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IMF Credit: How Important Are Political Factors? A Robustness Analysis

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IMF CREDIT: HOW IMPORTANT ARE POLITICAL FACTORS? A ROBUSTNESS ANALYSIS

Abstract

We test whether, in addition to economic conditions, IMF credit is influenced by political factors. On the basis of a panel model for 128 countries over the period 1972-1998, we find that debt service scaled to exports, international reserve holdings scaled to imports and economic growth, as well as investment are robustly related to IMF credit supply. Arguably, these results are broadly consistent with the IMF's mission. The only political variables which appear to be related to changes in IMF credit are government stability, the quality of the bureaucracy, and a dummy variable indicating the extent of political opposition. Possible interpretations of these findings are discussed.

JEL Classification: F33.

Keywords: IMF credit, political economy.

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1. Introduction

At present 183 countries are members of the IMF and eligible to take out loans from the Fund. Membership requires a contribution to the IMF (quota), which depends on the size of the country's economy. A member-country can draw up to 25% of its quota; to draw more requires a special agreement with the Fund.[1] The IMF attaches conditions to these loans, which, depending on the economic circumstances, may include fiscal austerity, tight monetary policy, and currency devaluations (Przeworski and Vreeland, 2000).

How does the IMF decide on its lending? Article I of the Articles of Agreement of the IMF states that the activities of the Fund should, among other things, "facilitate the expansion and balanced growth of international trade" and "promote exchange stability". In other words, one should expect IMF lending to be based on mainly economic considerations. However, it would be hard to deny that—at least to some extent—political-economic factors may also play a role in the Fund's lending decisions. In fact, some critics of the IMF suggest that political motives might be paramount, although their criticisms are rather different. For instance, Bird and Rowlands (2000) discuss studies which are particularly critical of the Fund, expressing concerns about a lack of appropriate governance in some countries requesting IMF support. Dreher and Vaubel (2000) find a correlation between the characteristics of political regimes and the extent to which countries demand or receive IMF credits. Some of these issues are also prominently discussed in the recent literature on 'country ownership' of IMF and/or Worldbank supported credit programs (Helleiner, 2000).

The literature on the determinants of IMF credit suffers from a variety of drawbacks. First, most authors do not carefully examine the sensitivity of their findings. Thus it is hard to tell whether the variables reported to be significant are really robustly related to IMF credit. Second, although some papers include (a limited number of) political variables, most studies do not offer a systematic analysis of the role that political factors may play.[2]

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[1] There are four main types of IMF agreements: the stand-by arrangement (SBA), the extended fund facility (EFF), the structural adjustment facility (SAF), and the enhanced structural adjustment facility (ESAF), which was replaced by the Poverty Reduction and Growth Facility (PRFG). The fundamental objective of these programs does not differ. Although they are supposed to cover a limited number of years, many countries signed consecutive agreements (Przeworski and Vreeland, 2000).

[2] An exception is Rowlands (1995).

The aim of this paper is to analyze to what extent various political variables that have been suggested in the literature as influencing IMF decisions are empirically robust determinants of the amount of net credit supplied by the IMF. We focus on credit as this issue has received scant attention so far (an exception is Dreher and Vaubel, 2000). Most of the literature has focused on binary choice models for IMF involvement of crisis management. However, it is not only interesting to know the circumstances that lead a country to seek IMF funds, but also to know the factors that determine the amount of IMF credit disbursed. For this purpose, we estimate a panel model for 128 countries over the period 1972-1998 relating the extension of IMF credit to economic and political data.

The remainder of the paper is organized as follows. Section 2 offers a review of previous studies, focusing on political factors that may influence IMF credit, and introduces our political variables. Section 3 explains the modeling strategy and describes the other variables employed, while Section 4 contains the empirical results. The final section offers some concluding comments.

2. Political factors that may influence IMF credit

From the demand as well as the supply side, the literature has suggested that various political factors may influence the IMF decision-making process. We will systematically discuss factors that have been recently suggested in the literature and the proxies that we apply in our empirical model.[3] Appendix A1 summarizes studies that have been published since the beginning of the 1990s (for a review of the older literature, see Bird (1995) and Knight and Santaella (1997)), while Appendix A2 describes all variables that we have used in our research in more detail and gives the sources. Many of the variables can be interpreted both as determinants of government's demand for IMF credit and as criteria by which the IMF may judge the creditworthiness of countries demanding credit. Most studies on IMF credit use

[3] As we use a panel model with fixed time and individual effects, only variables that vary over time and across countries are considered. Therefore, variables like LIBOR and the number of other countries in which the Fund is involved—the latter being suggested by Przeworski and Vreeland (2000) as one of the proxies for 'sovereignty costs'—are not taken up.

reduced-form models so that demand and supply factors cannot be disentangled.[4] For our purpose (i.e. to examine whether political variables really matter for the amount of IMF credit provided) this is no problem.

