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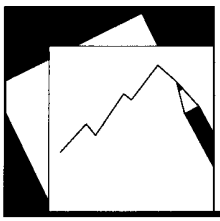

IMF Working Paper

IMF Drawing Programs: Participation Determinants and Forecasting

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IMF Drawing Programs: Participation Determinants and Forecasting

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Abstract

This paper studies the factors that have influenced countries' participation in IMF drawing programs. IMF drawing programs are defined as the period of a Stand-By Arrangement or an Extended Fund Facilities program during which a country borrows from the Fund. Since this definition excludes precautionary arrangements and periods during which the program went off-track, it provides a closer link to the factors that have influenced the evolution of IMF credit outstanding. The analysis uses quarterly data during the period 1982–2005 and focuses on developing, non-PRGF eligible countries. Country-specific variables—net international reserves and GDP growth—together with a global factor—world GDP growth—are found to be among the most significant determinants of countries' participation in IMF drawing programs. The importance of the global factor is not uniform during the period reviewed. The influence of world GDP growth seems to have been significant during the 1980s debt crises but not since the Mexican crisis in 1994. An out-of-sample forecast evaluation of the period 2004–5 reveals that the model has some predictive power.

JEL Classification Numbers: F33, F34

Keywords: IMF, IMF programs, Use of Fund Resources

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I. Introduction

Understanding why countries borrow from the IMF is an important step towards determining the level of liquidity and credit capacity the IMF requires to help its member countries. Since participation in IMF programs is a joint decision of the IMF and an IMF member, these joint decisions to establish a new program and to continue drawing under an existing arrangement are important to the evolution of IMF credit outstanding, and they are the focus of this paper.

Most of the literature on IMF programs have sought to explain the determinants of participation in IMF programs either as an end objective (e.g. Joyce 1992, Knight and Santaella 1997, Bird and Rowlands 2001), or as an intermediate step to evaluate the impact of IMF programs in terms of growth, exchange rate stability, and/or balance of payments (e.g. Conway 1994, Przeworki and Vreeland 2000, Barro and Lee 2005, etc.). More recently, Elekdag (2006) and Ghosh et al (2007) focus on the evolution of IMF credit outstanding through the analysis of the determinants of the establishment of new IMF programs.[2] This paper broadly follows this work though departing from this existing literature, the paper studies the period of Stand By Arrangements (SBA) and Extended Fund Facilities (EFF) programs when countries are drawing resources from the Fund. This IMF "drawing" program concept provides a closer link to the evolution of IMF credit outstanding because it does not include the period when programs were precautionary or went off-track after a few purchases, or programs where the first purchase was made long after the approval.[3,4] The distinction between IMF programs and IMF drawing programs is relevant, especially, during recent years, when the proportion of precautionary programs has increased. On a quarterly average, drawing programs were 58 percent of total programs during the period 1980–2005, as compared to 44 percent since 2000.

Directly estimating the level of IMF credit outstanding by country, as a simple function of the determinants of participation, is complicated due to IMF access policies (Knight and Santaella 1997). Members' access to IMF resources are linked to their quotas in the IMF—capital subscription based on members' relative size in the world economy. There is a bi-modal distribution in IMF members' borrowing, with a large cluster of cases centered below the access

[2] Ghosh et al (2007) also performed, using annual data, an aggregate—non country specific—study through a cointegration analysis of the evolution of IMF credit outstanding in the period 1980–2005.

[3]The drawing program concept is sometimes used to refer to non precautionary programs (e.g. Precautionary Arrangements-Purposes and Performance, IMF, March 23, 2006). Nevertheless, in the current paper, the drawing program definition is consistent with the fact that countries cannot draw resources under off-track programs, which are programs where the observance of performance criteria and the completion of a program review are not being achieved. Under precautionary programs, a member country indicates that it does not intend to utilize the undrawn available credit. However, this is not a binding commitment and the country can later reverse its decision and draw the resources.

[4] SBA and EFF are the two main IMF programs in terms of lending resources and they are designed to temporarily make available the general resources of the Fund to countries with balance of payment difficulties. The Supplemental Reserve Facility is not included by itself in this paper because it needs to be associated with a SBA or EFF. Currently, Compensatory Financing Facility and Emergency Assistant are the other two arrangements which use general resources—capital subscribed by members—but they are far less important in term of used resources. For more information see Financial Organization and Operations of the IMF, Pamphlet Series No 45, 2001.

limits and another cluster above the access limits.[5] Thus, in line with most of the previous empirical studies on estimating the characteristics of Fund arrangements (e.g. Joyce 1992, Conway 1994, Knight and Santaella 1997, Przeworski and Vreeland 2000, Bird and Rowlands 2001, Elekdag 2006, etc.), this paper models participation in an IMF drawing program as a binary choice. More precisely, in this paper, a program period is defined as a drawing program from its approval until the last disbursement under the program, with the caveat that the timing of the first disbursement is taken instead of the approval if the first disbursement was more than two quarters after the approval or if the program was precautionary upon approval.

In considering the characteristics of the countries that have participated in IMF programs, we would need to take into account the fact that these may have changed over time. By the 1980s, with the globalization of financial markets, most developed economies were able to finance their external obligations with private flows and without participating in IMF programs (Boughton 2004). Also, especially since 1987 with the establishment of concessional financial facilities at the Fund with the Fund as a Trustee, low-income countries have usually first tapped concessional programs such as the Poverty Reduction and Growth Facility (PRGF). Recognizing these developments, this paper focuses on borrowing by emerging markets defined as developing, non-PRGF eligible countries at a quarterly frequency during 1982–2005. Emerging markets accounted for more than 86 percent of IMF credit outstanding at the end of each quarter since 1982, and more than 95 percent since the Mexican crisis in 1994. The advantage of using quarterly frequency data is that changes in the macroeconomic environment of countries are often sudden, and hence, they are better captured by higher frequency observations than the annual frequency typically used in the literature on IMF programs.

This paper finds that some country-specific factors, such as net international reserves and GDP growth, together with a global factor—world GDP growth—are the most significant determinants of why countries borrow from the Fund. However, the importance of world GDP growth is not uniform during the period reviewed because it seems to have mattered during the 1980s debt crises but not since the 1994 Mexican crisis. Other variables, such as the external current account and inflation, are significant factors determining participation in new drawing programs, but are less significant over the life of drawing programs, highlighting the adverse economic conditions countries may face at the inception of a Fund program. The out-of-sample forecast evaluation of the period 2004–05 reveals that the model has some predictive power for capturing specific countries' programs. It can capture three to four of the five drawing programs of the period.

The reminder of the paper is organized as follows. The evolution of IMF credit and the number and characteristics of IMF drawing programs are analyzed in Section II. Section III presents a formal framework to study the joint determinants of drawing programs, together with a literature review of the main related findings. The empirical estimation results, forecasting properties of the models, and robustness tests are presented in Sections IV and V, respectively.

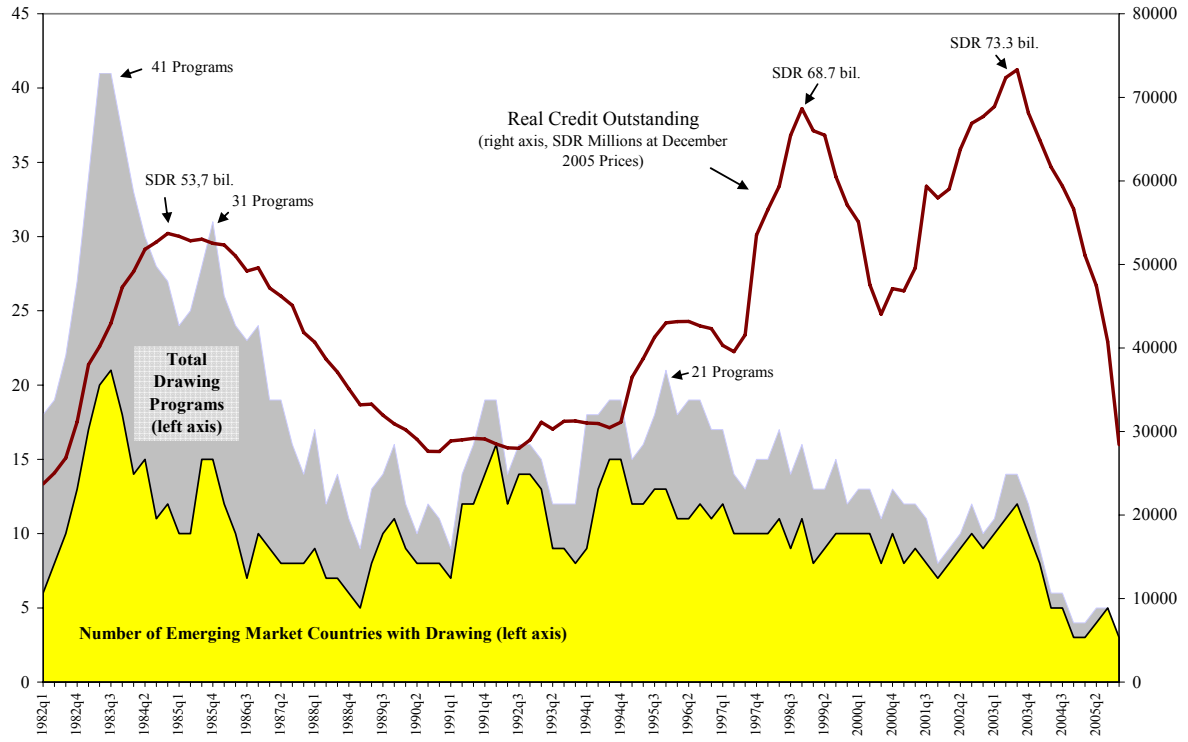
[5] The IMF has established policies that govern the use of its resources by members and define the maximum amounts that can be borrowed from the IMF by member countries under different circumstances. Fund access limits and exceptional access policies have changed over time and they are described in "Review of Access Policy in the Credit Tranches, the Extended Fund Facility and the Poverty Reduction and Growth Facility, and Exceptional Access Policy", IMF, March 14, 2005.

