IMF PROGRAM PARTICIPATION: IS POLITICAL INFLUENCE SYSTEMATIC OR SELECTIVE?

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Abstract

What factors determine whether or not countries have programs with the International Monetary Fund (IMF)? The existing literature suggests that a number of economic and political variables may be important, but there is a disagreement about their relative significance. An increasingly popular view is that the pattern of IMF lending is politically driven and that in particular it reflects the interests of the United States. Using a mixture of quantitative and qualitative techniques, this study provides a detailed examination of the economic and political factors underpinning IMF program participation. It focuses on the significance and robustness of US strategic interests to determine whether any such influence is systematic or selective. In general we find that the importance of US political influence over program determination is less systematic than has sometimes been portrayed.

*Parts of this paper draw directly on Dimitrios Mylonas's 2011 MA research essay for the Norman Paterson School of International Affairs, which was written under the supervision of Dane Rowlands.

January, 2012

Introduction.

Since the collapse of the Bretton Woods system and the dismantling of its accompanying capital controls, the increasing integration of international financial markets has redefined how economic crises affect both national economies and the global economy. In response to this transformation the International Monetary Fund (IMF or Fund), as the world's pre-eminent international financial institution, has been called upon to support distressed economies and to ensure the stability of the global financial system. In answering this call, however, the Fund has encountered considerable criticism.

While critics often assail the nature and imposition of IMF loan conditionality,[1] criticism of the organization's governing structure is also abundant. Many contend that political influence from the International Monetary Fund's most powerful members seeps into its decision-making and undermines its technocratic credentials. More specifically allies and partners of the United States are suspected of receiving special treatment from the IMF. Allegedly, these alliances bring with them fewer and less controversial conditions, larger loan arrangements, and the initiation of programs despite the absence of a particularly compelling economic need for them. Our purpose here is to investigate the political and economic factors lying behind the initiation of Fund programs.

Using a rigorous empirical examination of the political economy variables that have been included in previous studies, we seek to discover the extent of US influence over

[1] Criticism of the Fund is primarily targeted at its conditionality or, more specifically, its approach to reforming structural deficiencies in distressed economies. See Dreher (2009) for a recent discussion.

participation in IMF programs. The lay out of the paper is as follows. We begin by offering a brief analytical framework within which the determination of participation may be conceptualized. We then go on to examine what the existing literature has to say about the potential determinants. Next, we present and estimate our own base model, but extend this by disaggregating it in various ways. In a concluding section we summarise some of our most important findings and briefly explore their implications for other aspects of research into the IMF.

2. Participation in IMF programs: an analytical framework.

Our purpose in this section is not to give a full and complete analysis of the theory underpinning participation in IMF programs. Such analyses have been provided by some of us elsewhere (Bird and Rowlands, 2006, and Bird, 2007). Instead, the section endeavours to offer a brief conceptual background to the empirical results that follow and to discuss the circumstances in which it may be anticipated that countries would be more and less likely to turn to the IMF for assistance.

Countries seem likely to contemplate turning to the Fund when their balance of payments becomes unsustainable. The causes of such unsustainability may be quite diverse. They will probably involve a combination of domestic economic mismanagement and the incidence of balance of payments shocks of one type or another. Economic mismanagement may take the form of excessive fiscal deficits that have been financed either by external borrowing leading to debt difficulties, or by monetary expansion leading to inflation and a loss of competitiveness. Shocks may emanate from the current account, with export shortfalls or import excesses, or the capital account, with sudden

stops in capital inflows. The underlying economic problems may sometimes be deep seated, enduring and difficult to correct in the short to medium term. On other occasions they may be temporary and almost self-correcting. It is therefore to be expected that some countries may have a long-lasting relationship with the IMF while others may be infrequent users of IMF resources.

Faced with an unsustainable balance of payments situation various responses are feasible in principle. These may incorporate different blends of financing, based for example on running down international reserve holdings, and adjustment, based on exchange rate changes and/or demand (and in some cases supply) management. A balance of payments strategy may be pursued outside the IMF or under its auspices. Some governments may be more inclined than others to seek IMF assistance in the form of a Fund program, although even those that are initially disinclined to follow this path may be forced to do so eventually as circumstances change with, for example, international reserves continuing to fall and adjustment policies failing to have a sufficiently quick impact on the balance of payments.