Not all countries that would be eligible to draw resources from the IMF would decide to do so to the extent that they perceive some loss of discretion over their choice of adjustment policy. Especially, as argued by Bird and Rowlands (2000), governments that perceive a large gap between their preferred policies and those expected in the context of IMF conditionality and that are strongly nationalistic are the least likely to turn to the Fund. To take this into account in our tests, we include a variable reflecting whether a government is very nationalistic (*national*).

Przeworski and Vreeland (2000) suggest that governments are more likely to enter an agreement early in their terms, hoping that any perceived stigma of signing an agreement will be forgiven or forgotten before the next elections. In other words, demand for IMF credit might be higher after election years. Przeworski and Vreeland (2000) report evidence in support of this view. Dreher and Vaubel (2000) argue that elections may lead governments to ask for IMF credit as a means to finance election spending. While IMF resources are rarely allocated directly to the government and various safeguards against the misuse of these resources are routinely incorporated into IMF lending programs, the authors suggest that the availability of IMF credit might indirectly help to finance election spending. Dreher and Vaubel (2000) find that net credit supplied by the IMF is generally higher around election time. To test for the effect of elections, we include two election dummy variables: one for election years for the executive (*elecex*) and one for election years for the legislative (*elecleg*). As previous studies argue that there should be an effect before and/or after the election, we take the lag and the lead of the election dummies.

The possibility of blaming the IMF for the necessary adjustment policies may be an incentive to resort to the Fund. By involving the Fund in the decision-making process, national politicians may be able to shield themselves from the political fall-out of unpopular policies (Vaubel, 1986). This may especially apply to a non-unitary government, for which we include a dummy variable (*non-unit*). Likewise, countries with more unstable and polarized political systems—proxied by seven variables: the

[4] As far as we know, only four studies (Knight and Santaella, 1997, Przeworski and Vreeland, 2000 and Vreeland, 1999, 2001) have tried to disentangle both factors, but the separation of demand and supply

number of political assassinations (*assas*), and revolutions (*revol*), and guerilla problems (*gueril*), presence of ethnic tensions (*ethnic*), the number of government crises (*crises*)[5], purges (purges), and instability within the government (*govchange*)—will have more difficulties to arrange a credible adjustment program and will, therefore, have a higher incentive to turn to the Fund. In this way, they will obtain a seal of approval for a political program and, thus, gain in credibility. On the other hand, the IMF might be less willing to provide its seal of approval when there is less than full political support of such a program. The issue whether international organizations such as the IMF should or should not seek broad local support for the policies they endorse or incorporate in lending conditions is at the heart of the debate on 'country ownership' (see, for instance, Helleiner, 2001). In the end, the existence and direction of the relationship between the above listed variables with the disbursement of IMF resources is an empirical question.

In general, the decision to involve the IMF crucially depends on government's assessment of the political costs that may result from the adjustment policies. A high level of social unrest (proxied by three variables: the number of demonstrations (*demon*), strikes (*strikes*) and riots (*riots*)) *prior* to the disbursement of IMF funds to a county might actually indicate a pronounced need for outside resources—no matter what strings are attached—to help calm an ongoing economic and political crisis.[6] Another implication of this line of reasoning is that dictatorial regimes—proxied by an executive index of competitiveness (*excomp*) and a dummy indicating whether chief executive is a military (*military*)—will have a smaller incentive to request IMF assistance as they can more easily withstand unpopular adjustment programs (Bird and Rowlands, 2001 and Edwards and Santaella, 1993). On the other hand, Przeworski and Vreeland (2000) argue that as dictatorships are less constrained by public opinion and competitive elections, they may make easier negotiation partners for the IMF, and are therefore more likely to get credit. Which, if any, argument prevails is again an empirical question.

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factors in these studies remains a rather difficult task that has drawn severe criticism (see Dreher and Vaubel, 2000).

[5] As government crises may also occur due to an IMF stabilization program, we take the lagged value of crises to circumvent endogeneity.

[6] All these variables enter with a one-period lag. This also helps to avoid the possible endogeneity problem. Demonstrations, strikes, and riots may contemporaneously increase if the government has to take unpopular measures as part of an IMF stabilization program.

Government's willingness to devalue may depend on the length of the term in office of the government, as devaluation, which often is a necessary part of an adjustment program, is frequently perceived as failure. The ability to blame a predecessor for this will be a decreasing function of the length that the current government has been in power (Bird and Rowlands, 2001). We proxy this by the duration of the government (*office*) and the number of years that the party of the chief executive has been in office (*partyoffice*).

Political interests of its principal shareholders may be seen to influence decisions by the IMF. An 85 percent majority is required for the most important Fund decisions. Since voting power is—broadly speaking—allocated on the basis of economic size, the US (which controls 17.83 percent of the voting power in the IMF), as well as small coalitions of industrialized countries hold veto power in the Fund's decision making (Thacker, 1999). These countries may favor Fund programs with countries with which they have important economic relations—proxied by share of imports and exports from/to US in GDP (*tradeUS*). Rowlands (1995) notes that the Fund has been accused of being concerned excessively with interests of international lenders, especially after the 1982 debt crisis. We therefore include a variable reflecting expropriation risk (*exprisk*).