The final section concludes and discusses the implications for future work.

II. Evolution of Fund Credit and Country Participation

The evolution of real IMF credit outstanding and the number of drawing programs from 1982 to 2005 based on quarterly data is presented in Figure 1. IMF real credit outstanding is measured as nominal non-concessional IMF credit outstanding deflated by CPI inflation of major industrial countries—the countries whose currencies compose the SDR basket at the IMF.[6] IMF credit outstanding exhibits cyclical behavior with peaks in lending during major emerging market crises. The four most noticeable peaks in lending correspond to the 1980s debt crisis, the 1994 Mexican crisis, the 1997 Asian crises, and the most recent crises in Argentina, Turkey and Brazil. Real IMF lending during the 1980s debt crisis was larger than during the 1994 Mexican crisis but just below the most recent credit outstanding peaks. Interestingly, even though the total number of drawing programs increases during peaks in earlier years, the number of drawing programs is substantially lower during recent peaks. Hence, high levels of real credit outstanding do not necessarily correspond to a large number of drawing programs throughout the period. Countries with drawing programs have borrowed more during the recent crises in terms of both their quota and their GDP. For example, while Korea borrowed about 480 percent of its quota or 1.6 percent of its GDP in 1983, Korea borrowed around 1700 percent of its quota or 5.2 percent of its GDP in 1998 (see also figures C.1 and C.2 in Appendix C for other countries figures).

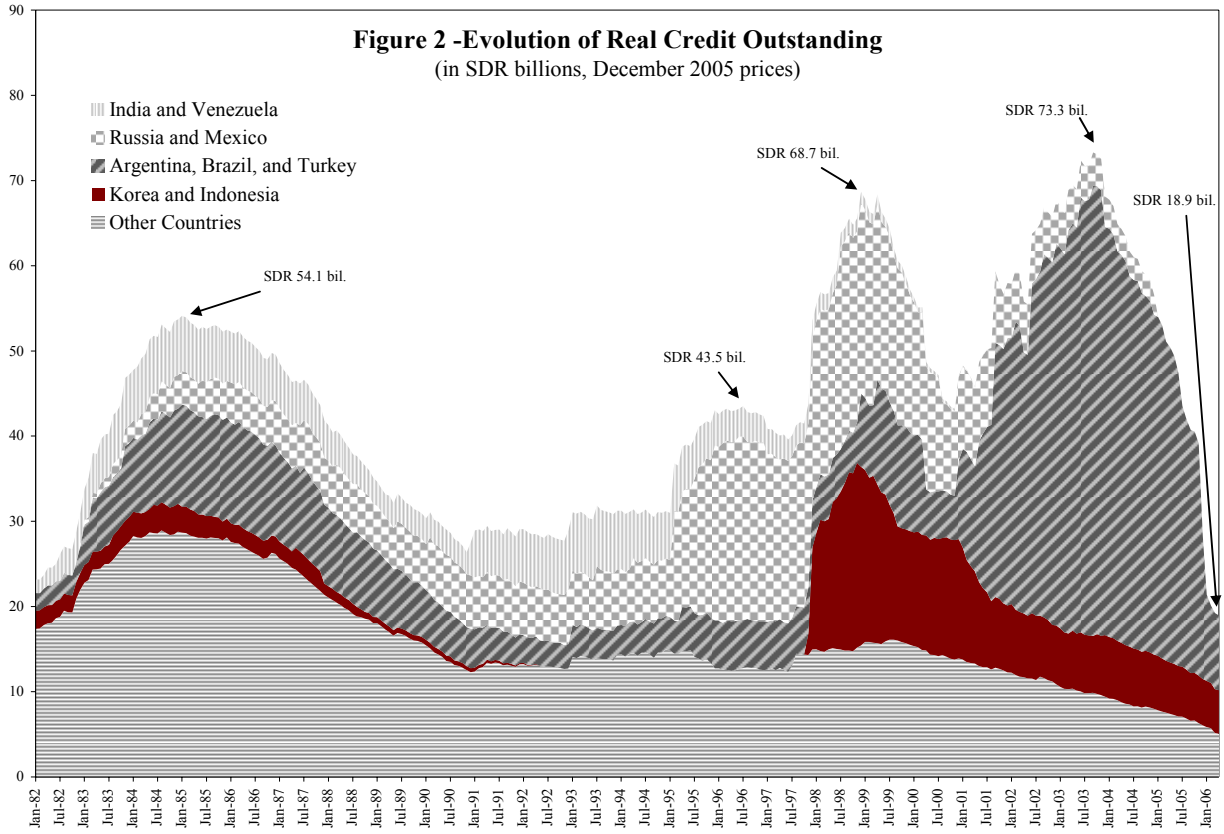
Figure 1 - Number of Drawing Programs and Real Credit Outstanding



[6] See Appendix B for a description of the procedure used to deflate the nominal IMF credit outstanding series. The use of real credit outstanding, instead of nominal figures, highlights the size of Fund lending in earlier periods.

The relationship between the total number of drawing programs and the number of emerging market countries drawing programs is also interesting and two points are worth highlighting. First, the increase in the proportion of emerging market countries with drawing programs in the total number of countries with drawing programs captures the sharp expansion of the volume of concessional finance since the beginning of 1987, reflecting the evolution in the IMF's mandate. Second, the increase of drawing programs in the early 1990s corresponds to the period when eastern European and former members of the Soviet Union joined the IMF and had, in most cases, Fund arrangements.

The timing and the size of the drawing programs for selected countries are displayed in Figure 2. It includes member countries that had at least 10 percent of credit outstanding during any quarter of the sample.[7] The figure highlights that a small number of countries have driven the evolution of credit outstanding, especially since the Tequila crisis. Second, it shows that most countries had drawing programs at the same time during the 1980s, and only a small and different set of these countries have borrowed large amounts during most recent peaks: Mexico and Russia in 1996, Korea, Indonesia, and to some degree also Russia, in 1999, and finally, Argentina, Brazil, and Turkey in 2003.



[7] By construction, an increase in the level of credit outstanding of a country is necessarily associated with a drawing program in the figure.

To summarize, IMF credit outstanding is volatile and its peaks usually coincide with country crises.[8,9] This highlights the lender of last resort role of the IMF. In recent years, most of IMF credit outstanding has been driven by a few countries. These factors have increased the need for a better understanding of the determinants of the participation in IMF drawing programs.

III. Joint Determinants of Country Participation

As described by Mussa and Savastano (1999), a typical IMF program usually begins with an explicit (not necessarily written) request from a member, which is followed by a blueprint of a program prepared by the IMF staff. Then, the key elements of the potential program are negotiated between the member's authorities and the IMF staff, and when an agreement is reached, the arrangement has to be cleared by IMF management and then approved by the IMF Executive Board. All of these steps highlight the joint decision nature of a program: the country's desire to seek an arrangement and the Fund's willingness to approve one are both necessary components. A similar joint decision process is followed during the life of the program, with the amounts that are finally drawn during the program period determined in this context. The IMF makes resources available in installments over the period of an arrangement, typically quarterly, subject to the observance of performance criteria and the completion of a program review. After a decision is taken by the IMF Board to provide financing, the country has to decide whether to draw them or not.

Most of the literature on IMF programs has studied, through a binary choice model, either the determinants of participation in IMF programs (e.g. Joyce 1992, Conway 1994, Vreeland 2004), or the determinants of program approval in a given year (e.g. Knight and Santaella 1997, Przeworki and Vreeland 2000, Bird and Rowlands 2001, Barro and Lee 2005, Elekdag 2006). In general, the literature usually includes, as determinants, country-specific economic variables (e.g. reserves, current account position, GDP growth, external debt, real exchange overvaluation, public deficit), global economic variables (e.g. world GDP, real world interest rates), and, more recently, political and institutional variables (e.g. political proximity to the US and Europe, member country quota in the IMF). Nevertheless, the sample of countries, period of coverage, types of IMF arrangements included (e.g. SBA, EFF, and/or PRGF) are not consistent across studies. Hence, it is not surprising that some results differ among studies.