In determining whether or not to seek IMF assistance domestic politics seem likely to play a key part. Governments that have to confront powerful special interests that are opposed to referral, or that are approaching elections, may be less inclined to refer to the IMF, although, in principle, involving the Fund may enable them to gain access to resources that may be used to compensate the losers from IMF-backed reforms or to use the IMF as a scapegoat for politically unpopular measures. Different governments may have different attitudes towards national sovereignty over the design of economic policy, and this will influence their propensity to turn to the IMF.

Once the decision has been made to refer to the IMF, based on a contingent combination of the demand side factors discussed above, the IMF will have to determine its response. In principle, politics may play a significant role on the supply side as well. Relevant in this context is an understanding of how the IMF operates. Is a principal/agent model or a public choice one more appropriate, or might the Fund's operations reflect a combination of the two? If the principal/agent model is relevant, there is the further question of who the principals are. Are these international financiers (Gould, 2003), or are they the richer shareholders of the IMF (the advanced economies), or is the Fund's principal just the US alone?

There is little doubt that the US has the ability to exert considerable influence within the IMF. It retains an effective veto over key decisions affecting quota increases, SDR allocations, reforms to conditionality and IMF lending facilities and it can therefore exert a direct and overt influence over them. But it also possesses 'soft power' and the ability to exert its influence more indirectly and covertly. This may mean that the influence of the US over the pattern of IMF lending may be greater than that implied by simply voting against a particular program or abstaining on a vote.

Furthermore, the US Congress has given a clear idea of the broad direction in which it wants US influence at the Fund to be used. Annual reports produced by the Treasury Department for Congress reveal important insights into US attitudes at the Fund.[2] Among the fourteen specific provisions instructing US Executive Directors as to how they should function at the IMF, for instance, only five include technical economic guidance. The

[2] The Secretary of the Treasury is required by Section 610(a) and 613(a) of the *Foreign Operations, Export Financing and Related Programs Appropriations Act, 1999*, to report the USED's actions in relation to policies described in Section 610 of the Act.

other nine provisions offer a variety of instructions that address the following topics: democratic governance; social stability; corruption and bribery; social equity; labour standards; ethnic strife; environmental conditions; and assistance to heavily indebted poor countries. Additional Treasury Department reports to Congress also reveal that these legislative guidelines are followed closely by the USED. But does this mean that 'partners and allies' of the US receive favourable treatment, and in what sense may favouritism be revealed? In many cases, and in various aspects of the Fund's operations, the US may not detect any special interest, and in these circumstances decisions may in effect be delegated to the Fund's management. There may, however, be occasions when the US does perceive itself as having a special interest. These may, for example, relate to the design of the international monetary system affecting the future of the dollar as an international reserve currency, or to individual programs. In these cases the US may opt not to stand back. Of course even where the US does not become actively involved, the Fund's management will have a clear idea of US preferences and this may well affect the positions they adopt. Similarly, country governments will also have an idea of US attitudes and this may influence the decision as to whether or not to refer to the Fund. There may be an element of self-selection on the demand side, reflecting the assumptions made about the supply side.

Where does this discussion leave us? It might be imagined that there will be some reasonably common features, such as deep-seated debt difficulties, that are associated with IMF participation. Since often these cannot be resolved quickly, the implication is that many countries will have an on-going relationship with the IMF; one program may follow shortly after another. However, there may also be some countries where it is a

short term and reversible shock that exposes economic vulnerability and, in these cases, IMF referral may be only occasional and infrequent.

In terms of the underlying determinants of participation in IMF programs, it seems likely that there will be a reasonably well-established list of economic and political factors covering both the demand and supply sides that could be potentially significant, and it will be contingent combinations of them that are at work in particular cases. There are also likely to be differences in the relative significance of these factors across time periods, across regions, across income groups as well as across individual countries. The causes of balance of payments difficulties may, for example, differ between low income and emerging economies. In some cases, domestic politics may be conducive to an agreement but in others may provide an effective short term constraint. International politics may also favour some programs more than others, or may, on occasions, have little role to play. This implies that large sample estimation will struggle to come up with one universal model of IMF participation with strong explanatory powers. It may instead be anticipated that different empirical studies based on different samples may discover different results.

There is a further implication that follows on from this. If the relevant participation model varies significantly across samples, studies that set out to test the effects of IMF programs using a general participation model may fail to deal adequately with selection bias, and may therefore generate insecure results because the relevant participation model is mis-specified.

2. What do existing studies of IMF participation show?

There is an extensive literature that looks either directly or indirectly at the allocation of IMF programs. Our focus here is on the large sample quantitative studies since we are seeking to discover the extent of any systematic influence. Useful reviews of the literature may be found in Bird (2007), Steinwand and Stone (2008) and Moser and Sturm (2011).