Bird and Rowlands (2000) also suggest that the IMF could prefer lending in general to countries that are more liberal—proxied by political rights (*polright*) and civil liberties (*civlib*)—and those with good governance—proxied by corruption indicator (*corrupt*), a rule of law indicator (*rulelaw*), an indicator for the risk of repudiation of government contracts (*repudiation*), and an indicator for the quality of the bureaucracy (*burqual*). The size of a country requesting support may also matter: larger countries—proxied by (lagged) relative size (*relsize*)—may more easily get support to the extent that the 'systemic' or 'contagion' risk of a balance of payments problems in these countries is higher than in smaller countries.

3. The model and the other data

In contrast to most previous research, we focus on the amount of credit provided by the IMF. We have two reasons for this choice. First, as follows from the literature review of the previous section, this issue has received scant attention so far. Second, it is interesting not just to know the circumstances that lead a country to seek IMF funds, but also to know the factors that determine the amount of IMF credit supplied. Data on the amount of outstanding IMF credit is readily available (see the Appendix). Our dependent variable (credit) is the increase in this stock, scaled by GDP. The stock of IMF credit is a non-stationary variable. Thus we use increases in the stock of credit, to ensure that repayments, which are probably determined by other factors than new loans, do not affect our results. The focus on credit relative to a GDP measure allows us to scale IMF credit by economic size of the recipient country, reducing the possible heteroskedasticity in the data. Since the access to IMF is in part based on a country's quota—and thus on a country's economic strength—, this seems to be in line with the institutional set-up, too.

We employ (variants) of the so-called Extreme Bounds Analysis (EBA) as suggested by Leamer (1983) and Levine and Renelt (1992) to examine which explanatory variables are robustly related to our dependent variable. To the best of our knowledge, this has never been done before in the literature on the determinants of IMF credit, although there are some very good reasons to apply this methodology.

The EBA has been widely used in the economic growth literature. The central difficulty in this research—which also applies to the research topic of the present paper—is that several different models may all seem reasonable given the data, but yield different conclusions about the parameters of interest. Indeed, a glance at the studies summarized in Appendix A1 illustrates this point. The results of these studies sometimes differ substantially, while most authors do not offer a careful sensitivity analysis to examine how robust their conclusions are. As pointed out by Temple (2000), presenting only the results of the model preferred by the author can be misleading.

The EBA can be exemplified as follows. Equations of the following general form are estimated:

$$Y = \alpha M + \beta F + \gamma Z + u \qquad (1)$$

where Y is the dependent variable; M is a vector of 'standard' explanatory variables; F is the variable of interest; Z is a vector of up to three (here we follow Levine and Renelt, 1992) possible additional explanatory variables, which according to the literature may be related to the dependent variable; and u is an error term. The extreme bounds test for variable F says that if the lower extreme bound for β—i.e. the lowest value for β minus two standard deviations—is negative, while the upper extreme bound for β—i.e. the highest value for β plus two standard deviations—is positive, the variable F is not robustly related to Y.

As argued by Temple (2000), it is rare in empirical research that we can say with certainty that some model dominates all other possibilities in all dimensions. In these circumstances, it makes sense to provide information about how sensitive the findings are to alternative modeling choices. Extreme bounds analysis provides a relatively simple means of doing exactly this. Still, the EBA has been criticized in the literature. Sala-i-Martin (1997a,b) argues that the test applied in the extreme bounds analysis poses too rigid a threshold in most cases. If the distribution of β has some positive and some negative support, then one is bound to find at least one regression for which the estimated coefficient changes sign if enough regressions are run. We will therefore not only report the extreme bounds, but also the percentage of the regressions in which the coefficient of the variable F is significantly different from zero at the 5 percent level. Moreover, instead of analyzing just the extreme bounds of the estimates of the coefficient of a particular variable, we follow Sala-i-Martin's (1997b) suggestion to analyze the entire distribution. We also report the unweighted parameter estimate of β and its standard deviation, as well as the unweighted cumulative distribution function (CDF).[7]

Another objection to EBA is that the initial partition of variables in the M and in the Z vector is likely to be rather arbitrary. Still, as pointed out by Temple (2000), there is no reason why standard model selection procedures (such as testing down from a general specification) cannot be used in advance to identify variables that seem

[7] Sala-i-Martin (1997a) proposes using the (integrated) likelihood to construct a weighted CDF. However, the varying number of observations in the regressions due to missing observations in some of the variables poses a problem. Sturm and De Haan (2001) show that as a result this goodness of fit measure may not be a good indicator of the probability that a model is the true model and the weights constructed in this way are not equivariant for linear transformations in the dependent variable. Hence,

to be particularly relevant. This is indeed what we have done. We started with 12 economic explanatory variables, which are all listed in Appendix A2. An extensive analysis of the data based on a general to specific approach yielded the variables that we selected for our M vector. These are: debt service scaled to exports (*debtserv*), international reserve holdings (corrected for the change in IMF credit) scaled to imports (*intreserv*) and (lagged) real GDP growth (*ggdp*). A heavy debt burden relative to exports increases countries' need for external finance to service that debt. Likewise, countries with relatively low levels of international reserves relative to imports will be less able to meet balance of payments difficulties through reserve use and hence will be more likely to request and receive IMF credit (Knight and Santaella, 1997). Also countries experiencing relatively weak growth in real GDP probably demand more credit (Dreher and Vaubel, 2000 and Bird and Rowlands, 2000): To capture this, we include the growth rate of real GDP. As there is a possible endogeneity problem with this variable, it enters with a one-period lag.