This section presents a formal framework for the analysis of the joint determinants of

[8] It is worthwhile to highlight that, even though IMF credit outstanding peaks seem to occur around different countries' currency crises, using the currency crises literature to directly estimate the level of IMF credit outstanding has some important shortcomings. On the one hand, not all countries have engaged in IMF programs during a currency crisis (e.g. Malaysia during the Asian crises). On the other hand, there are countries that have engaged in drawing programs even though they are usually not classified as having a currency crisis during that period. Moreover, in this regard, the modeling of IMF programs, including drawing programs, has an important advantage. There is a precise definition of the event under study: either you have a program or you do not. The definition of a currency crisis is much more abstract and there is no consensus on it in the currency crisis literature.

[9] The other variable that affects the level of credit outstanding is the pace at which countries repay IMF arrangements. Countries have recently made significant advanced repayments ahead of schedule. This could also explain the higher volatility during the 1990s.

participation in both IMF drawing programs and the beginning of a new IMF drawing program, together with a short description of the data. Although this paper's dependent variables are different from those in the literature, the reasons why countries might participate in Fund-supported drawing programs are very similar. The main difference is that in this paper we exclude cases where countries do not need the IMF resources but require only the conditionality or the IMF macroeconomic policies "approval" by itself. For example, an IMF agreement may serve other purposes, such as enabling a government to push through policies that otherwise would have been rejected without IMF support (Przeworki and Vreeland 2000), triggering international donors' financing, or/and providing credibility to markets. Programs without drawings, such as precautionary programs, could be used in this sense but we are not including them since they do not have a direct relationship with the actual level of credit outstanding, though they do represent a contingent claim on Fund resources.

III.1. Determinants of Participation in IMF Drawing Programs

Knight and Santaella (1997) conclude that a univariate probit model, which can be interpreted as the reduced form of a supply-demand model, produces superior results. Specifically, it is more sensitive for predicting the approval of a financial arrangement than an alternative bivariate probit model which takes into account the joint supply and demand factors independently. Following Knight and Santaella (1997), we specify the joint determinants of participation in IMF drawing programs as the following univariate probit model:

$$I_{it}^{*} = \alpha + \beta X_{i,t-1} + \gamma Y_{i,t-1} + \delta Z_{t} + u_{i,t},$$

$$I_{i,t} = 1 \text{ if } I_{i,t}^{*} > 0,$$
$$I_{i,t} = 0 \text{ if } I_{i,t}^{*} \leq 0.$$

where $I_{i,t}$ equals one if the country *i* has a drawing program at time *t* and equals zero otherwise. The vectors X, Y, and Z include country-specific variables, political and institutional variables, and global variables, respectively. The country-specific variables and political and institutional variables enter with a lag in order to avoid endogeneity problems.[10]

Following the literature and data availability, three country specific domestic variables are included. First, the country's *real GDP growth* is considered. Countries experiencing slow or negative real growth will be more likely to borrow due to lower government revenues, and thus, a negative sign is expected. In the literature, Knight and Santaella (1997) and Barro and Lee (2005) find real GDP per capita growth significant and with the expected negative coefficient, even though Bird and Rowlands (2001) do not find this variable significant. Second, a measure of *CPI inflation* is included. A positive sign is expected because an increase in inflation could show a deterioration of economic performance, raising the need for economic assistance.

[10] It is worthwhile to highlight that both country-specific and global flow variables (e.g. GDP growth, fiscal surplus, inflation, etc) are measured on annual basis (last 4 quarters) in order to also capture the average environment during the joint decision process that might end or not in a drawing program in each quarter.

Nevertheless, the literature does not find inflation significant, e.g. Conway (1994) and Knight and Santaella (1997). Third, the *fiscal government budget surplus (as a percentage of GDP)* is incorporated. Its expected sign is ambiguous because, on the one hand, a higher deficit could likely increase the government's need for a drawing program, and, on the other hand, sometimes fiscal policy measures are often taken as "prior actions" before the arrangement is approved by the Fund (Mussa and Savastano 1999). Vreeland's (2004) probit estimation finds a positive but not significant coefficient.

Additionally, three other country-specific variables related to the external sector are included in the analysis. First, a measure of the *external current account balance (as proportion of GDP)* is considered. As described in the IMF Articles of Agreement (Article I), one of the main objectives of the Fund is to assist member countries with balance of payment problems. Hence, a negative sign is expected because a higher current account deficit may increase the probability of an IMF drawing program. However, Bird (2003) argues that, while countries turning to the Fund out of necessity have a balance of payment need, a current account deficit does not provide sufficient motivation for borrowing from the Fund. Second, *net international reserves (as a proportion of months of imports)* are included given that reserves offer countries buffers against unexpected events. A higher reserve to import ratio gives more adjustment time without the need for IMF assistance for a country facing external adjustments problems. There is a consensus regarding this variable across studies (see Conway 1994, and Knight and Santaella 1997). Finally, a measure of *real effective exchange rate* is introduced. An overvaluation of a country's real effective exchange rate is likely to weaken its external position, increasing the likelihood that it will need to seek Fund assistance. Bird and Rowland (2001) find a positive and significant coefficient. However, Knight and Santaella (1997) find a negative significant coefficient for the real effective exchange rate and associate this finding with changes in the underlying real equilibrium exchange rate. For example, terms of trade shocks or sudden capital reversals might decrease the equilibrium level of the real exchange rate, driving the real exchange rate to lower levels.

Among the political and institutional variables, we include *past programs* and two IMF institutional variables, *member country quotas* and *IMF liquidity*. The expected sign of a *past program* in the last two years is positive, in the sense that countries that have had Fund arrangements in the past will be more likely to enter into a new Fund arrangement. Bird and Rowland (2001) consider this variable consistent with a political threshold model where having once met the political cost of turning to the Fund, the marginal cost of further referrals falls. Knight and Santaella (1997) associate a past program variable with the country's greater familiarity with the Fund's operating procedures after they have negotiated and implemented an adjustment program. Additionally, in our case, this variable also captures the effect of precautionary program in possible drawings since the variable past programs includes any type of SBA/EFF program. A country with a precautionary program has the option to start drawing the agreed undrawn balance under the program. The first institutional variable is *IMF liquidity (one minus credit outstanding over industrial countries quotas)*.[11] The higher the ratio of credit

[11] This variable is an approximation of the current IMF measure of liquidity, the Forward Commitment Capacity (FCC). Among other considerations, the FCC includes the Fund's holdings of the currencies of members included in the Financial Transactions Plan (countries with sufficiently strong balance of payments and reserve position), a

(continued…)

outstanding to industrial countries quotas, the lower is the IMF liquidity. Bird and Rowland (2001) find a positive but non significant coefficient. Last, but not least, *a country's share of total IMF quota* measures a member's voting power and relative size in the world economy, hence, for given economic conditions, a higher country quota raises the probability of IMF loans. It is not only that, the higher is a member's quota, the more votes the country has on the IMF Board to approve an arrangement, but also the fact that the higher its quota, the larger is the potential systemic impact of a macroeconomic adjustment on the world economy, and, hence, the need for IMF assistance from a global perspective. Barro and Lee (2005) find a positive but not significant coefficient.

Although they have received less attention in the literature until recently, it is important to include global variables. On the one hand, we include *real world interest rates (proxied by real 3-month LIBOR)* because high real international interest rates may trigger debt servicing problems that require subsequent Fund assistance (Bird and Rowlands 2001). Additionally, the real 3-month LIBOR is a good indicator for capital flows to emerging markets since higher real world interest rates usually decrease capital flows to emerging markets (Abiad 2003). On the other hand, higher *real world GDP growth* increases the demand for exports from developing countries, helping to lower current account deficits, and hence, the need to borrow from the Fund falls. Elekdag (2006) finds that both the real interest rate and the world business cycle have the expected and significant effect on the probability of the approval of a SBA. In contrast, Ghosh et al (2007) do not find these variables significant in their estimation of the probability of having a SBA/EFF program.

Finally, we introduce the lag of the dependent variable as the last explanatory variable. A country is more likely to continue withdrawing resources if it did so in the previous quarter.[12] The lag of the dependent variable would control for factors that influenced the joint decision of having a drawing program in the last quarter and are not included in the above explanatory variables, as well as, certain inertia in drawing programs. On the latter, even if members' macroeconomic conditions improve, they sometimes continue borrowing from the Fund because, for example, Fund interest rates are below the market rate at which a member can borrow commercially.[13]

III.2. Determinants of Participation in New IMF Drawing Programs

The study of the determinants of participation in new IMF drawing programs is also interesting The factors that might drive the beginning of a drawing program are not necessarily the same as

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majority of which are advanced economies. For more information see Financial Organization and Operations of the IMF, Pamphlet Series No 45, 2001.

[12] It is worthwhile to highlight that the lag of the dependent variable (having a drawing program) is different from the previously defined past program variable because the latter includes not only drawing programs but also precautionary and off-track programs.