Our focus on large sample studies is not meant to understate the importance of small sample investigation and individual case studies. There have been many examples described in Swedberg (1986), Finch (1989), Stiles (1991), Meltzer (2000) and elsewhere that demonstrate the presence of primarily US influence on Fund operations. But our interest is in seeking to discover the extent to which this influence is systematic rather than selective. To address this issue a large sample quantitative approach is more appropriate.

Most of the early quantitative studies focused on the country-level economic conditions associated with IMF programs. Bird and Orme (1981) provided the first examination and perhaps presciently concluded that a more nuanced analysis with greater attention to socio-political factors was needed. Numerous studies followed but continued to focus on economic determinants (Cornelius,1987, Joyce, 1992, Conway, 1994, Rowlands, 1995, Santaella, 1996, and Knight and Santaella, 1997). These papers highlighted factors such as balance-of-payments performance, international reserve cover, gross domestic product (GDP) growth, external debt and debt service, inflation, the fiscal balance, and a country's domestic credit to the government. Though a consensus of sorts began to form around the economic dimensions of the basic model, even straightforward elements, such as reserve depletion, could in theory have a rather complex relationship with IMF programs (Bird and Rajan, 2002).

However, some researchers examined political variables such as US military aid and political conditions in the borrowing countries (Rowlands, 1995). A consistent finding was that a history of frequent engagement with the IMF did much to explain future involvement. This variable was in turn interpreted as incorporating unobserved effects, such as IMF institutional inertia, or the notion of a political threshold to IMF involvement where once the Fund has become involved in a country, the fixed domestic political cost has already been incurred and may therefore not influence subsequent decisions. A developing relationship between the country officials negotiating programs and IMF staff may also facilitate subsequent programs.Yet the studies exhibited a rather depressing inability to identify a single uniform model that was able to explain the pattern of IMF programs substantially better than a straight guess of 'no agreement', which was correct roughly 80-85 percent of the time, depending on the sample. Rarely, if ever, did the percentage of correct predictions exceed 90 percent.

The challenge of finding a better model was generally taken up by researchers who concentrated on the domestic political and economic conditions of potential Fund clients.[3] In this vein, Vreeland (1999), and Przeworski and Vreeland (2000, 2002) introduced more rigorous modeling and estimation of the domestic political determinants of IMF agreements. While the studies generally reinforced previous results in terms of the significant economic variables, it was found that countries were more likely to seek an IMF program reasonably shortly after elections had taken place.

[3] There were several other researchers who pursued the path of developing more sophisticated economic models. Elekdag (2006) for example emphasizes global economic conditions such as oil prices, world interest rates, and GDP, while Gunduz (2009) emphasizes the link between economic shocks and the more specific use of individual IMF facilities.

The international relations literature was exemplified by Thacker (1999). Researchers had become interested in the use of UN voting similarities as a measure of foreign policy alignment (Voeten, 2000). Thacker's operationalization of the idea focused on whether a country voted in a manner similar to that of the US on United Nations (UN) resolutions deemed to be of importance to the US. More specifically, his interest was in whether a country's voting record became more aligned with the US vote over time and whether this affected its access to IMF resources. Thacker's conclusion was that this measure of US foreign policy interests had a statistically significant coefficient estimate that was robust over both the Cold War and post-Cold War periods of his 1985-1994 sample. Although Thacker was himself somewhat cautious about the interpretation of his results, and others were concerned about the lack of underlying theory (Woods, 2003), his paper marked an important turning point in the literature.

It is unsurprising that Thacker's results spawned a number of other studies investigating US influence. Bird and Rowlands (2001) concluded that many basic political economy variables failed to improve the explanatory power of the economic model of IMF agreements, and that the inclusion of US trade flows also failed to provide evidence of strategic influence. They also concluded that some of Thacker's results were sample specific. Oatley and Yackee (2000, 2004) found that countries to which US banks were heavily exposed were treated more favourably by the IMF, though the coefficient estimate on UN voting proximity was only marginally significant. In their probit regression of 24 developing countries, Eichengreen et al (2004) found that UN voting affinity with the United States was a statistically significant indicator of signing a Fund program (at the 1 percent threshold). However, the variable was signed 'incorrectly' – a

country that did not support American voting positions at the UN on key votes was *more* likely to receive IMF financing. Stone (2008) sought to capture US interests by using foreign aid allocations, and found that countries that received relatively large amounts of US foreign aid were significantly more likely to have an IMF program; by contrast he found that UN voting had no apparent influence.