We first examine how robust this basic model is. Next, we check whether all other variables listed in Appendix A2 are robustly related to IMF credit. Apart from the political variables which were already discussed in the previous section, we have selected various economic variables which have been suggested in the literature as summarized in Appendix A1. The following economic variables are considered:

- log of 1+inflation (*infl*): Countries experiencing high inflation are more likely in need of IMF credit. However, the willingness of the IMF to provide funds may be lower in case of high inflation (Dreher and Vaubel, 2000).
- Percentage change of the nominal exchange rate (*xrate*): Countries faced with a speculative attack are more likely to turn to the IMF for assistance (Knight and Santaella, 1997).
- government budget deficit/GDP (*deficit*): Governments with high budget deficits are more likely to turn to the Fund (Przeworski and Vreeland, 2000). On the other hand, the Fund is more likely to enter into an arrangement with a country when its budget constraint is less binding (Vreeland, 1999).

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changing scales will result in rather different outcomes and conclusions. We therefore restrict our attention to the unweighted version.

- (lagged) income per capita (*gdpcap*): Low-income countries are more likely to seek Fund assistance.[8]
- current account balance/GDP (*curacc*): A country that has a balance of payments need for financial resources will be more likely to demand IMF credit.
- external debt/GDP (*debt*): A high debt ratio may not only lead to more demand for IMF credit, but also to more supply as a high debt ratio may give a country bargaining leverage over the IMF because of its importance for global financial stability (Strom, 1999). On the other hand, a high debt ratio may reduce the creditworthiness of the country concerned.
- monetary expansion (growth rate of M2; *gM2*): A high rate of monetary growth may indicate more need for funds, but may also decrease the Fund's willingness to supply credit.
- terms of trade (*gtot*): A worsening of a country's terms of trade is likely to weaken a country's external position, thereby increasing the likelihood that it will need to seek Fund assistance.
- investment/GDP (*inv*): A low ratio of investment to GDP may indicate limited access to international capital markets, thereby making it more likely that it requests Fund assistance (Knight and Santaella, 1997).

Like with some of the political variables, causality may be in the other direction. For instance, countries under an IMF program may pursue policies to reduce their inflation rate as part of the stabilization program. In that case IMF credit leads to lower inflation. To reduce possible simultaneity bias, all economic explanatory variables are lagged one year.

[8] Knight and Santaella (1997) mention two reasons for this. First, poor countries have limited access to private international capital markets. Second, they may need technical assistance to develop well-functioning institutions. (Some critics of the IMF would perhaps interpret a significant effect of an income variable as support for the claim that the IMF has become to much of an aid agency (Rowlands, 1995)).

4. Results

As explained in the previous section, we start by identifying a basic economic model using standard model selection procedures (general to specific). The exercise leads to a specification with the following explanatory variables for disbursed IMF credits in percent of GDP: debt service scaled to exports (*debtserv*), international reserve holdings scaled to imports (*intreserv*) and lagged real GDP growth (*ggdp*). These variables (or variables akin to these) are also present in most models of IMF lending behavior in the literature, indicating that the basic model selected here comes close to a consensus model (compare the summary in Table A1 in the appendix). The results presented in Table 1 are based on a data set including annual data for 128 IMF member countries over the period 1972 to 1998. The panel model estimated includes country and time dummies, a specification that is supported by the test statistics given in the lower panel of the table. The dependent variable measures positive changes in the stock of outstanding IMF credit in percent of GDP.[9]

Table 1. The basic model

Variable:	
debtserv	1.63 **
	(8.29)
intreserv	-0.43 **
	(-4.89)
ggdp(-1)	-1.57 **
	(-5.11)
No. observations	2205
No. countries	128
R^2 (adjusted)	0.21
Hausman test on random effects	14.70 **
LR test on individual effects	394.10 **
LR test on time effects	135.75 **
LR test on time and individual effects	501.80 **

Note: All variables have been corrected for time specific and country effects. T-Statistics are in brackets below coefficients. ** indicate significance at the 1 percent level, respectively.

[9] The results are very robust with regard to alternative specifications of the dependent variable. We comment on a number of robustness checks toward the end of this section.