[13] From a member's perspective, the cost of borrowing from the Fund is not only the interest rate imbedded in IMF programs but also the conditionality attached to Fund arrangements. A member with an on-track program would most likely not consider the cost of IMF conditionality as burdensome.

those that might drive participation during the life of a drawing program. As mentioned above, there is some inertia in Fund arrangements even when countries' fundamentals improve during the life of a program.

Moreover, even though the beginning of a drawing program is not necessarily the beginning of a consecutive period of drawing programs, some drawing programs were cancelled early but were followed immediately by a successor drawing program when the country became subject to an exogenous shock (e.g. Turkey interrupted its SBA in early 2002 and started a larger successor SBA in the same day). Mussa and Savastano (1999) found that more than ten percent of the arrangements in their sample were cancelled early but followed by a successor arrangement. They claim that this phenomenon is more likely in cases where weak policy implementation or large unforeseen shocks rendered the original objectives unattainable, but where it was possible to reach understanding fairly rapidly on a new adjustment program.

In general, we expect that the determinants of a new drawing programs are likely to be similar to the analysis of the determinants of drawing programs, but not necessarily identical. Some factors, especially country-specific variables (e.g., the current account), might be more relevant at the beginning of a drawing program. The same country-specific, political and institutional, and global variables used in the analysis of the drawing programs are also used to analyze the determinants of participation in a new drawing program.

III.3. Data Set

The data set covers 59 of the 81 current developing, non-PRGF-eligible countries quarterly during the period 1982–2005. Unlike the annual data used in the literature, the quarterly data offer a better possibility of taking into account the changes in the countries' economic variables, such as reserves and exchange rates, which are often sudden during a crisis. The sources of the data were mainly the IMF International Financial Statistics (IFS) and the World Economic Outlook (WEO). Appendix A contains more detailed information about the country coverage and the variables used and their sources. When necessary, the data for some countries and subperiods have been linearly interpolated from annual data (19 percent of the data).

Not only is constructing a consistent quarterly dataset challenging but there is also a constant trade off between the type of variables included and the number of countries covered. For example, other quarterly political variables (e.g. bureaucracy quality, law and order, corruption, and ethnic tensions) and financial variables (e.g. domestic credit growth) were not included in the reported results because they considerably limit the country coverage and most of them were not significant.

Regarding country coverage, some Eastern European countries, which joined during the 1990s, are included in the sample with about a 2 year lag because of a lack of data for earlier years. The 22 developing, non-PRGF countries not included because of a lack of data are mostly Middle East countries and small island states. The exclusion of these countries is not likely to change the results significantly because they had, as a group, at most two drawing programs in a quarter. See country coverage also in Appendix A.

The periods when countries have arrears were also taken into account. Even though a country

with arrears may have a program, it cannot draw. Hence, the quarters when countries have arrears are excluded from the sample because they determine perfectly the non-existence of a drawing program.[14]

IV. Empirical Results

Table 1 reports the results for the probit estimation of the determinants of participation in IMF drawing programs (Equation 1). We present three sample periods (1982q1–2003Q4, 1982q1–1993q2, and 1993q3–2003q4),[15] and two alternative specifications for each sample period. The alternative specifications (models 2, 4, and 6), include only the countries that had at least 3 percent of credit outstanding at any quarter of the sample. These are the major borrowing countries that have driven the evolution of credit outstanding.[16] Regressions are estimated with robust standard errors, allowing for the possibility that observations for the same country may not be independent (i.e., we allow for clustered standard errors for observations of the same country). Marginal effects coefficients are reported instead of the estimated coefficients because probit models are highly non-linear. Marginal effects are measured at the variables' means, except for the binary variables which are measured for the change from 0 to 1.

The results can be summarized as follows. First, country-specific variables affect the probability that a country has a drawing program. The level of net international reserves has the expected negative sign and it is significant in all specifications and sample periods. Real country GDP growth is also significant and with the expected negative sign in most specifications. A country's current account measurement has the correct sign but it is rarely significant. The case of the real effective exchange rate is surprising. It is significant only for major borrowers, but with different signs in each subsample. Only the result from the most recent subperiod, which started before the Mexican crisis in 1994, indicates that countries with overappreciated effective exchange rates were more likely to have a drawing program. On the contrary, as interpreted by the literature, changes in the underlying equilibrium real exchange rate might have been driving the significant negative sign of this variable during the 1980s and the whole sample 1982–2003.

Second, as expected, the lag of the dependent variable is highly significant and has a very large marginal effect. The dummy variable that captures the existence of a drawing program in the previous two years is also positive and significant in all specifications covering all countries of the sample. These results highlight the presence of inertia in drawing programs through the dependent variable lag, and the significance of political considerations, such as overcoming the

[14] Four countries in our sample (Dominican Republic, Jamaica, Panama and Peru) had arrears during a few quarters of the sample period.

[15] The model was estimated from 1982 to 2003 in order to perform out-of-sample forecasts for the remaining 2004-05 period.

[16] The number of major borrowing countries, countries that had at least 3 percent of credit outstanding at any quarter of the sample, are 22. See table with the country coverage in Appendix A.

political cost of turning to the Fund and greater familiarity with Fund procedure, which are imbedded in the past program variable.[17]

Table 1 - Probit Estimations of the Likelihood that a Country has a Drawing Program (1982Q1 - 2003Q4)

Independent Variables	Dependent Variable: Drawing Arrangement=1, otherwise=0					
	Sample 1982q1-2003q4		Sample 1982q1-1993q2		Sample 1993q3-2003q4	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Net International Reserves (t-1)	-0.0114	-0.0237	-0.0249	-0.0409	-0.0041	-0.0165
	0.0022 ***	0.0035 ***	0.0046 ***	0.0124 ***	0.0015 **	0.0031 ***
External Current Account (t-1)	-0.0015	-0.0061	-0.0030	-0.0065	-0.0008	-0.0048
	0.0010	0.0028 **	0.0023	0.0080	0.0009	0.0032
Country GDP real growth (t-1)	-0.0052	-0.0115	-0.0037	-0.0064	-0.0058	-0.0120
	0.0013 ***	0.0033 ***	0.0019 **	0.0051	0.0013 ***	0.0033 ***
Country Inflation (CPI) (t-1)	0.0110	-0.0167	0.0197	-0.0098	0.0157	0.0396
	0.0149	0.0259	0.0205	0.0366	0.0143	0.0332
Real Effective Exchange Rate (t-1)	-0.0001	-0.0005	-0.0004	-0.0015	0.0002	0.0013
	0.0001	0.0002 **	0.0003	0.0004 ***	0.0003	0.0007 *
Government Deficit (t-1)	0.0010	0.0004	0.0019	0.0040	0.0014	0.0031
	0.0020	0.0061	0.0027	0.0082	0.0024	0.0078
Country quota	0.0164	0.0147	0.0263	0.0550	0.0107	-0.0169
	0.0101	0.0182	0.0140 *	0.0354	0.0091	0.0233
IMF liquidity (t-1)	0.0001	0.0003	-0.0015	-0.0023	0.0002	-0.0001
	0.0005	0.0014	0.0012	0.0025	0.0005	0.0014
Real LIBOR rate	0.0017	0.0014	0.0024	0.0167	-0.0029	-0.0063
	0.0021	0.0065	0.0047	0.0120	0.0035	0.0089
World GDP real growth	-0.0135	-0.0135	-0.0397	-0.0740	0.0077	0.0194
	0.0052 **	0.0127	0.0103 ***	0.0242 ***	0.0093	0.0289
Program in the last 2 years	0.0780	0.0515	0.0974	0.0746	0.0525	0.0376
	0.0161 ***	0.0319 *	0.0277 ***	0.0506	0.0139 ***	0.0387
Drawing Program (t-1)	0.6765	0.7344	0.5928	0.6785	0.7538	0.8054
	0.0340 ***	0.0326 ***	0.0426 ***	0.0387 ***	0.0417 ***	0.0469 ***
Number of Observations	4287	1655	1900	757	2387	898
Pseudo R-squared	0.62	0.59	0.58	0.51	0.68	0.69
Wald chi2	1521.48	1365.14	906.16	999.69	940.47	653.95
P-value of Wald chi2	0.00	0.00	0.00	0.00	0.00	0.00
Wald test of Golbal Variables	6.44	1.17	14.48	8.86	0.92	0.69
P-value of Global variables	0.04	0.56	0.00	0.01	0.63	0.71
Wald test of Institutional Variables	2.99	1.00	6.05	3.04	1.62	0.51
P-value of Institutional variables	0.22	0.61	0.05	0.22	0.44	0.77

This table reports the marginal effects of probit regressions with standard error adjusted for clustering on each country. Marginal effects are measured at the variables' means, except for the binary variables which are measured for the change from 0 to 1. A constant is estimated but not reported. Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 , and 1 percent, respectively.