Barro and Lee (2005) examined not only UN voting coincidence with the US but also similar UN voting proximity variables and trade variables for the UK, Germany, France and Europe as a whole. Of these, only the UN voting affinity with Europe, and the US trade variables had statistically significant coefficient estimates in their fully specified model. Copelovitch (2005) also extended the focus beyond US influence, finding that Group of Five (G5) bank exposure increased the amount of financial support offered, though the coefficient estimate for US military aid was statistically insignificant. These findings were supported by Broz and Hawes (2006) who found that US and German bank exposure were linked to higher IMF participation rates; though again there was no connection to UN voting affinity with US or European interests. Breen (2010) also emphasized G5 banking exposure with results that were consistent with those of Copelovitch (2005). While Sturm et al (2005) could not replicate Copelovitch's results for bank exposure, they did find that IMF participation was affected by executive elections, legislative elections, the percentage of veto players who drop from the government, and the presence of ethnic tensions. Ghosh et al (2007) did not find any significant relationship between US or Western European foreign policy variables and IMF lending. In short, results from many of the studies were inconsistent. This led to attempts to capture and reflect political influence in new and more complex ways.

For example, Anderson et al. (2006) attempted to capture a country's true preferences, or 'bliss point', by examining their voting patterns on non-key resolutions at the UN. The hypothesis was that countries were rewarded with IMF resources for subjugating their preferences when there were key votes of importance to the US. A measure of the gap between voting with the US on key resolutions versus non-key resolutions yielded a statistically significant coefficient estimate but it also had the effect of eliminating the explanatory power of Thacker's measures of voting proximity.

Dreher, Sturm and Vreeland (2006, 2009, 2011), extended the literature by examining whether United Nations Security Council (UNSC) membership affected a country's relationship with organizations such as the Fund. Their results indicated that UNSC membership led to a greater likelihood that an IMF member would receive a Fund arrangement during their period of tenure; although this effect was less important after the Cold War.

Contrasting results were, however, found by Reynaud and Vauday (2009) who constructed a 'geopolitical potential' variable to measure a country's geopolitical importance. The variable's components included energy resources, nuclear energy endowment, military power, and geographic size. Their geopolitical potential variable was found to be statistically significant in all specifications, while the UN voting variable was significant in only one specification, and the UNSC membership indicator was never significant. Disaggregating a part of their study by program type also revealed that geopolitical factors seemed to be most important when non-concessional loans were being disbursed.

Insights from disaggregation were also provided by Pop-Eleches (2008, 2009) who estimated participation equations for different regions and time periods. In terms of political influence, he found that voting alignment with the United States at the UN only seemed to matter for post-Soviet countries following the collapse of the Communist bloc, whereas American foreign assistance was important only for Latin American countries from 1990 to 2001. Similarly, Bird and Rowlands (2009) disaggregated their sample by per capita income and concluded that even the economic factors driving participation in IMF programs differed significantly between low income and middle income countries.[4]

Finally, Moser and Sturm (2011) make an important contribution to our understanding of the post-Cold War participation of countries in IMF programs by using a variety of statistical techniques to identify the variables that exert a statistically significant and robust effect on IMF agreements. Among their important observations is the need to distinguish between concessional and non-concessional arrangements, as well as the relatively greater role political variables play in influencing program conditions rather than program participation.

These results are, however, somewhat at odds with Steinwand and Stone's (2008) overall conclusion that "one of the most robust findings that emerges from the new focus on political determinants of IMF lending is that program initiation is significantly shaped by the geopolitical preferences of the countries that contribute the most resources, particularly the United States" (p129).

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[4] Bird and Rowlands (2006) also make the case for disaggregation, particularly by income group. Boughton (2001) describes the institutional evolution of Fund agreements, suggesting that the factors associated with signing a Fund agreement are likely to change significantly over time. Bird and Rowlands (2011) provide an analysis of aggregate IMF lending, presenting it as episodic and unpredictable.

Given such conflicting evidence and interpretation, the objective of this paper is to provide a more detailed examination of the evidence and logic regarding the importance of political – especially geopolitical – variables for estimating the propensity of countries to sign IMF agreements. We examine *four* specific questions.

1. How sensitive are the results of a basic participation model to the specification of program eligibility?

2. Is it important to distinguish between relatively rich and poor countries, or between concessional and non-concessional IMF programs?

3. Are the results stable across different time periods and regions, or do different explanations apply at different times and in different parts of the world?

