mesquita et. al. (1999, 2003) provide a particularly salient and elegant theory that offers a simple explanation for the differences in expected responses by leaders from different regimes to adjustment. In their work, they examine why particular policy failures dramatically reduce leader survival while others do not. This relationship is conditioned by the size of the winning coalition and the selectorate. The selectorate is the subset of the population that has the ability to participate in choosing the leader of the country, while the winning coalition is the group of individuals who the leader depends on for support in order to maintain power. In democracies, the size of the winning coalition is functionally tied to the size of the selectorate through the electoral rules. Leaders maintain support through the provision of public and private goods. The larger the winning coalition, the more difficult it is for the leader to maintain their support through the provision of a finite set of private goods. As the winning coalition approaches the size of the selectorate, the leader depends on public goods, which “affect the welfare of everyone in the state,” and can include “political freedoms, national security, [and] general economic growth policies that lift the total size of the pool of resources of the state” (Bueno de Mesquita et al. 1999: 149).

Policy failures are more dangerous to the leader’s survival when there is a small selectorate and large winning coalition. Holding the selectorate constant, “decreasing the size of the winning coalition increases the loyalty of members of a leader’s winning coalition because the chance that a defector will be left out of the rival’s winning coalition is greater” (Bueno de Mesquita et al. 1999: 153). The most stable system is one in which there is a large group of potential supporters (selectorate), with a small number of supporters needed to maintain power (winning coalition) (Bueno de Mesquita et al. 1999). Based upon these assertions, they argue that policy failures will not impact survival rates in states with large selectorates and small winning coalitions, because their core constituents demand private, not public, goods. Democracies traditionally have large selectorates and large winning coalitions, while autocracies intrinsically have small winning

coalitions (with varying sizes of the electorate). Reform is likely to reduce the ability to provide public goods but not necessarily private goods.

On the other hand, authoritarian leaders do not have the same sense of election-driven legitimacy as democratic leaders. Traditionally, authoritarian governments have a weaker connection between economic conditions and support for the government, primarily because of the lack of free, fair and competitive elections. Consequently, authoritarian leaders do not need to have electoral legitimacy in order to maintain power, as long as they have support from the key groups within their ruling coalition. With a finite set of resources, the leader is faced with the choice of spending government revenue on investment, public welfare and development projects, or patronage to his coalition of key supporters. Economic crises traditionally decrease the amount of public money that the leader has at his disposal, implying that projects that provide public goods may have to be reduced post-reform. The general public will be hurt by reductions in subsidies, elimination of price ceilings, or implementation of wage restraints, meaning that the leader will choose to focus his limited resources at shoring up support for his administration. Since authoritarian leaders rely on smaller winning coalitions, they are better able to insulate their coalition from the detrimental effects of adjustment. Further, an influx of aid may provide the authoritarian leader more funds to disperse as patronage to the members of his coalition. Satisfying his winning coalition at the expense of public goods designed for the electorate decreases his chance of being removed from office.

These differences in responses to adjustment are largely supported by the literature on the ability of authoritarian leaders to withstand adjustment to a greater extent than democratic leaders (Bienen and Gersovitz 1985; Remmer 1986; Haggard and Kaufman 1992; Nelson 1990). IMF agreements are conditioned on fiscal adjustment, which includes decreasing government spending through expenditure reduction and expenditure switching, both of which will damage the leader's ability to provide public goods (van de Walle 2001). "Expenditure reduction" involves contractionary measures (cuts in money supply) that indiscriminately affect all parts of the population.

On the other hand, “expenditure switching” entails redistributing income within the economy to increase incentives for market operations; this often times involves switching funds traditionally spent on consumption over to investment. These types of reform are the most likely to target specific groups, but they also give the leader the most leverage in deciding which groups to target (van de Walle 2001). A key difference is that loans affect the provision of public goods more than private goods, allowing leaders with smaller winning coalitions (autocracies) to survive. Further, authoritarian leaders have another option that democratic leaders do not have. They are able to maintain a more stable political environment in the face of economic crisis through the use of repression (Gelpi 1997).

It is perhaps helpful at this point to provide an empirical example of this selection procedure at work. In 1980, Ghana was a fledgling democracy facing major socioeconomic decline (with a *Polity* score of 6). President Dr. Hilla Limann recognized that reform needed to occur, but also realized that his hold on power was tenuous because of the multiple coups in the years before he came into office. Although he secretly held meetings with the IMF to push for desired reforms, no action resulted from the negotiations. “Factional disputes within the government and fears of popular opposition to stabilization measures” meant that his already tenuous hold on power in the fledgling democracy would be pushed to the limits by enacting the adjustment reforms (Nelson 1990: 273). Although Limann incorrectly assumed that the costs of adjusting would outweigh the dangers of the economic crisis,³ he selected himself out of an IMF arrangement. He avoided the IMF because, in his judgment, “devaluations cause coups” (Nelson 1990: 326).

An interesting empirical puzzle arises from this discussion. On one hand, studies have demonstrated that democratic leaders are more vulnerable to the effects of structural adjustment than authoritarian leaders (e.g., Haggard and Kaufman 1992). On the other hand, democratic leaders may benefit more from the loans than authoritarian leaders; “not only does the IMF program provide a loan but also a convenient scapegoat for the economic pain that economic reforms may bring”

³He removed in late 1981 in a coup orchestrated by Jerry Rawlings.