Third, with respect to the global variables, world GDP growth seems to have the expected sign and it is significant during the entire sample period, especially during the debt crisis subsample.[18] Moreover, the joint F-tests of the global variables show that global variables were

[17] Political variables such as bureaucracy quality, law and order, corruption, and ethnic tensions were estimated but they were not statistically significant. As mentioned earlier, they were not included because they reduced the number of countries covered.

[18] This result is robust to the introduction of a time-trend and country-specific dummies. See Section V. Even though the real world interest rate is insignificant, its expected sign is correct. Oil prices are the other global variable found significant by Elekdag (2006) and Ghosh et al (2007). This variable turns to be insignificant if it is included in our sample. This is probably driven by the fact that those two studies include the 1970s in their estimations.

significantly different from zero during the debt crisis subsample, but not in the next second half of the sample. These findings indicate that world GDP growth influenced several countries to borrow simultaneously during the 1980s. In contrast, since the Mexican crisis in 1994, the decision to borrow was driven mostly by country specific factors.

Fourth, the fit of the different models seems to be quite good, with pseudo-R-squares between 0.5 and 0.7.[19] Finally, and in line with the findings of the literature, both IMF institutional variables, country quota and IMF liquidity, are not statistically different from zero neither individually nor jointly.

Table 2 - Probit Estimations of the Likelihood that a Country has a *New* Drawing Program (1982Q1 - 2003Q4)

Independent Variables	Dependent Variable: New Drawing Arrangement=1, otherwise=0					
	Sample 1982q1-2003q4		Sample 1982q1-1993q2		Sample 1993q3-2003q4	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Net International Reserves (t-1)	-0.0045	-0.0074	-0.0080	-0.0120	-0.0020	-0.0048
	0.0008 ***	0.0011 ***	0.0013 ***	0.0033 ***	0.0007 **	0.0011 ***
External Current Account (t-1)	-0.0005	-0.0023	-0.0008	-0.0030	-0.0003	-0.0019
	0.0003	0.0009 **	0.0006	0.0017 *	0.0004	0.0011 *
Country GDP real growth (t-1)	-0.0018	-0.0028	-0.0014	-0.0020	-0.0021	-0.0028
	0.0004 ***	0.0008 ***	0.0005 **	0.0012	0.0005 ***	0.0009 ***
Country Inflation (CPI) (t-1)	0.0091	0.0027	0.0110	0.0069	0.0109	0.0136
	0.0043 **	0.0045	0.0055 **	0.0054	0.0042 ***	0.0110
Real Effective Exchange Rate (t-1)	-0.0001	-0.0003	-0.0001	-0.0005	0.0000	-0.0002
	0.0001	0.0001 ***	0.0001	0.0001 ***	0.0001	0.0002
Government Deficit (t-1)	0.0091	0.0008	0.0010	0.0011	0.0009	0.0015
	0.0007	0.0011	0.0008	0.0021	0.0008	0.0018
Country quota	0.0040	0.0017	0.0020	-0.0089	0.0051	0.0069
	0.0034	0.0055	0.0045	0.0108	0.0032	0.0060
IMF liquidity (t-1)	0.0001	0.0002	-0.0001	0.0000	0.0001	0.0000
	0.0001	0.0004	0.0003	0.0007	0.0002	0.0005
Real LIBOR rate	0.0012	0.0015	0.0002	0.0007	0.0010	0.0032
	0.0007 *	0.0015	0.0011	0.0022	0.0019	0.0043
World GDP real growth	-0.0080	-0.0106	-0.0117	-0.0189	-0.0047	-0.0067
	0.0021 ***	0.0048 **	0.0035 ***	0.0082 **	0.0060	0.0158
Program in the last 2 years	0.0188	-0.0041	0.0132	-0.0132	0.0191	-0.0001
	0.0059 ***	0.0092	0.0092	0.0193	0.0065 ***	0.0129
Number of Observations	4287	1655	1900	757	2387	898
Pseudo R-squared	0.12	0.11	0.12	0.10	0.11	0.12
Wald chi2	181.82	122.14	117.05	104.57	143.93	112.27
P-value of Wald chi2	0.00	0.00	0.00	0.00	0.00	0.00
Wald test of Golbal Variables	21.85	7.81	14.25	6.56	0.61	0.56
P-value of Global variables	0.00	0.02	0.00	0.04	0.63	0.76
Wald test of Institutional Variables	1.60	0.37	0.40	0.87	0.74	1.52
P-value of Institutional variables	0.45	0.83	0.82	0.65	0.22	0.47

This table reports the marginal effects of probit regressions with standard error adjusted for clustering on each country. Marginal effects are measured at the variables' means, except for the binary variables which are measured for the change from 0 to 1. A constant is estimated but not reported. Robust standard errors in parentheses. *, **, *** denote significance at 10, 5 , and 1 percent, respectively.

Table 2 presents the same set of regressions for the determinants of participation in *new* IMF drawing programs. As expected, the results are very similar to the determinants of participation

[19] Further analysis of the goodness-of-fit evaluation of the predictive performance of the model is performed in the next section.

in IMF drawing programs, but not identical. The main differences are that, on the one hand, the current account variable seems to have a significant negative expected sign within major borrower countries, indicating that these countries were more likely to have engaged in a new drawing program, the higher the current account deficit. Additionally, and also somewhat unexpected given the lack of significant results found in the literature, there is evidence that inflation seems to be an important determinant of the beginning of a drawing program. Both results highlight the fact that countries are more likely to engage in new drawing programs when they are going through a deterioration of their economic performance reflected in inflationary pressures or current account problems.

V. Robustness, Goodness-of-Fit and Forecasting

To check the robustness of our findings, we conduct two analyses. First, we include a time trend and country-fixed effects in the estimations. Although the significant levels of a few variables change, the main results presented earlier are the same (see Appendix D for more information). Second, we further refine the concept of a drawing program that is used in this paper, taking into account, that a country program might become off-track for a long period, and then, it could move on-track and have drawings towards the end of the program. In this sense, we adjusted the definition to exclude, as drawing programs, the periods when countries did not borrow for more than three quarters within the same program, but it did not affect the results.[20]

A goodness-of-fit evaluation of the estimated equations is required to judge the predictive performance of the models. Table 3 shows the goodness-of-fit tables for having a drawing program model (model 1 of Table 1). This model seems to have a very good predictive performance. The model correctly calls 94 percent of observations (86 percent of drawing programs and 96 percent of non-drawing programs). The falsely predicted drawing programs represent only 15 percent of the total predicted programs. The out-of-sample results provide a similar picture. The number of falsely predicted programs increases from 15 percent to 27 percent. Similarly, Figure 3 shows the estimated probability of having a drawing and the actual drawing programs of a major borrower. When the actual series is equal to one there is a drawing program in that quarter. The figure includes both the estimated probability of having a drawing program using model 1 (all countries) and model 2 (major borrowing countries). In the goodness-of-fit tables, we can see that the estimated probabilities of having a drawing program follow the actual series relatively well. Nevertheless, the importance of the lag of the dependent variable is significant and it restricts the real forecasting power of the model. The estimated probabilities seem to decrease toward the end of a drawing program but the drop is not large enough.

The computation of the goodness-of-fit table of having a new drawing program model (model 1 of Table 2) is not as straightforward as in the drawing program case. It requires a more detailed analysis in the selection of the cut-off probability value. A 50 percent threshold probability will

[20] There are usually delays in the completion of program reviews, and, hence, in the period between countries' drawings. We have identified only 8 cases when withdrawals were more than three quarters apart. In this regard, it is worthwhile to highlight that allowing a difference of three quarters between drawings is equivalent to a range of 6 to 9 months between drawings.

not positively predict any new drawing program since all estimated probabilities of having a new drawing program are below 50 percent. Following the empirical probit literature, we will use a loss-function approach in the selection of the cut-off threshold. The selected cut-off threshold is the value that minimizes the loss-function equal to the weighted sum of falsely predicted new drawing programs (as a share of total no-new drawing program quarters) and the missed new drawing programs (as a share of the total new drawing program quarters).[21]

Table 3 - Dependent Variable is Drawing Program; Cut-off = 50 percent

Goodness-of-Fit Tables

In Sample Period (1982Q1 - 2003Q4)

Predicted	Actual		
	Program	No-Program	Total
Program	708	125	833
No-Program	119	3335	3454
Total	827	3460	4287