The results indicate a strong positive impact of a high current debt burden on the magnitude of IMF credit received relative to GDP. This might indicate a demand effect, i.e. that countries burdened with high debt service are more inclined to approach the IMF for additional funds, but it could also be a proxy for a number of other factors otherwise absent from the basic model. For instance, the service due on the stock of a country's debt will also reflect past and present real shocks and their fiscal consequences. We will return to this interpretation below. A decrease in available international reserves signals pressure on the value of a national currency on the forex markets. Arguably, extending credit to member countries that experience balance-of-balance problems is part of the traditional IMF mission. A possible explanation of the negative correlation between IMF credit disbursement and real growth is that: countries suffering a severe real shock are more likely to turn to the IMF for help. However, real shocks might also lead to financial and exchange rate crises (Allen and Gale, 2000), triggering IMF support for member countries. The fiscal repercussions of these events might also be behind the impact of *debtserv* on IMF credit.

Table 2 shows that the results for the basic model are indeed very robust. All three explanatory variables have an unweighted CDF of 1—satisfying the criterion suggested by Sala-i-Martin—and are significant in all regressions underlying this CDF. Hence, even according to the very stringent EBA all three variables qualify as being robustly related to our dependent variable, the increase in IMF credits. Furthermore, the variables show an unweighted β coefficient close to the point estimates in Table 1.

Table 2. Extreme bounds analysis for the basic model

Variable	Lower bound	Upper bound	% of regressions with significant coefficient	Unweighted CDF	Unweighted β	Standard error
debtserv	0.18	2.78	100.00	1.00	1.61	0.22
intreserv	-1.02	-0.04	100.00	1.00	-0.51	0.11
ggdp(-1)	-3.70	-0.18	100.00	1.00	-1.52	0.39

Note: Results are based on 703 regressions.

Next we use the basic model to conduct a robustness analysis of a number of other economic, as well as some political-economic, variables that have been identified in the literature as having an influence on IMF lending practices. Table 3 presents the outcome of this exercise. If we follow Sala-i-Martin (1997a,b) and consider only variables with an unweighted CDF above 0.95 to be robustly related to IMF credit, a first result stemming from Table 3 is that most of these variables are not robustly related to IMF credit. The only economic variable with an unweighted CDF above 0.95 is investment. It has the 'correct' sign. Note, however, that the evidence on investment is rather mixed, as its coefficient is only significant in 63 percent of the regressions. On the basis of the value for CDF, the exchange rate variable is a borderline case.[10] However, even if one accepts it as a robust variable according to Sala-i-Martin's criterion, it is only significant in 36 percent of the regressions. Also note that both investment and the exchange rate variable are not considered to be robustly related to IMF credit according to the EBA criterion. Interestingly, a third economic variable, the terms of trade measure (*gtot*), while showing a significant (and 'correctly' signed) coefficient in 66 percent of the regressions, should according to the CDF not be considered to be robustly related to IMF credit.

The discussion of the political-economic literature in Section 2 suggests that a number of political variables could show a significant and robust influence on IMF credit disbursement. However, the only political variables that appear to be robustly related to IMF credit according to the CDF criterion are the number of years the chief executive has been in office (*office*), the quality of the bureaucracy (*burqual*), and the dummy variable indicating repressed political opposition within the ranks of the regime or opposition (*purges*),. In terms of the percentage of regressions in which the coefficients are significantly different from zero, the results for the first two political variables are somewhat less impressive (respectively 60 and 47 percent) than the economic variables in the basic model or bureaucratic quality. It is also important to note that, according to the strict EBA, neither of the three variables should be considered to be robustly related to IMF credit, as the upper and lower bound change signs.

[10] The unweighted CDF of the exchange rate variable (*xrate*(-1)) equals 0.945.