(Smith and Vreeland 2006: 268). At its very foundation, choosing whether to participate in an IMF agreement represents a political decision with accompanying consequences, both beneficial and destructive. First, leaders are significantly more likely to halt structural adjustment loans immediately before an election (Dreher 2003), even though the loan may increase their probability of reelection (Dreher 2004). Also, governments that delay reforms are predominantly from politically fragile systems, while governments implementing reforms tend to have the support of wide coalitions (Nelson 1990). Together these different findings help paint a picture of a leader evaluating the domestic environment before selecting himself into a potentially politically tenuous situation. I propose a solution to this puzzle that is based on the idea that leaders are rational office-seekers that are unwilling to choose policies that put their own tenures at risk. Only leaders confident in their futures after adjustment will agree to structural adjustment in the first place. Authoritarian leaders will be more likely to accept agreements because they have greater capacity to withstand the shocks of adjustment; since democratic leaders are more vulnerable to removal after a loan occurs, they will be more hesitant to accept a loan. This leads me to my hypothesis:

Hypothesis: The effect of structural adjustment loans on leader survival is conditional on regime type; democratic leaders will have shorter post-reform tenures than authoritarian leaders.

Data & Methods

In order to test these hypotheses, I utilize a data set originally created by Bienen and van de Walle (1991) and updated to 2000 by Bueno de Mesquita et al. (2003). The unit of analysis is the leader-year and the data set extends from 1970 to 1999.⁴ Because the dependent variable is the amount of time that a leader has stayed in power, I utilize a duration analysis, which will be expanded upon

⁴Since the data on the provision of structural adjustment loans begins in 1970, there are a number of leaders who are in the analysis, but begin before the sample starts (at $t > 0$). The Weibull model successfully deals with both these issues and prevents either misleading results or bias caused by omitting censored cases from the analysis (Box-Steffensmeier and Jones 1997: 17-19).

later in this section.⁵

IMF agreements are operationalized as a dummy variable indicating whether an IMF agreement took place during that leader-year.⁶ Since the four types of loans⁷ have varying substantive goals but the same battery of conditions they are aggregated into one measure.⁸ For the data sources, theoretical expectations, and summary statistics⁹ for the variables used in the selection equation, see Table 1.

[TABLE 1 about here]

There are a number of other variables that have been theorized to have an effect on the survivability of leaders, including regime type. Democratic leaders are subject to periodic elections that produce a risk that the leader will choose to be removed by the citizenry. Alternatively, autocratic leaders are largely not threatened by the prospect of election, either because there is not an election, or the government has reduced political opposition to such a level where the outcome of the election is predetermined. By including regime type into the duration model, we can determine whether the effects of loans on leader survival vary across regime types.

⁵The other principle advantage to using duration analysis over OLS is that OLS is unable to deal with the naturally occurring time dependence of a process like leader tenure. I make the assumption that the probability of a failure at time t is a function of a list of covariates and the probability that the event happened at time $t - 1$. This assumption leads to the natural conclusion that any omitted variables will lead to autocorrelation, which OLS cannot deal with satisfactorily. Logit analyses fails because “an indicator variable cannot capture the variability in duration time a state spends prior to adoption—precisely the effect we are trying to understand” (Box-Steffensmeier and Jones 1997: 1417). This causes inefficient estimates with large variances.

⁶The *IMF Annual Reports* provides the start and end (or termination) date for the IMF agreements, which allows one to determine whether the agreement was signed during a leader’s tenure.

⁷First, the stand-by arrangements begin in 1952, and are by far the most popular form of loan up until the mid-1960s. These loans are focused on medium-term assistance for countries with balance of payments difficulties, and are aimed at short-term stabilization. Next, the extended fund facility (started in September 1974) also addresses balance of payments difficulties, but since the concerns are long-term they include both stabilization and structural reforms. Lastly, the structural adjustment facility (started in 1986) and enhanced structural adjustment facility (started in 1989, combined with the structural adjustment facility in 1999) are focused on addressing long-term structural balance of payments difficulties, with an emphasis on sustained poverty-reducing growth (*IMF Annual Report*: 2009).

⁸This is not problematic because although there are important differences in the prescriptions that the same type of loan may give across countries, they all “reflect the prominence of exchange rate adjustment and public expenditure reductions in the stabilization measures and of trade liberalization and the abolition of price controls in the set of structural reforms” (Collier and Gunning 1999: F635).

⁹The selection model sample is used to calculate summary statistics.

I already noted that both economic crises and IMF adjustment can incite political violence in developing nations. In order to help minimize the potential threat of reverse causality, I include the one-year lag of the riots variable. The number of riots in a state is a valid indicator of the overall level of political instability (Banks 2002). A riot is defined as “any violent demonstration or clash of more than 100 citizens involving the use of physical force” (Banks 2002).

The desire for the IMF is largely a result of balance of payment problems; if a state has a low level of international reserves, they are less able to minimize balance of payment crises by using their own stock of foreign reserves (Knight and Santaella 1997). Other economic conditions affecting the balance of payments will also affect the decision to participate, including the real effective exchange rate, total terms of trade, and the level of external debt (Conway 1994; Knight and Santaella 1997; Vreeland 2002). IMF agreements are not solely the result of economic conditions, as various scholars have identified the importance of political considerations (e.g., Thacker 1999; Stone 2004). Some political determinants of IMF loans include regime type, time period (oil crisis of late 1970s), leader tenure, whether the state had an IMF agreement in the previous period and the number of previous IMF agreements (Knight and Santaella 1997; Bird 1996). These variables are all included in the selection equation, and the sources and theoretical expectations are described in Table 1.