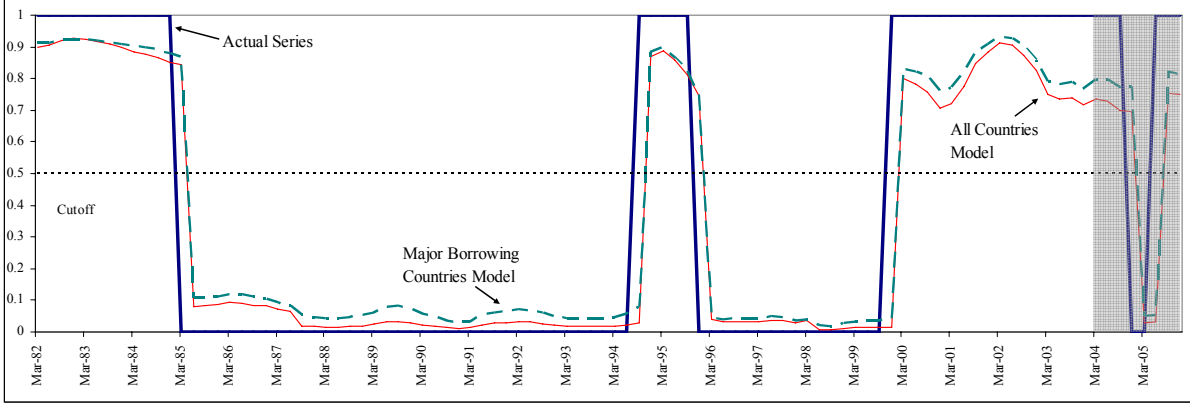
Out of Sample Period (2004Q1 - 2005Q4)

Predicted	Actual		
	Program	No-Program	Total
Program	24	9	33
No-Program	4	404	408
Total	28	413	441

Summary Statistics

	In-Sample	Out-of-sample
Percent of observations correctly called	94	97
Percent of Drawing Programs correctly called	86	86
Percent of No-Drawing Programs correctly called	96	98
False predicted drawing program for total predicted drawing programs	15	27
Probability of an actual program given:		
A predicted drawingprogram	85	73
A predicted no-drawing program	3	1

Figure 3 - Drawing Program Probabilities of a Major Borrower during the Period 1982q1-2005q4



Following the procedure described above, Table 4 presents the goodness-of-fit tables for having a new drawing program model using 3 percent as the estimated optimal cut-off threshold. Although the model correctly predicts in-sample 82 percent of the new drawing programs, the

[21] We are implicitly assuming in this paper an equal weight to the share of predicted new drawing programs that are false and the share of new drawing program that are missed. See Demirguc-Kunt and Detragiache (1999) for an example with unequal weights. Using this procedure in the drawing program case instead of the standard 50 percent cut-off does not affect the results.

model correctly predicts only 63 percent of the total observations. The false predictions are much higher than in the case of drawing programs. Out-of sample, as expected, the model does not perform better. It predicts 97 percent of the observations but only 1 out of 5 new drawing programs. Similar to Figure 3, Figure 4 illustrates the evolution of the estimated probability of a new drawing program from 1982 to 2005. The model correctly predicts some but not all of the new drawing programs. There are some occasions when the model predicts the new drawing program reasonably well and with some anticipation (e.g. first quarter of 2002), but it performs poorly on other occasions.

Table 4 - Dependent Variable is *New* Drawing Program; Cut-off = 3 percent

Goodness-of-Fit Tables

In Sample Period (1982Q1 - 2003Q4)

Predicted	Actual		
	Program	No-Program	Total
Program	128	1573	1701
No-Program	28	2558	2586
Total	156	4131	4287

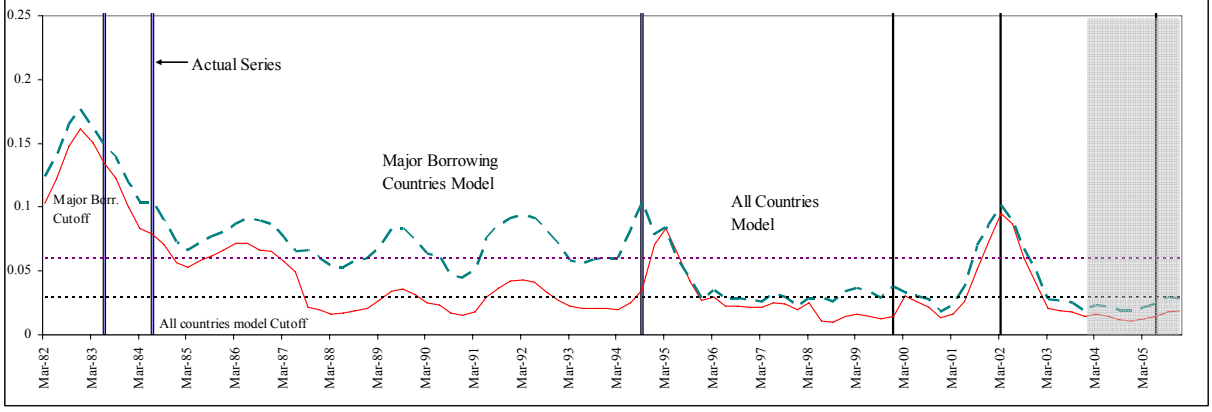
Out of Sample Period (2004Q1 - 2005Q4)

Predicted	Actual		
	Program	No-Program	Total
Program	1	8	9
No-Program	4	428	432
Total	5	436	441

Summary Statistics

	In-Sample	Out-of-sample
Percent of observations correctly called	63	97
Percent of New Drawing Programs correctly called	82	20
Percent of No-New Drawing Programs correctly called	62	98
False predicted new draw. program for total predicted new draw. programs	92	89
Probability of an actual new drawing program given:		
A predicted new drawing program	8	11
A predicted no-new drawing program	1	1

Figure 4 - New Drawing Program Probabilities of a Major Borrower during the Period 1982q1-2005q4



The fact that there have been fewer new drawing programs after the debt crisis might imply that we are probably choosing a very high cut-off threshold.[22] We could adjust the cut-off to the optimal value, 2 percent, that we obtain if we use only the observations from 1993q2 to 2003q4. Note that we are using the same model as before, estimating the determinants from 1982 to

[22] There were 92 new drawing programs out of 1900 observations during the period 1982q1-1993q2 and 64 out of 2387 observations during the period 1993q3-2003q4.

2003, but with a lower cut-off threshold. Table 5 shows that we are predicting 3 out of 5 new drawing programs. In terms of credit outstanding, this is not a minor detail if we use the model forecast to estimate the level of credit outstanding given that there have been few countries with drawing programs recently but of those few, the drawings have been large[23]

Table 5 - Dependent Variable is *New* Drawing Program); Cut-off = 2 percent

Goodness-of-Fit Table
Out of Sample Period (2004Q1 - 2005Q4)

Predicted	Actual		
	Program	No-Program	Total
Program	3	25	28
No-Program	2	411	413
Total	5	436	441

Summary Statistics	Out-of-sample
Percent of observations correctly called	94
Percent of New Drawing Programs correctly called	60
Percent of No-New Drawing Programs correctly called	94
False predicted new draw. prog. for total predicted new draw. Prog.	89
Probability of an actual new drawing program given:	
A predicted new drawing program	11
A predicted no-new drawing program	0.5

Finally, in terms of forecasting, we are probably asking too much from the model. We are not only asking whether a country might have a new drawing program but also the exact timing of the program. This requirement was relaxed by using a concept from the early-warning currency crisis literature. In line with this, we calculate the probability of having a new drawing program within the year (4 quarters). Following this definition it was possible to correctly predict all countries programs but one.

VI. Concluding Remarks

The results of this paper highlight the leading role of some country-specific variables, such as net international reserves and country's GDP growth, in IMF borrowing. Other variables, such as having a program in the previous two years, indicate that there is also a general increase in the likelihood of having a successor drawing program. The literature has interpreted this as being probably due to potential lower political cost and/or greater knowledge in negotiating with the IMF. The existence of external current account problems matters significantly for a new drawing program only among the major borrower country group, highlighting the IMF role as the lender of last resort amongst these countries and the fact that balance of payment problems seem to be important at the beginning of a new drawing program. The role of world GDP growth is highly significant during the 1980s debt crisis but it does not have any role after that period. This is compatible with the commonly held view that the more recent crises were fundamentally different from the 1980s debt crises.

Based on the findings of this paper, the demand for Fund credit would depend on both global and country specific factors. Only country specific factors would result in increases in Fund credit as a function of the size and the severity of the borrowing countries needs, as in the recent decades. In contrast, the additional presence of a global factor could drive the level of credit outstanding substantially higher. A large number of simultaneous programs as in the 1980s at the recent exceptional access levels could translate into a significant increase in the level of credit outstanding.

[23] Past countries' average real credit outstanding or the recent proportion of credit outstanding to GDP could be use to project the level of credit outstanding of a country.

Finally, the out-of-sample results for forecasting the beginning of a drawing program is somewhat informative. It correctly predicted 3 to 4 out of 5 new drawing programs during 2004-5, but not necessarily the largest ones. This matters for estimating the future demand for total Fund credit. For future work, a Markov switching model with two stages (drawing and not-drawing) and time-varying transition probabilities could be an interesting alternative modeling approach to explore. A Markov switching model could improve the estimations since it might better capture the transitions between drawing and not-drawing programs than a probit model. However, there are some disadvantages to implementing the former model, such as the need to estimate more parameters and the probability that the model might fail to converge because its likelihood function is sometimes ill-behaved.