Table 3. Extreme bounds analysis for added variables

Variable	Lower bound	Upper bound	% of regressions with significant coefficient	Unweighted CDF	Unweighted β	Standard error
Economic Variables:						
infl(-1)	-0.0054	0.0027	0.14	0.64	0.0002	0.0006
xrate(-1)	-0.0594	0.2540	36.42	0.95	0.0558	0.0317
deficit(-1)	-0.0238	0.0298	0.00	0.64	0.0028	0.0068
gdpcap(-1)	-0.8848	0.6979	0.71	0.61	-0.0601	0.1586
curacc(-1)	-0.0228	0.0095	10.95	0.83	-0.0044	0.0036
debt(-1)	-0.0017	0.0040	29.45	0.80	0.0008	0.0005
gm2(-1)	-0.0002	0.0002	0.00	0.72	0.0000	0.0000
gtot(-1)	-0.0099	0.0074	66.15	0.74	-0.0021	0.0016
inv(-1)	-0.0324	0.0151	63.44	0.95	-0.0099	0.0047
Political Variables:						
national	-0.4348	0.7649	0.00	0.72	0.1010	0.1536
elecex(-1)	-0.2319	0.2359	0.00	0.59	0.0175	0.0723
elecex(+1)	-0.1771	0.2544	0.00	0.73	0.0453	0.0715
eleceg(-1)	-0.1296	0.2489	26.03	0.86	0.0731	0.0542
eleceg(+1)	-0.1219	0.2140	0.71	0.79	0.0460	0.0541
non-unit	-0.1882	0.2508	0.00	0.69	0.0339	0.0658
assas	-0.0604	0.0735	0.00	0.69	0.0100	0.0189
revol	-0.1416	0.3186	28.02	0.90	0.0799	0.0524
gueril	-0.2629	0.1403	0.00	0.69	-0.0375	0.0700
ethnic	-0.1287	0.1808	21.48	0.92	0.0597	0.0381
crises(-1)	-0.3600	0.1241	28.88	0.79	-0.0729	0.0624
purges	-0.1101	0.5160	60.17	0.98	0.1709	0.0845
govchange	-0.2575	0.3714	0.00	0.60	0.0211	0.0793
demon(-1)	-0.0409	0.0540	0.00	0.76	0.0105	0.0146
strikes(-1)	-0.0731	0.1841	46.23	0.91	0.0621	0.0383
riots(-1)	-0.0247	0.0656	0.00	0.88	0.0182	0.0152
excomp	-0.5171	0.3969	3.13	0.63	-0.0269	0.0789
military	-0.4096	0.2108	30.01	0.90	-0.1174	0.0777
office	-0.0270	0.0058	46.80	0.95	-0.0082	0.0043
partyoffice	-0.0199	0.0194	0.71	0.53	-0.0005	0.0044
tradeus	-0.0139	0.0145	0.00	0.68	-0.0018	0.0038
exprisk	-0.1354	0.0817	0.00	0.77	-0.0219	0.0278
polright	-0.0885	0.0834	0.00	0.59	-0.0045	0.0211
civlib	-0.1136	0.0955	0.00	0.56	-0.0042	0.0266
corrupt	-0.1972	0.1588	0.00	0.76	-0.0347	0.0444
rulelaw	-0.2061	0.1134	2.84	0.82	-0.0439	0.0407
repudiation	-0.1065	0.0825	0.00	0.73	-0.0173	0.0252
burqual	-0.3554	0.1781	91.47	0.97	-0.1199	0.0523
relsize(-1)	-1.0762	0.6183	6.69	0.74	-0.2057	0.2256

Notes: Results are based on 666 models.

The negative coefficient for *office* is in line with the argument put forward by Bird and Rowlands (2001). The result lends some support to the view that new governments could be more likely than old governments to seek IMF resources. The robust positive relation of *purges* with IMF credit disbursement is somewhat more difficult to interpret. A possible explanation is that there is an increase in credit flows in the wake of political crises. The positive impact of (one-period-lagged) *strikes*—with a CDF of still 0.91—on IMF credit points in a similar direction. Interestingly, the findings in Table 3 also indicate a negative relationship between IMF credit and *burqual*, which contrasts the view of Bird and Rowlands (2001). A conceivable interpretation is that higher bureaucratic quality of government lowers the likelihood of financial or economic crises and thus of a need for IMF credit.[11]

To check the robustness of these results even further we have experimented with different variants of the dependent variable and the base model. One variant controls for the fact that drawings on the first 25 percent of countries' quotas are free of the conditionality that is attached to other IMF lending. In another specification we have used the change (instead of only the positive change) in the outstanding stock of IMF credits as dependent variable. In a third check we included the lagged dependent variable in the base model. Finally, to correct for potential cyclical element introduced in the dependent variable by scaling it by GDP, we scaled it by trend GDP, which we have constructed using the Hodrick-Prescott filter. Our conclusions are not affected by any of these changes to the model.[12]

5. Concluding comments

In this paper we have systematically analyzed which economic and political variables affect credit supplied by the IMF. In contrast to most previous research we focus on the amount of credit provided by the IMF. We have two reasons for this choice. First, this issue has received scant attention so far. Second, it is interesting not just to know

[11] Table 3 suggests that *military*, the presence of a military regime, could have a negative influence on IMF credit, indicating perhaps smaller demand for IMF support by non-democratic regimes as suggested e.g. by Edwards and Santella (1993). The CDF is 0.90. Note, however, that only some 30 percent of regressions produce a significant coefficient and that the variable is disqualified by EBA.

the circumstances that lead a country to seek IMF funds, but also to know the factors that determine the amount of IMF credit supplied. On the basis of a panel model for 128 countries over the period 1972-1998, we find that debt service scaled to exports, international reserve holdings scaled to imports, (lagged) economic growth, and investment are robustly related to IMF credit supply. The only political variables which appear to be robustly related to IMF credit supply are a dummy variable indicating the repression of political opposition within the ranks of the regime or opposition, the number of years the chief executive has been in office, and the quality of the bureaucracy. While these findings give some support to the notion that political-economic variables may play a (limited) role in the flow of IMF credit, they also suggest that more theoretical groundwork on the determinants of the demand and supply of IMF resources might be helpful to guide future econometric research. This is also true for a more disaggregated analysis of IMF credit flows by credit facilities or country groups.

[12] All additional results are available on request.