The process of choosing between continued economic crisis and the costly austerity programs that accompany IMF loans is the political equivalent of picking one’s poison. In the next section, I simultaneously model the decision to accept a loan and that loan’s effects on leader tenure. As I will illustrate with the selection model, contrary findings (e.g., Smith and Vreeland 2006) are easily explainable by the considerable selection bias in studies of consequences of IMF loans. Failing to incorporate the non-random selection induced by the decision to participate in the IMF loan biases the parameters in unknown directions and falsely points to duration independence.

The Process of Picking the Poison

In order to account for non-random sample selection caused by the decision to participate in these loans, I utilize a Full-Information Maximum Likelihood (FIML) model that simultaneously estimates the selection outcome (participation in an IMF agreement) and the duration outcome (length of leader tenure given an IMF agreement).¹⁰ This procedure is analogous to the Heckman selection model for OLS (Heckman 1979) and performs better in Monte Carlo tests than the alternative of ignoring the selection bias (Boehmke, Morey and Shannon 2006). Not only does non-random sample selection bias estimates for the error term and the parameters in unknown directions, but it can also falsely indicate the presence of duration dependence (Boehmke, Morey and Shannon 2006).

I theorize that the effects of IMF adjustment on leader survival depend on the leader's regime type. This is because leaders choose whether to participate in IMF loans with their expected post-reform tenures in mind. I therefore expect to find three empirical results from the Weibull Selection model (Boehmke, Morey and Shannon 2006). First, I expect to find that, given an IMF agreement, the more democratic a state is, the shorter that leader's tenure will be. Second, I theorize that because of their shorter post-reform tenures, democratic leaders will be less likely to participate in IMF loans, all else equal. Finally, since leaders "pick their poisons" based partly on their likelihood of surviving the necessary reforms, I expect to find a positive correlation between the the likelihood of accepting an agreement and the leader's post-reform duration. The results of the simultaneously estimated selection equation and the duration model are presented in the second column of Table 2. As a comparison, the results from a Weibull duration model are presented in the first column.

¹⁰The log likelihood for the Weibull selection duration model is the following: $\ln L(\beta, \gamma, \alpha, \rho | \mathbf{X}, \mathbf{W}, \mathbf{Y}, \mathbf{c}, \mathbf{d}) = \sum_{i=1}^n c_i(1 - d_i)[- \lambda_{1i} + \ln(1 + \alpha(2\exp(-(\lambda_{2i}y_i)^\rho) - 1) \times (\exp(-\lambda_{1i}) - 1)) + \ln(\rho) + \ln(\lambda_{2i}) + (\rho - 1)\ln(\lambda_{2i}y_i) - (\lambda_{2i}y_i)^\rho] + c_i d_i[- \lambda_{1i} - (\lambda_{2i}y_i^0)^\rho + \ln(1 + \alpha(1 - \exp(-(\lambda_{2i}y_i^0)^\rho))(1 - \exp(-\lambda_{1i})))] + (1 - c_i)[\ln(1 - \exp(-\lambda_{1i}))]$, where y_i is a continuous duration outcome $y_i = \exp(-\mathbf{x}_i\beta)\varepsilon_i$, c_i is a binary censoring variable equal to 1, α is the measure of association between the two equations, ρ is the error correlation, and d_i is an indicator variable for whether an observation is right-censored. For a more detailed explanation of the components, see Boehmke, Morey and Shannon (2006: 195-196).

[TABLE 2 about here]

The selection equation in the second column predicts whether a loan occurs in that leader-year.¹¹ Similar to either a logit or probit, positive coefficients indicate that the variable increases the probability of an IMF loan. As hypothesized, the polity regime type variable is negative, indicating that the more democratic a country is, the less likely they will accept an IMF loan. I argue that this is because authoritarian leaders are much better equipped at weathering the storm that accompanies economic adjustment, so they are more likely to participate in these loans. Many of the economic variables in the selection model are not significant. The total foreign reserves variable is statistically significant and in the expected direction. This finding makes sense, as the larger reserves a state has, the less they need an IMF loan. States with larger trade balances are much less likely to receive a loan than those running trade deficits. The other economic variables are not statistically significant, possibly because the level of reserves is the most important factor in accepting a loan. Moreover, the oil crisis dummy variable is statistically significant, indicating both an increase in demand for IMF loans and a subsequent decrease in alternative lenders. Consistent with previous research (Bird 1996), we find that the more total loans given by the IMF in that year, the more likely a given state will accept an IMF loan. Also, states that have previously had IMF arrangements are likely to receive another loan. This is shown by the positive and statistically significant coefficients for both the lagged dependent variable ($IMF\ SAL_{t-1}$) and the number of previous SALs by that country. Leaders that just began their tenures are more likely to accept an IMF arrangement.