Appendix A

Variable Definitions, Data Sources and Country Coverage

The basic dataset used in this paper consists of quarterly observations of data for 59 developing, non-PRGF countries over the period 1982–2005. The source of the quarterly data were the IMF International Financial Statistics (IFS), the World Economic Outlook (WEO) and GDS (Global Data Source). When necessary, the data for some countries and subperiods have been linearly interpolated from annual WEO data if available (around 19 percent of the data). The variables definitions used in the estimations and their sources are:

Dependent Variables	
IMF Drawing Program	The period from the SBA/EEF program approval until the last purchase under the program, with the caveat that the timing of the first purchase is taken instead of the program approval if the first purchase was more than two quarters after the approval or the program was precautionary upon approval. (Source: IMF annual Reports and IMF web page)
New IMF Drawing Program	First quarter of an IMF drawing program
Country-specific Variables	
Country GDP real growth	Percentage change in real GDP during the last 4 quarters (source: WEO and GDS)
Net International Reserves	International reserves (excluding gold; source: WEO) minus IMF credit outstanding (source: IFS) divided by total imports (source: IFS), times 12
External Current Account	Current account balance during the last 4 quarters (source: IFS and WEO for some 2004-5 observations) as a percentage of nominal GDP (source: WEO and GDS)
Real Effective Exchange Rate	Real effective exchange rate index with base 2000=100 (source: INS)
Country Inflation (CPI)	Logarithm of one plus CPI inflation of the last 4 quarters (source: IFS)
Government Deficit	Annual government fiscal deficit during the last 4 quarters (source: IFS and WEO) as a percentage of nominal GDP (source: WEO and GDS)
Political and Institutional Variables	
Program in the last 2 years	Dummy variable that is equal to one if the country had a SBA/EFF Program (precautionary or non-precautionary) in the last 8 quarters.
Country quota	IMF country quota as a percentage of total quota (source: IFS)
IMF liquidity	IMF developed countries quotas minus total credit outstanding divided by IMF developed countries quotas (Source: IFS)
Global Variables	
Real LIBOR rate	3-months LIBOR rate minus US CPI inflation during the last 4 quarters (source: IFS)**.**
World GDP real growth	Annual Percentage change in real world GDP (source: WEO)

Appendix A

The table below depicts the 59 countries included in this study. Countries with an * are part of the major borrowing countries group, which includes countries that had at least 3 percent of credit outstanding during any quarter of the sample.

Argentina *	Dominican Republic	Latvia	Russia *
Bahamas, The	Ecuador	Lithuania	Saudi Arabia
Bahrain, Kingdom of	Egypt *	Macedonia, FYR	Seychelles
Barbados	El Salvador	Malaysia	Slovak Republic
Belarus	Estonia	Malta	Slovenia
Belize	Fiji	Mauritius	South Africa
Botswana	Gabon	Mexico *	Swaziland
Brazil *	Guatemala	Morocco *	Thailand *
Bulgaria	Hungary *	Oman	Trinidad and Tobago
Chile *	India *	Panama	Tunisia
China,P.R.: Mainland *	Indonesia *	Paraguay	Turkey *
Colombia	Jamaica	Peru *	Ukraine *
Costa Rica	Jordan	Philippines *	Uruguay *
Croatia	Kazakhstan	Poland *	Venezuela, Rep. Bol. *
Czech Republic *	Korea *	Romania *	

Appendix B

Estimation of the real IMF credit outstanding level

The analysis of Fund credit outstanding (CO) is frequently undertaking using SDR nominal values. This procedure does not have drawbacks when the period under analysis is relatively short or when the period is characterized by very low inflation. For longer periods of time, the use of nominal CO might underestimate the real size of Fund lending in earlier periods. An SDR-denominated CO series, showing a real or constant SDR purchasing power over time, is required for the analysis of a long time series of CO. Given that the SDR's value is calculated using a five-currency basket (France, Germany, Japan, the United States, and the United Kingdom) since 1981, the inflation-adjusted SDR value must take into account the inflation of the countries whose currencies compose the SDR basket.

Similar to the SDR interest rate, the SDR inflation rate can be defined as the sum of the multiplicative products in SDR terms of the currency amounts in the SDR valuation basket,[24] the inflation rate of each country whose currency is a component of the currency in the basket, and the exchange rate of each currency against the SDR. In other words, the SDR monthly inflation is equal to:

$$SDR\_Inflation = \sum_i \left(Currency\_Amount_i * Exchange\_Rate_i * CPI\_Inflation_i \right)$$

where the subindice (i) stands for the countries whose currencies make up the SDR basket.

Two modifications are implemented in the SDR inflation calculation with respect to the SDR interest rate calculation:

- The inflation rate calculation is performed monthly (not weekly) using each country IFS monthly exchange rates and each country IFS CPI indexes (line 64).[25]

- Following the introduction of the Euro in January 1999, German and French inflation rates entered in the SDR inflation rate calculation using the Euro exchange rate weight and keeping constant the relative weight of the continental European inflation in the basket as of December 1998.

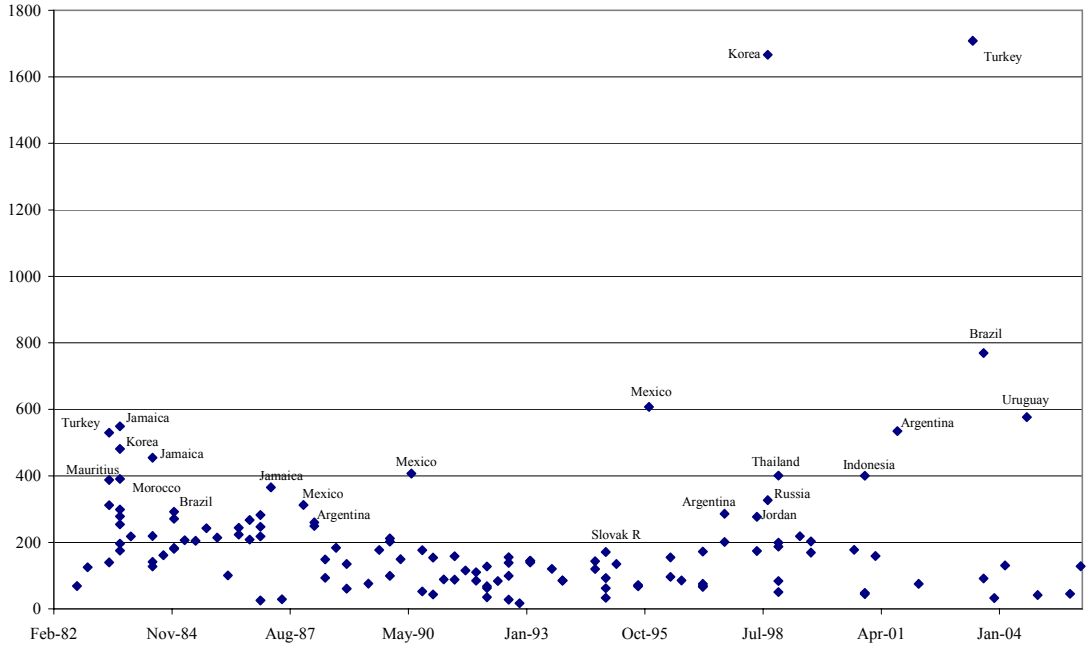
Once the SDR inflation rate series is calculated and a base year (e.g. January 1981) has been chosen, it is straightforward to calculate the SDR-CPI index. Then, the SDR-CPI index can be used to deflate the nominal CO.

[24] Currency amounts are calculated on the last business day preceding the date the new SDR currency basket becomes effective. On that day, currency amounts are derived from the weights decided by the Executive Board using the average exchange rate for each currency over the preceding three months. Currency amounts are adjusted proportionally to ensure that the value of the SDR is the same before and after the revision. The currency amounts remain fixed for the subsequent five-year period. As a result, the actual weight of each currency in the value of the SDR changes on a daily basis as a result of changes in exchange rates.

[25] West Germany's inflation rates are used for the periods before the unification of Germany.