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Appendix A1: Summary of studies since 1990

Study:	Type of model:	Economic Variables included:	Effect:	Political Variables included:	Effect:
Joyce (1992)	logit analysis of participation in IMF program; 45 countries; 1980-84	Growth CB holdings of dom. assets Gov. expenditure/GDP Current account/exports Inflation Reserves/export GDP per capita Private loans/imports Debt service/exports	+ + - 0 - - 0 0	No political variables included	
Edwards and Santaella (1993)	probit analysis of participation in IMF program; 48 countries; 1948-71	Relative GDP per capita Change in real exchange rate Change in current account deficit net foreign assets ratio	- 0 0 -	political strikes, riots, demonstrations political assassinations, attacks, deaths frequency of coup attempts dictatorial regime ideological indicator	0 0 + - 0
Conway (1994)	tobit/probit analysis of participation in IMF program; 74 countries; 1976-86	Reserves/imports Contractual date of expiration of IMF program Growth rate GNP Current account/GNP World real interest rate Terms of trade International debt Share of output from agriculture	- + - + - - + 0	No political variables included	
Rowlands (1995)	Probit analysis of signing of IMF agreement 109 countries; 1973-89	Per capita GDP relative to US Population Dummy for eligible for SAF/ESAF Debt service/exports (official and private) Debt (official and private) (Change to previous year's) Reserves/imports Change Export earnings Payments restrictions Inflation (Growth rate of) GDP LIBOR Debt rescheduling (official and private) Payment arrears	0 0 0 + 0 - - + 0 0 - + 0	Political freedom Unrest/conflict dummy Concessional loans (soc. orientation) US assistance Industrial country's export Share in world imports Voting power in IMF Regional dummies Dummy previous IMF program	0 0 0 0 - + 0 + +
Bird (1995)	Drawings on IMF; 40 countries; 1980-85	Debt service ratio Inflation GDP per capita	0 + -	No political variables included	

Study:	Type of model:	Economic Variables included:	Effect:	Political Variables included:	Effect:
		Real imports Balance of payment/(exports+imports) New private loans/imports Reserves/imports (reserves)	+ 0 + 0 (+)		
Knight and Santaella (1997) [a)]	probit model for approval of IMF arrangement; 91 countries; 1973-91	Reserves/imports Current account/GDP Inflation Debt service/exports External debt/GDP Non-Fund financing/imports Growth GDP per capita Growth of terms of trade growth export markets investment/GDP balance of payments/GDP real effective exchange rate GDP per capita previous fund arrangement nominal depreciation >5% change in gov. revenues/GDP change in gov. expenditures/GDP growth in real domestic credit arrears to IMF IMF arrangement	- 0 0 + 0 0 - 0 0 - 0 - - + + + - 0 0 0	No political variables included	
Thacker (1999)	logit analysis of participation in IMF program; 78 countries; 1985-94	(change in) balance of payment (change in) current account (change in) debt/GNP (change in) debt service/GNP (change in) reserves/debt GNP per capita default dummy money supply (growth) budget deficit openness	- 0 0 + - - + 0 0 0	US exports to a country US direct investment in a country index for political agreement with US movement in political agreement energy production democracy indicators	0 0 +/0 + 0 0
Vreeland (1999)	probit model for participation in IMF program	Foreign reserves/imports Debt service/GDP Investment/GDP Budget deficit/GDP	- + - -	Years under IMF program Number of other countries under IMF program Lagged election	+ +/- +

Study:	Type of model:	Economic Variables included:	Effect:	Political Variables included:	Effect:
		Balance of payments/GDP (in model for IMF willingness to start program)	-	Dictatorial regime	+
Bird and Rowlands (2000)	probit model; 80 countries; 1965-95	GNP per capita GDP growth reserves/imports current account/GDP change in reserves real exchange rate debt service ratio change in debt service debt/GDP change private debt arrears/debt past reschedulings real LIBOR change in real LIBOR months to sign	- - - 0 - + + 0 - + + + 0 + -	exports US/France communist links level freedom change freedom new government coups quota review failed agreements IMF liquidity GDP	0 - 0 + 0 + 0 + 0 0
Przeworksi and Vreeland (2000) [b)]	probit model; 135 countries; 1951-90	reserves/import budget deficit/GDP debt service/GDP investment/GDP real balance of payments	- - + - -	years under IMF program other countries in IMF program election in previous year dictatorship	+ + + +
Dreher and Vaubel (2000)	new credit by IMF/GDP; 106 countries; 1971-97	monetary expansion budget deficit/GDP government consumption/GDP real GDP growth inflation reserves/import foreign short-term private debt/foreign debt FDI/GDP current account/GDP LIBOR share exports to other IMF supported countries war dummy IMF quota review dummy	- - 0 - - - + - - + + - +	pre- and post-election dummies democratic regime dummy	+ -
Vreeland (2001)	Probit model for participation in IMF	GDP per capita Foreign reserves/imports	- -	(log of) number of veto players type of democratic executive-legislative	+ +

Study:	Type of model:	Economic Variables included:	Effect:	Political Variables included:	Effect:
	program 179 countries; 1975-96	Current account/GDP Debt service/GDP Investment/GDP Budget deficit/GDP Balance of payments/GDP interacted with Size (in model for IMF willingness to start program)	0 + - 0 -	relationship number of other countries under IMF program (in model for IMF willingness to start program)	-
Barro and Lee (2001)	Probit/tobit models for approval of short-term stabilization program and participation in IMF program 131 countries; 1975-99 using 5 years intervals	Currency crisis Banking crisis GDP per capita Square of GDP per capita Foreign reserves/imports Growth rate of GDP	+ + + - - -	share of IMF quotas country's nationals among IMF staff fraction of votes cast in UN along with US	+ + +

a) The results for the bivariate probit model are shown.
b) The results for the determinants of entering an IMF program are shown.