The duration equation in the selection duration model estimates the tenures of leaders under IMF agreements. It is important to note that the coefficients in Table 2 are in accelerated failure time (AFT) metric, which implies that larger coefficients indicate longer durations and smaller hazards. Given that it is a selection model, the coefficients represent the effects of the variable

¹¹The usefulness of this analysis depends on accurately estimating the probability of participating in an IMF agreement in the selection model. The selection model, when estimated as a probit with the dichotomous agreement variable as the dependent variable, correctly identifies 79.6% of the cases. This represents a 5.6% increase over the modal category.

on leader duration *given the occurrence of an IMF agreement*. To test our hypothesis, we include regime type with the expectation that the coefficient will be negative. This implies that, given an IMF agreement, the more democratic a nation, the lower the leader's duration.

It is most helpful to view this relationship as a graph, presented in Figure 2.

[FIGURE 2 about here]

The top panel of Figure 2 provides the predicted survival rates for three types of governments under an IMF agreement, holding all other variables constant.¹² The top half shows the predicted survival rates for the three regime types while the bottom panel (below 0) shows the first differences in predicted survival rates. As expected, authoritarian regimes are much more likely to withstand the costs of structural adjustment and maintain their position than leaders of either mixed regimes or democracies. The survival rates for authoritarian leaders decrease slowly over time in office, while the survival rates for democracies decline exponentially. This is to be expected, as the vast majority of democratic leaders do not last more than 10 years in office. It is interesting to note, however, that it is during their 4-6 years in office that the first differences between the survival rates for various regimes are the greatest in magnitude. For all leaders the first few years in office have high survival rates. However, when under an IMF agreement at year $t + 5$, survival rates for authoritarian leaders (about 0.60) and for democratic leaders (about 0.10) are vastly different. As expected, the first difference from democratic and autocratic leaders is the largest of any of the first differences, with the difference the greatest at about year $t + 5$. Regardless of the political, economic and social circumstances, authoritarian leaders have much higher survival rates than leaders of both mixed and democratic regimes when faced with an IMF arrangement. This buttresses my theory that democratic leaders' hold on power will be more tenuous after an IMF loan.

¹²These graphs are produced with the aid of the "durselgr" package in Stata 9 (Boehmke 2005). The Polity variable is held at the three different scenarios of regime type: autocracy (Polity = -10), mixed regime (Polity = 0) and Democracy (Polity = 10). The first differences are calculated by subtracting the predicted survival rates of democracy-mixed, mixed-autocracy, and democracy-autocracy, respectively. The continuous variables are set to their sample means while the *SAL Signed by Previous Leader* variable is set to 0.

The rest of the control variables perform as expected, except for *GDP Growth* (which is not statistically significant) and the dummy variable measuring whether the current SAL was signed by a previous leader (which is negative and significant). The latter result indicates that there is no “scapegoating” benefit that has been previously suggested by scholars (e.g., Remmer 1986). Rather than increasing a leader’s duration by allowing the leader to blame the previous leader for the difficult adjustment, being under a previous leader’s arrangement decreases the current leader’s tenure. The inflation rate and the number of riots in the previous year both have negative and statistically significant effects on tenure, indicating that domestic economic and social problems increase the hazard for termination.

The ancillary parameters provided by the selection model also provide vital information about the underlying hazard rate and the importance of the selection equation. The first parameter, α , provides the correlation between the error components of the two models with the null hypothesis that the non-random sample selection is ignorable. The positive and statistically significant α parameter indicates that there is unignorable selection bias because the decision to participate in an IMF loan creates non-random sample selection in the analysis of their effects on leader survival. The positive correlation is generally consistent with my hypothesis regarding the danger of loans for leaders. It indicates that the higher the expected post-reform tenure, the more likely the leader will accept an IMF arrangement. This also provides support for the third component of my theory, mainly that there is positive correlation between the decision to enter into an agreement and the leader’s anticipated survival rates. Also, the statistically significant ρ parameter points to a rejection of the null hypothesis of duration independence. This is shown by Boehmke, Morey and Shannon (2006) to be a result of estimating a naive model in the face of non-random sample selection. They show that this can bias the duration dependence parameter (ln_{ρ}) in the same direction as the error correlation (α).

To what extent does the selection bias inherent in the choice to accept a loan actually affect the estimation of the survival rate? Estimating a Weibull model in the face of selection bias has been

shown to bias the constant downward in Monte Carlo simulations. Since a higher constant indicates a smaller hazard rate and longer leader tenure, by comparing the constants from the Weibull and Selection Duration model in Table 2, one can see that the Weibull model artificially inflates the risk of leader termination because it ignores the selection procedure (Boehmke, Morey and Shannon 2006). Figure 3 further addresses this question by providing both the Weibull (shown in the first column of Table 2 and the Selection model estimated survival rates for leaders under an IMF arrangement signed by the current leader, for four different regime types.¹³

[FIGURE 3 about here]

We can see that the similarity in survival rates between the two models varies as a function of regime type. For the first three scenarios (authoritarian, mixed-authoritarian and mixed-democratic) the Weibull duration model substantially under-predicts the survival rates of leaders early in their tenures ($t < 5$) principally because it under-estimates the effects of the selection mechanism. Though the lines appear close because of the scale of the figures, in some cases it is a difference of over .10 in the predicted survival rates. When the selection procedure is taken into account by the selection model, the estimates of the leader survival rates for various regimes are much smaller later on.