4. What additional evidence is there for the proposition that geostrategic interests have a significant effect on the allocation of IMF agreements?

We take two approaches. First, we conduct a reasonably standard large-sample probit analysis of IMF program signings. Second, we briefly examine the performance of the probit equations to see if their implications align with the evidence about institutional behaviour.

4. New large sample evidence on IMF participation.

We begin by specifying a base probit model that incorporates both economic and political variables as determinants of a country's propensity to sign an IMF agreement, but with an emphasis on geostrategic factors. We then introduce a variety of permutations of this model in an attempt to answer the questions posed at the end of the last section.

The base probit model is estimated using an unbalanced panel of 1632 observations for 114 countries over the years 1984-2008. The choice of explanatory variables is based on our earlier conceptual discussion and on the results of previous studies. Variables which did not generate statistically significant coefficient estimates were dropped from the estimation in order to maximize the sample size. While not exhaustive or comprehensive, the model is reasonably representative of past efforts to capture the determinants of IMF participation, and the results are largely robust to minor variations in the estimating equation. Appendix 1 provides a fuller discussion of the basic variables and the hypotheses that typically link them to IMF program participation. [5]

Subsequent steps in the paper estimate this base model for different sample specifications or versions of the key variables. The use of a disaggregated approach allows us to reduce the chances of specification error, as the robustness of each variable is tested in numerous ways. It also helps us to identify the sub-samples that seem to be driving the general results. Furthermore, it allows us not only to paint a more accurate picture of IMF program participation, but also to investigate the extent to which evaluations of the effects of IMF programs effects may be unreliable as a consequence of using inappropriate selection equations.

Four observations regarding the base model should be noted from the outset. First, running the estimation using a model that has only past IMF agreements yields a pseudo R^2 value of 0.1397 on a sample of 3213.[6] Since the interpretation of this variable is

[5] See Appendix 2 for summary statistics.

[6] Various pseudo R-squared goodness-of-fit measures have been used and criticized in the econometric literature (see Windmeijer,1995, for a good investigation into the various methods). However, to avoid being drawn into this debate the conventional pseudo R-squared measure is used throughout this study.

unclear, we test whether it is linked primarily to the need to roll over IMF debt. While our results suggest that this may indeed be an important factor in serial IMF programs, it does not fully explain the effect of past IMF programs on subsequent ones.

Second, by way of comparison, one version of our base model that could be estimated on a larger sample size of 2557 observations yielded a pseudo R^2 of 0.20, considerably above the 0.11 reported by Moser and Sturm (2011) for a slightly larger sample of 2753 observations. Clearly there is room to improve some of the existing models.

Third, our preferred base model generates a pseudo R^2 of just over 0.21 on a sample of 1632 observations. This level of explanatory power is high relative to most of the equations reported in the existing literature, and suggests that our base model is relatively well designed.

The results of the base model appear in the first results column of Table 1 (below). In testing for multicollinearity, only the election variables were problematic. Removing them, however, did not significantly affect any of the results (last column in table 1). We therefore retained them in our base model estimations.[7]

TABLE 1 HERE

In constructing the base model, several political variables were tried before arriving at the final specification used. The variables included US economic aid, USAID aid, US State Department aid, US military aid, total G5 aid (including testing each G5 country individually), total G5 exports (including testing each G5 country individually), total G5

[7] It should also be noted that the results of this model were effectively unchanged when the equation is estimated using a random effects model.

imports (including testing each G5 country individually), G5 bank exposure (including testing each G5 country individually), numerous variations of UN voting coincidence on key votes, membership on the UN Security Council, presence of coups, democracy and autocracy measures, the timing of elections, and various levels and changes in levels of Freedom House measures of civil and political freedom. Our results suggest that previous conclusions regarding the importance of these political variables may not be very robust. While we cannot definitively reject their potential influence, the statistical insignificance of their coefficient estimates in a model with more observations and higher overall explanatory power suggests that the influence of these factors is far less systematic than has sometimes been suggested.

From the above list, political variables were included in the base model where they generated statistically significant coefficient estimates. These were the one-year lagged versions of UN voting similarities with the US, US economic aid, elections (both legislative and executive) and trade links with G5 countries.[8] The first two of these corroborate the idea that there is a higher likelihood of IMF agreements for countries with favourable links to the US. Recent elections are also associated with a higher propensity for a country to sign an IMF agreement. Higher trade links with G5 countries in the form of exports to them are associated with a lower probability of an IMF agreement, but this seems more likely to reflect the impact of economic conditions rather than political ones.[9]

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[8] Mylonas (2011) conducts similar analysis using a model without the election variables in order to retain a larger sample size. The results reported in this paper are qualitatively similar to those that he reports.