Appendix A2. List of variables and their sources

Variable:	Sign:	Description:	Source:
IncrCredIMF		positive change in use of IMF credit (DOD, current US$) (% of GDP)	World Bank 2000 CD-Rom
Debtserv	(+)	total debt service (% of exports of goods and services)	World Bank 2000 CD-Rom
Intreserv	(-)	(gross international reserves (includes gold, current US$) - change in use of IMF credit (DOD, current US$)) / imports of goods and services (current US$)	World Bank 2000 CD-Rom
Xrate	(+)	growth rate of official exchange rate (LCU per US$, period average)	World Bank 2000 CD-Rom
Infl	(?)	log (1+inflation (consumer prices))	World Bank 2000 CD-Rom
Ggdp	(-)	growth of real GDP	World Bank 2000 CD-Rom
Deficit	(?)	overall budget deficit, including grants (% of GDP)	World Bank 2000 CD-Rom
Gdpcap	(-)	log (GDP at market prices (constant 1995 US$) / population)	World Bank 2000 CD-Rom
Curacc	(-)	current account balance (% of GDP)	World Bank 2000 CD-Rom
Debt	(?)	external debt, total (DOD, current US$) / GDP at market prices (current US$)	World Bank 2000 CD-Rom
Gm2	(?)	money and quasi money growth (annual %)	World Bank 2000 CD-Rom
Gtot	(-)	growth rate of terms of trade	World Bank 2000 CD-Rom
Inv	(-)	gross domestic fixed investment (% of GDP)	World Bank 2000 CD-Rom
National	(-)	dummy for nationalistic governments	World Bank database of political institutions, version 2
Elecex	(+)	dummy for executive election-years	World Bank database of political institutions, version 2
Eleceg	(+)	dummy for legislative election-years	World Bank database of political institutions, version 2
Non-unit	(+)	dummy for non-unitary governments (Index of Political Cohesion >= 1)	World Bank database of political institutions, version 2
Assas	(+)	number of politically motivated murders or attempted murders of high government officials or politicians	Banks' International Archive
Revol	(+)	number of revolutions (illegal or forced changes in the top governmental elite, attempts at such changes, or (un)successful armed rebellions)	Banks' International Archive
Gueril	(+)	guerilla warfare: any armed activity, sabotage, or bombings aimed at the overthrow of the present regime	Banks' International Archive
Ethnic	(+)	presence of ethnic tensions	International Country Risk Guide (ICRG) Data
Crises	(+)	number of major government crises that threaten to bring the downfall of the present regime	Banks' International Archive
Purges	(+)	number of systematic repressions (or eliminations) by jailing or execution of political opposition within the ranks of the regime or the opposition	Banks' International Archive

Variable:	Sign:	Description:	Source:
Govchange	(+)	percentage of veto players who drop from the government	World Bank database of political institutions, version 2
Demon	(+)	number of peaceful anti-government demonstrations	Banks' International Archive
Strikes	(+)	number of strikes (1,000 or more workers) aimed at national government policies or authority	Banks' International Archive
Riots	(+)	number of violent demonstrations or clashes of more than 100 citizens	Banks' International Archive
Excomp	(?)	measure of dictatorship (executive index of electoral competitiveness <= 2)	World Bank database of political institutions, version 2
Military	(?)	dummy if chief executive is a military officer	World Bank database of political institutions, version 2
Office	(-)	number of years the chief executive has been in office	World Bank database of political institutions, version 2
Partyoffice	(-)	number of year party of chief executive has been in office	World Bank database of political institutions, version 2
Tradeus	(+)	trade relations with US (export to and import from US / GDP)	OECD ICTS database, World Bank 2000 CD-Rom
Exprisk	(+)	expropriation risk	International Country Risk Guide (ICRG) Data
Polright	(+)	political rights index	Freedom House
Civlib	(+)	civil liberties index	Freedom House
Corrupt	(-)	indicator for corruption in government	International Country Risk Guide (ICRG) Data
Rulelaw	(+)	rule of law (law and order tradition) indicator	International Country Risk Guide (ICRG) Data
Repudiation	(-)	indicator for repudiation risk of government contracts	International Country Risk Guide (ICRG) Data
Burqual	(+)	indicator for bureaucratic quality	International Country Risk Guide (ICRG) Data
Relsize	(+)	Relative size of country (GDP / World GDP)	World Bank 2000 CD-Rom

Note: The expected sign is shown in parentheses. See main text for further explanation.