The only scenario in which the Weibull model substantially over-estimates the survival rate is for democratic leaders, where there are meaningful differences in the predicted survival rates after $t + 3$. This makes intuitive sense because democratic leaders have a much more tenuous hold on power, which discourages them from choosing to participate in an IMF agreement. Since the Weibull model is unable to incorporate the relative caution that democratic leaders exercise when deciding whether to participate in a loan, it estimates a much higher survival rate than the selection duration model. This figure is further evidence that for authoritarian and mixed-authoritarian regimes, the estimated effects of IMF adjustment loans are negatively biased, in favor of failing to

¹³Autocracy (Polity = -10), Mixed-Autocracy (Polity = -3), Mixed-Democracy (Polity = 3), and Democracy (Polity = 10).

reject the null hypothesis that the effect of IMF arrangements is equal to 0. This supports my assertion that the selection procedure substantially improves the prediction of leader's survival rates when modeling scenarios where leaders are faced with both economic crisis and IMF adjustment.

Conclusion

When examining the options for addressing economic crises, leaders must pick their poison. While some choose to withstand pressure to accept IMF loans, others look to the IMF for help in solving balance of payments problems. In this paper I examine why leaders pick the poison they do. I develop a theory that suggests that the decision to participate in an IMF loan and the loan's subsequent effects on leader survival are intricately linked. Autocrats rely on a much smaller segment of the population in order to stay in power. They maintain the support of their winning coalition through the provision of private goods, which can be better insulated by an authoritarian leader in a post-reform environment. Further, autocrats are able to weather the storm of reform much easier because they can repress groups of the public to lessen the risk of political violence from redistributive concerns. Both democratic and authoritarian leaders make a decision whether to approach the IMF for a structural adjustment loan based on their hold on power. In this case, both types of leaders pick their poison. Since democratic leaders have a more tenuous hold on power, they are less likely to open themselves up to the political unrest that accompanies IMF loans, as demonstrated by the negative coefficient for the regime type variable in the selection model. Alternatively, authoritarian leaders are more likely to accept an IMF loan because they know that their hold on power is stronger than democrats, so they are much more likely to be able to withstand the costly reforms that come with adjustment.

This theoretical argument was largely supported by the data. Previous research has suggested that the tenures of democratic leaders are lengthened by participating in IMF loans (Smith and Vreeland 2006). I argue that these counter-intuitive findings are possibly a result of non-random

sample selection caused by the politically costly decision for a leader to pull his state into an IMF agreement. One possible explanation for these contradictory findings is the fact that estimating a model on leader survival rates in the face of non-random sample selection has the potential to bias coefficients (Boehmke, Morey and Shannon 2006). As expected, there is a positive correlation between expected post-reform tenure and the decision to accept an IMF loan. For this reason, authoritarian leaders are more likely to select themselves into IMF agreements because they view their post-reform political situation as much more conducive to their survival in office than democratic leaders. Democratic leaders, on the other hand, are more cautious about entering into agreements because they are more vulnerable to removal. These factors combine to result in the vast differences in expected tenures between authoritarian and democratic leaders when faced with IMF adjustment loans under the same exact domestic and international circumstances. The poison leaders pick depends on their assessments of their own post-reform tenure.

This can possibly explain some of those anomalies highlighted by Vreeland (2003) regarding those countries most likely to accept an offer but decide to attempt to withstand the crisis on their own. A possible explanation for these anomalous cases is that these were leaders who were possibly acting on their own interests rather than the best interests of the state. Even though the state may have benefited from the loan, the leader may have sensed that his post-reform tenure was more tenuous.

By developing a theory that the motivations for participating in loans is a function of the leader's expected post-reform tenure, we can gain a better understanding of the politics of IMF lending. This also has implications for the potential success of IMF agreements, as it is important to realize that cases where the loans may be successful may also have leaders who spurn these loans because they anticipate their removal. In other words, studies of IMF agreement success must realize that the political concerns of leaders represent a substantial veto player. In other words, studies must incorporate the political motivations for leaders to participate in these loans.

References

- Banks, Arthur. 2002. *The Cross-National Time-Series Data Archive*.
<http://www.databanks.sitehosting.net/www/index.htm>.
- Bienen, Henry & Mark Gersovitz. 1985. "Economic Stabilization, Conditionality, and Political Stability." *International Organization* 39:729–754.
- Bienen, Henry & Nicolas van de Walle. 1991. *Of Time and Power: Leadership Duration in the Modern World*. Stanford, CA: Stanford University Press.
- Biersteker, Thomas J. 1990. "Reducing the Role of the State in the Economy: A Conceptual Exploration of IMF and World Bank Prescriptions." *International Studies Quarterly* 34:477–492.
- Bird, G. 1996. "Borrowing from the IMF: The Policy Implications of Recent Empirical Research." *World Development* 24:1753–1760.
- Bird, Graham & Dane Rowlands. 2001. "Catalysis or Direct Borrowing: The Role of the IMF in Mobilising Private Capital." *The World Economy* 24:81–98.
- Bird, Graham & Dane Rowlands. 2002. "Do IMF Programmes Have a Catalytic Effect on Other International Capital Flows?" *Oxford Development Studies* 30:229–249.
- Boehmke, Frederick J. 2005. "DURSEL: A Program for Duration Models with Sample Selection (Stata version)." Version 2.0. Iowa City, IA: University of Iowa.
- Boehmke, Frederick J., Daniel S. Morey & Megan Shannon. 2006. "Selection Bias and Continuous-Time Duration Models: Consequences and a Proposed Solution." *American Journal of Political Science* 50:192–207.
- Box-Steffensmeier, Janet & Bradford S. Jones. 1997. "Time Is of the Essence: Event History Models in Political Science." *American Journal of Political Science* 41:1414–1461.