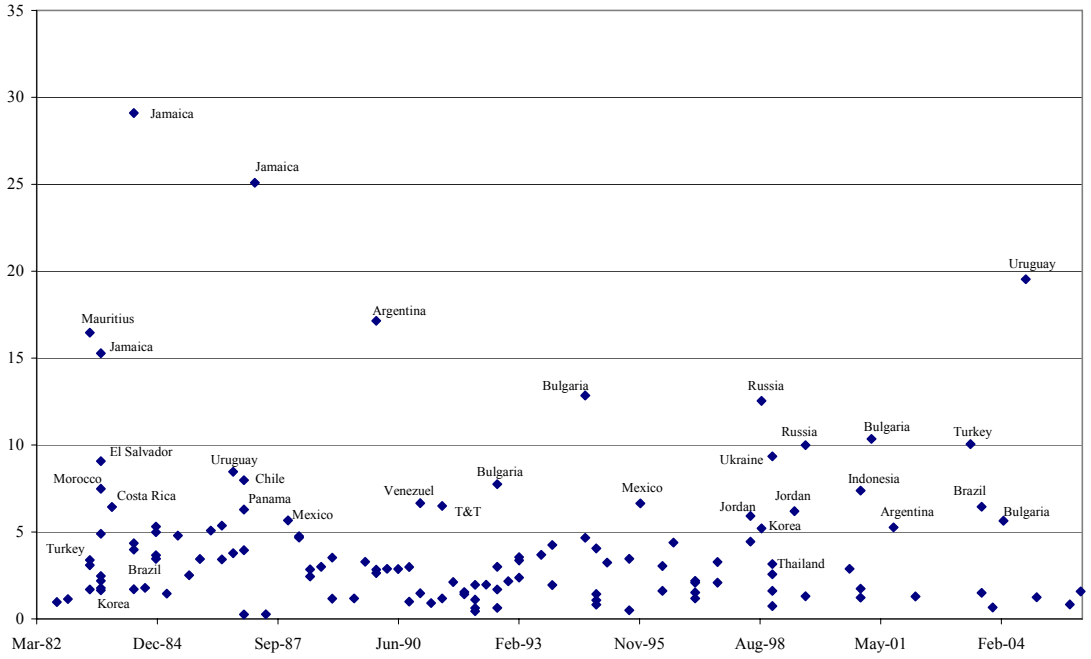
Appendix C

Figure C.1 - Maximum Credit Outstanding Relative to Quota
(by Country Drawing Program[1], percentage)



1) In order to easily identify the countries names, we show only one observation in the case of consecutive drawing programs.

Figure C.2 - Maximum Credit Outstanding Relative to GDP
(by Country Drawing Program[1], percentage)



1) In order to easily identify the countries names, we show only one observation in the case of consecutive drawing programs.

Appendix D

Robustness Tests

We include a time trend and country-fixed effects in the estimations. The time trend could capture a time variation that may not necessarily be related to the global variables included in the estimations. The country fixed effects have the advantage that they might capture country specific characteristics but at the cost that all countries, which have not had a drawing program in the sample, are excluded from the estimations since their countries' dummies perfectly predict the absence of drawing programs. Table D.1 and D.2 show the results of including the time-trend and country-fixed effects. Although the significant levels of a few variables change, the main results presented earlier are the same.

Table D.1 - Probit Estimations of the Likelihood that a Country has a Drawing Program (1982Q1 - 2003Q4)

Independent Variables	Dependent Variable: Drawing Arrangement=1, otherwise=0					
	Sample 1982q1-2003q4		Sample 1982q1-1993q2		Sample 1993q3-2003q4	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Net International Reserves (t-1)	-0.0249	-0.0434	-0.0563	-0.0829	-0.0314	-0.0589
	0.0044 ***	0.0082 ***	0.0099 ***	0.0183 ***	0.0100 ***	0.0163 ***
External Current Account (t-1)	-0.0019	-0.0048	-0.0031	0.0127	-0.0020	-0.0114
	0.0019	0.0043	0.0039	0.0088	0.0037	0.0091
Country GDP real growth (t-1)	-0.0096	-0.0112	-0.0080	-0.0041	-0.0182	-0.0240
	0.0020 ***	0.0035 ***	0.0041 **	0.0068	0.0038 ***	0.0074 ***
Country Inflation (CPI) (t-1)	-0.0342	-0.0694	0.0316	0.0117	-0.0293	-0.0733
	0.0241	0.0363	0.0455	0.0610	0.0475	0.1603
Real Effective Exchange Rate (t-1)	-0.0007	-0.0013	-0.0013	-0.0020	-0.0001	0.0004
	0.0003 **	0.0005 **	0.0007 *	0.0013 ***	0.0011	0.0021
Government Deficit (t-1)	0.0005	-0.0084	-0.0004	-0.0012	0.0085	-0.0081
	0.0024	0.0043 *	0.0049	0.0080	0.0064	0.0159
Country quota	-0.0278	0.2515	0.3606	0.2786	-0.3372	-0.3489
	0.1238	0.1907	0.2833	0.4033	0.5189	0.8401
IMF liquidity (t-1)	-0.0003	0.0012	-0.0053	-0.0038	-0.0006	0.0016
	0.0007	0.0015	0.0023 *	0.0035	0.0015	0.0037
Real LIBOR rate	0.0017	0.0191	0.0160	0.0307	-0.0188	0.0024
	0.0053	0.0111 *	0.0140	0.0322	0.0115	0.0256
World GDP real growth	-0.0305	-0.0383	-0.1033	-0.1339	0.0363	0.0077
	0.0112 ***	0.0198 *	0.0231 ***	0.0355 ***	0.0314	0.0641
Program in the last 2 years	0.0357	0.0400	0.0056	-0.0261	-0.0389	0.0068
	0.0224	0.0399	0.0475	0.0776	0.0512	0.0974
Drawing Program (t-1)	0.6767	0.7087	0.6358	0.6683	0.7335	0.7699
	0.0248 ***	0.0304 ***	0.0333 ***	0.0406 ***	0.0339 ***	0.0462 ***
Time-Trend	-0.0002	0.0033	0.0032	0.0033	-0.0029	0.0013
	0.0004	0.0011 ***	0.0021	0.0054	0.0012 **	0.0044
Number of Observations	3237	1549	1364	686	1281	649
Wald chi2	1741.37	778.20	687.90	345.81	731.91	369.35
P-value of Wald chi2	0.00	0.00	0.00	0.00	0.00	0.00
Wald test of Golbal Variables	9.38	4.54	25.78	16.18	2.59	0.07
P-value of Global variables	0.01	0.10	0.00	0.00	0.27	0.96
Wald test of Institutional Variables	0.28	2.49	7.51	1.87	0.60	0.37
P-value of Institutional variables	0.87	0.29	0.02	0.39	0.74	0.83

Appendix D

Table D.2 - Probit Estimations of the Likelihood that a Country has a *New* Drawing Program (1982Q1 - 2003Q4)

Independent Variables	Dependent Variable: New Drawing Arrangement=1, otherwise=0					
	Sample 1982q1-2003q4		Sample 1982q1-1993q2		Sample 1993q3-2003q4	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Net International Reserves (t-1)	-0.1032	-0.0094	-0.1836	-0.0201	-0.0050	-0.0073
	0.0223 ***	0.0022 ***	0.0389 ***	0.0058 ***	0.0028 *	0.0040 *
External Current Account (t-1)	-0.0122	-0.0023	-0.0022	0.0012	-0.0003	-0.0036
	0.0105	-0.0020 *	0.0166	0.0032	0.0012	0.0023
Country GDP real growth (t-1)	-0.0316	-0.0005	-0.0132	-0.0009	-0.0035	-0.0023
	0.0091 ***	0.0010 **	0.0150	0.0022	0.0011 ***	0.0014 *
Country Inflation (CPI) (t-1)	-0.0381	-0.0076	-0.0056	-0.0037	-0.0022	-0.0020
	0.0016	0.0102	0.1715	0.0191	0.0131	0.0246
Real Effective Exchange Rate (t-1)	-0.0050	-0.0005	-0.0058	-0.0005	-0.0003	-0.0009
	0.0016 ***	0.0002 ***	0.0027 **	0.0004	0.0004	0.0005 **
Government Deficit (t-1)	-0.0007	-0.0012	-0.0040	-0.0016	0.0002	-0.0023
	0.0130	0.0015	0.0173	0.0026	0.0021	0.0039
Country quota	-1.1703	-0.0273	-0.5593	-0.0754	-0.0696	-0.0244
	0.8458	0.0742	1.4327	0.1768	0.1772	0.2187
IMF liquidity (t-1)	0.0013	0.0004	-0.0089	-0.0001	0.0000	0.0008
	0.0038	0.0005	0.0075	0.0011	0.0006	0.0009
Real LIBOR rate	-0.0014	0.0038	0.0199	0.0018	-0.0003	0.0108
	0.0274	0.0033	0.0540	0.0105	0.0045	0.0068
World GDP real growth	-0.1703	-0.0134	-0.3012	-0.0287	-0.0070	-0.0189
	0.0575 ***	0.0064 **	0.0852 ***	0.0129 **	0.0110	0.0165
Program in the last 2 years	-0.1591	-0.0183	-0.4900	-0.0573	-0.0346	-0.0561
	0.1094 ***	0.0129	0.1730 ***	0.0325 *	0.0197 *	0.0325
Time-Trend	-0.0050	0.0003	0.0049	0.0004	-0.0010	0.0004
	0.0025 *	0.0004	0.0078	0.0018	0.0005 **	0.0011
Number of Observations	3121	1549	1330	686	1199	649
Wald chi2	1767.63	899.18	783.08	419.67	834.68	449.88
P-value of Wald chi2	0.00	0.00	0.00	0.00	0.00	0.00
Wald test of Golbal Variables	11.57	4.36	17.95	6.57	0.73	2.44
P-value of Global variables	0.00	0.11	0.00	0.04	0.69	0.29
Wald test of Institutional Variables	1.98	1.03	1.43	0.19	0.16	0.65
P-value of Institutional variables	0.37	0.60	0.49	0.91	0.92	0.72

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