- Bueno de Mesquita, Bruce, Alastair Smith Randolph M. Siverson & James D. Morrow. 2003. *The Logic of Political Survival*. Cambridge, MA: MIT Press.
- Bueno de Mesquita, Bruce, James D. Morrow Randolph M. Siverson & Alastair Smith. 1999. "Policy Failure and Political Survival: The Contribution of Political Institutions." *The Journal of Conflict Resolution* 43:147–161.
- Collier, Paul & Jan William Gunning. 1999. "The IMF's Role in Structural Adjustment." *The Economic Journal* 109:F634–F651.
- Connors, T.A. 1979. "The Apparent Effects of Recent IMF Stabilization Programs." *International Finance Discussion Papers* 135 .
- Conway, Patrick. 1994. "IMF Lending Programs: Participation and Impact." *Journal of Developmental Economics* 45:365–391.
- Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.
- Dreher, Axel. 2003. "The Influence of Elections on IMF Programme Interruptions." *Journal of Developmental Studies* 39:101–120.
- Dreher, Axel. 2004. "The Influence of IMF Programs on the Reelection of Debtor Governments." *Economics and Politics* 16:53–75.
- Edwards, S. & J.A. Santaella. 1993. Devaluation Controversies in the Developing Countries: Lessons from the Bretton Woods Era. In *A Retrospective on the Bretton Woods System*, ed. M.D. Bordo & B. Eichengreen. Chicago, IL: University of Chicago Press.
- Fischer, Stanley. 1997. "Applied Economics in Action: IMF Programs." *American Economic Review* 87:23–27.
- Gelpi, Christopher. 1997. "Democratic Diversions: Government Structure and the Externalization of Domestic Conflict." *The Journal of Conflict Resolution* 41:255–282.

- Gylfason, T. 1987. "Credit Policy and Economic Activity in Developing Countries with IMF Stabilization Programs." *Studies in International Finance* 60 .
- Haggard, Stephen J., Jean-Dominique Lafay & Christian Morrisson. 1995. *The Political Feasibility of Adjustment in Developing Countries*. New York: Development Centre of the Organisation for Economic Cooperation and Development.
- Haggard, Stephen & Robert R. Kaufman. 1992. *The Politics of Economic Adjustment: International Constraints, Distributive Conflicts and the State*. Princeton, NJ: Princeton University Press.
- Heckman, James A. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47:153–161.
- International Monetary Fund. 2009a. "International Financial Statistics." CD-ROM.
- International Monetary Fund. 2009b. *International Monetary Fund Annual Report*. International Monetary Fund.
- Khan, M.S. 1990. "The Macroeconomic Effects of Fund-Supported Adjustment Programs." *IMF Staff Papers* 37:195–234.
- Knight, Malcolm & Julio A. Santaella. 1997. "Economic Determinants of IMF Financial Arrangements." *Journal of Developmental Economics* 54:405–436.
- Lewis-Beck, Michael S. & Martin Paldam. 2000. "Economic Voting: An Introduction." *Electoral Studies* 19:113–121.
- Nelson, Joan M. 1990. *Economic Crisis and Policy Choice: The Politics of Adjustment in the Third World*. Princeton, NJ: Princeton University Press.
- Pastor, M. 1987. "The Effects of IMF Programs in the Third World: Debate and Evidence from Latin America." *World Development* 15:365–391.

- Przeworski, Adam & James Raymond Vreeland. 2000. "The Effect of IMF Programs on Economic Growth." *Journal of Developmental Economics* 62:385–421.
- Remmer, Karen. 1986. "The Politics of Economic Stabilization: IMF Standby Programs in Latin America, 1954-1984." *Comparative Politics* 19:1–25.
- Smith, Alastair & James Raymond Vreeland. 2006. The Survival of Political Leaders and IMF Programs. In *Globalization and the Nation State: The Impact of the IMF and the World Bank*. Routledge.
- Stone, Randall. 2004. "The Political Economy of IMF Lending in Africa." *American Political Science Review* 98:577–591.
- Thacker, Strom C. 1999. "The High Politics of IMF Lending." *World Politics* 52:38–75.
- van de Walle, Nicolas. 2001. *African Economies and the Politics of the Permanent Crisis*. Cambridge, MA: Cambridge University Press.
- Vreeland, James R. 2003. "Why Do Governments and the IMF Enter into Agreements? Statistically Selected Cases." *International Political Science Review* 24:321–343.
- Vreeland, James Raymond. 2002. "Institutional Determinants of IMF Agreements." Working Paper.
- World Bank. 2009. *World Development Indicators on CD-ROM* .

Figure 1: How the Supply and Demand of International Monetary Fund Arrangements Affect Leader Survival

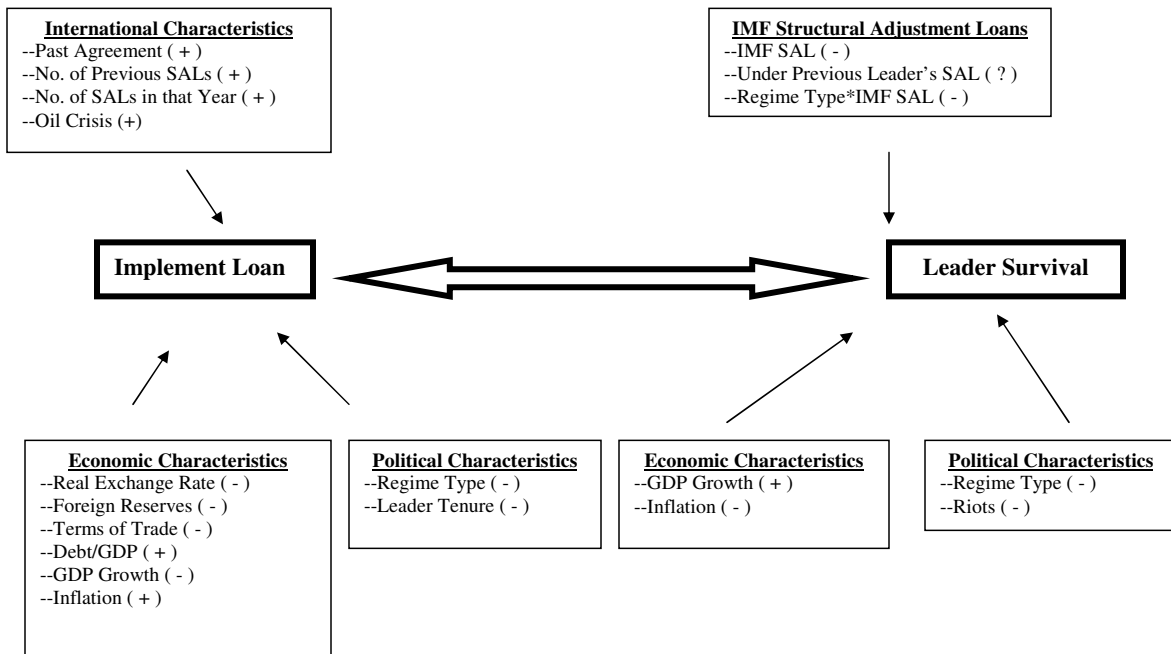


Table 1: Table of Hypothesized Relationships and Coding Procedures

Variable	Source/Coding Mean, Std. Dev., Range	Expectations	
		Pr(IMF)	Duration
IMF Loan (Ongoing or Onset) _t	IMF Annual Reports, various years IMF Loans: 147/589, (0 - 1)		-
IMF Loan _{t-1}	IMF Annual Reports, various years IMF Loans _{t-1} : 183/589, (0 - 1)	+	
Number of Previous Loans	IMF Annual Reports, various years Mean: 4.7, S.D.: 4.9, (0 - 21)	+	
No. of SALs in that Year	IMF Annual Reports, various years Mean: 23.8, S.D.: 5.7, (14 - 35)	+	
SAL Signed by Previous Leader	IMF Annual Reports, various years Previous Loans: 7/147, (0 - 1)		
Regime Type	POLITY IV Mean: 3.21, S.D.: 7.4, (-9 - 10)	-	-
Real Exchange Rate	IMF IFS: Effective Exchange Rate to SDR Mean: 144.9, S.D.: 633.1, (0 - 11,299)	-	
Foreign Reserves	IMF IFS: Total Reserves (in Millions of SDRs) Mean: 2827, S.D.: 4183.1, (1.5 - 19,417)	-	
Terms of Trade	IMF IFS: Trade Balance (in Millions of US\$) Mean: -224.9, S.D.: 4181.7, (-15,072 - 18,636)	-	
Debt/GDP	IMF IFS: External Debt as a % of GDP Mean: 4.2, S.D.: 27.5, (0 - 284)	-	
GDP Growth	WDI: GDP Growth (Annual %) Mean: 3.4, S.D.: 4.6, (-18.3 - 20.3)	-	+
Inflation	WDI: Annual Change in CPI Mean: 17.5, S.D.: 33.6, (-9.8, 373.8)	+	-
Oil Crisis	1974-1979=1, Other=0 1974-1979: 150/589, (0 - 1)	+	
Leader Tenure (in Years)	Bueno de Mesquita et al. (2003) Mean: 6.1, S.D.: 7.1, (0 - 31)	-	
Riots	Banks (2002) Mean: 1.03, S.D.: 2.8, (0 - 14)		-

WDI: World Bank's *World Development Indicators* (2009)

IMF IFS: International Monetary Fund's *International Financial Statistics* (2009).

Table 2: Weibull and Selection Duration Model Results of the Relationship between IMF Structural Adjustment Loans, Regime Type and Leader Survival

	Weibull $-\beta$	Selection $-\beta$
<i>Selection (IMF SAL)</i>		
Polity Score		-0.0251** (0.0106)
Real Exchange Rate (SDRs)		-0.000125 (0.000194)
Foreign Reserves (Millions of SDRs)		-0.000201*** (0.0000456)
Trade Balance (Millions of US\$)		-0.0000394* (0.0000258)
External Debt/GDP		0.000719 (0.00208)
GDP Growth		0.00451 (0.0133)
Inflation		-0.00281 (0.00231)
Oil Crisis: 1974-1979		0.424*** (0.157)
Leader Tenure (in Years)		-0.0207** (0.0115)
IMF SAL _{t-1}		0.405** (0.194)
No. of Previous SALs		0.105*** (0.0160)
No. of SALs in that Year		0.0279*** (0.0116)
Constant		-1.463*** (0.347)
<i>Duration (Leader Tenure under SAL)</i>		
IMF SAL	0.802*** (0.191)	
Polity Score	-0.035*** (0.011)	-0.0575*** (0.0103)
IMF SAL × Polity	-0.014 (0.024)	
SAL Signed by Previous Leader	-0.237 (0.804)	-2.195*** (0.395)
GDP Growth	0.045*** (0.014)	-0.0182 (0.0168)
Inflation	-0.00002 (0.000001)	-0.0131*** (0.00244)
Riots _{t-1}	-0.056** (0.024)	-0.0606*** (0.0186)
Constant	1.357*** (0.107)	2.146*** (0.163)
α		0.637* (0.406)
ρ		0.159* (0.101)
Observations	1578	589

Standard errors in parentheses. One-tailed: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Coefficients are in accelerated failure time metric where larger values imply longer tenures (i.e., smaller hazards).

Figure 2: Survival Rates for Leaders of Various Regime Types Under Structural Adjustment Loans: Selection Duration Model

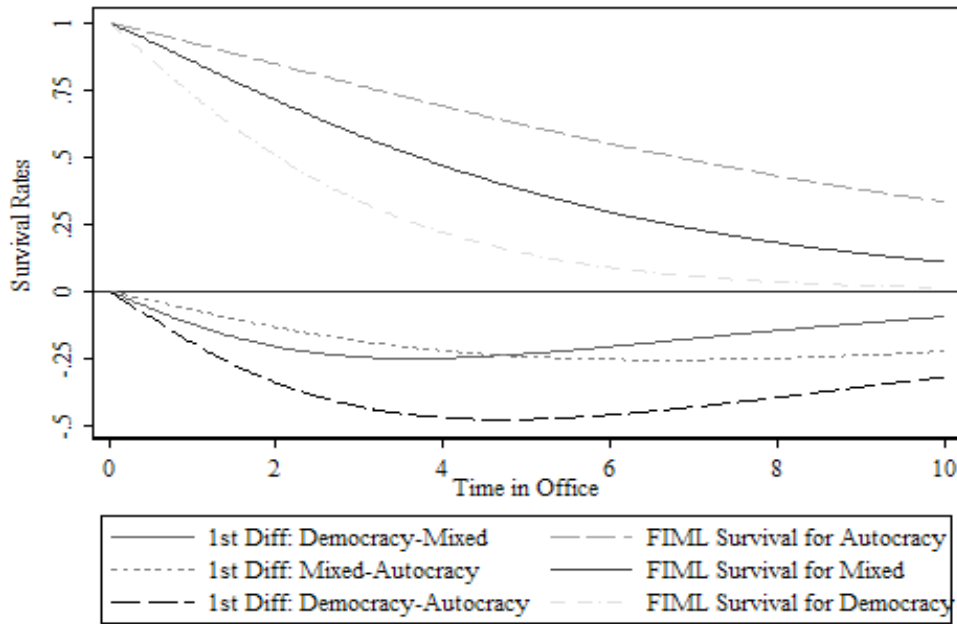
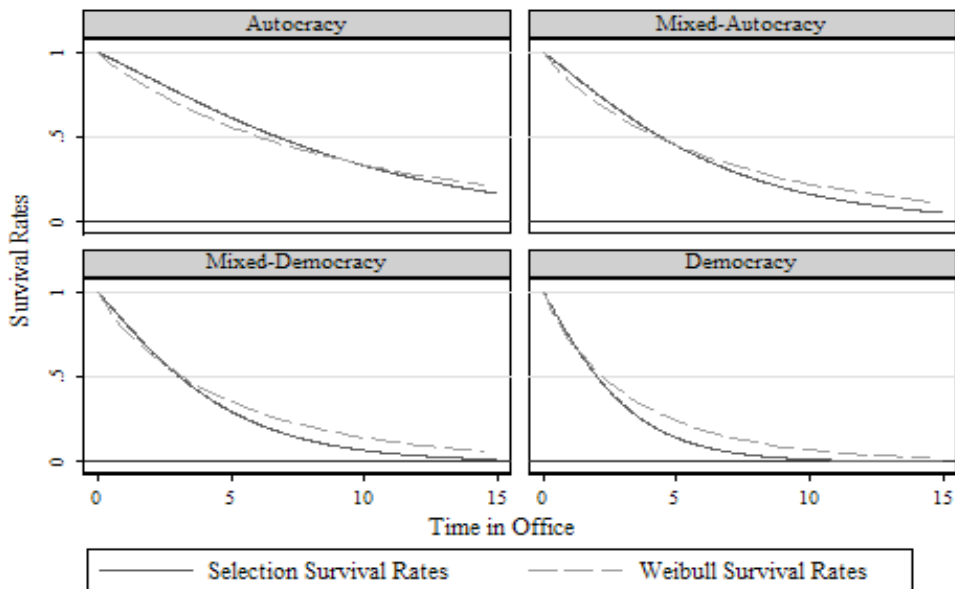


Figure 3: Weibull Model's Under-Estimation of Effect of IMF SALs on Survival Rates of Various Regime Types Compared to Selection Duration Model Estimates



Graphs by 1-Autocracy (-10) 2-Mixed Autocracy (-3) 3-Mixed Democracy (3) 4-Democracy (10)