[9] Although the level of G5 exports to a country would be the most likely trade variable to create G5 political support for a program, not G5 imports from a country our results showed this to be statistically insignificant. This finding counters political economy explanations offered by Breen (2010), Pop-Eleches (2009), and Broz and Hawes (2006).

In terms of the more conventional economic variables, a reasonably typical story emerges from the base model. Higher propensities to enter a Fund agreement are linked to higher indebtedness to the IMF (separate from recent programs), high global agricultural prices,[10] high debt service burdens,[11] current account deficits in excess of 3 percent of GDP, and the presence of debt arrears to private creditors.[12] By contrast high global oil prices, high international reserves, high rates of economic growth, high average income levels and arrears to official creditors, are linked to lower propensities to enter into IMF agreements.

Our next task is to investigate the results of our base model in more detail using a greater degree of disaggregation, and with a view to answering the questions identified earlier.

i) Model specification: program eligibility.

Our first test relating to model specification investigates the extent to which the results are affected by failing to exclude countries that are ineligible to sign an agreement. Many studies are silent on this issue. Ignoring ineligibility allows our base model sample to

[10] The price of metal (as a primary resource used in industrial production) was also tested but found to have a statistically insignificant estimated coefficient. We also created a commodity price variable which included oil, agricultural, and metal prices; this variable has a statistically significant coefficient estimate but the effect was not as pronounced, which is why the oil and agricultural variables are used separately. Cerutti (2007) makes a strong case for the inclusion of global economic factors in a model of IMF agreements.

[11] Other debt variables were used as well, but ultimately dropped as they had statistically insignificant coefficient estimates in the final model. Two variations of the external debt stock and service variable were tested according to previous examinations. These include: public and publicly guaranteed (PPG) long- and short-term debt; and private nonguaranteed long- and short-term debt (PNG). Debt rescheduling indicators were also used, but again were not found to be statistically important in the final estimations despite their institutional connection to Paris and London Club rescheduling. In related work, Mylonas (2011) found debt rescheduling variables to be important factors in determining LIC participation in IMF programs.

[12] Of five studies that examined how a country's arrears influences its propensity to initiate an arrangement, however, only Rowlands (1995) finds any statistically significant results. This finding is consistent with political economy arguments such as those offered by Gould (2003).

increase by almost 600 cases and, unsurprisingly, the pseudo R^2 drops from 0.2122 (on 1632 observations) to 0.1044 (on 2203 observations). While it is impossible to determine whether the drop in explanatory power is due solely to the change in the sample, we can gain some insights by examining the pattern of predictions. For the base model, the ratio of countries predicted to sign an agreement which actually sign one, relative to those that do not, is 0.55. This number implies that there are many countries signing agreements that are not predicted to do so by the model. The ratio declines sharply to 0.03 when the sample includes ineligible countries. Failing to correct the sample substantially increases the rate of false positives generated. In short, the model is predicting that countries will sign an agreement when they do not because they already have one.

ii) Model specification: disaggregation by country income and program type.

Our second test examines the extent to which the participation model differs between countries with different levels of national income. Table 2 presents the results of the base model when the sample is disaggregated across higher middle income countries, lower middle income countries, and low income countries. Looking across the different sub-samples, a few observations may be made. First, some groups of variables that are statistically significant in the full sample do less well when the sample is disaggregated by income. Specifically, most global economic variables, elections, and arrears have statistically insignificant estimated coefficients, and this calls into question their robustness.

Second, there are a number of common influences across the samples, including past connections with the IMF (though indebtedness to the Fund seems less important for poor

countries), US economic aid, and debt-service burdens. At the same time, the lower middle income group shares a statistically significant estimated coefficient on the UN voting variable with richer countries, and sensitivity to excessive current account deficits and income levels with poorer countries. Only high middle income countries have signing propensities that seem to be affected by reserve levels and economic growth. So, while there are differences across the models suggesting that separate estimation may be useful, it is unclear whether low middle income countries are best included with the poorer or wealthier countries in the sample.

TABLE 2 HERE

The base model's overall performance also varies widely across the sub-samples, with a pseudo- R^2 ranging from 0.38 for the higher middle income group, to 0.26 for the lower middle income group, and 0.14 for the low income group. Thus the biggest challenge seems to be in estimating the signing of IMF programs for low income countries. Bird and Rowlands (2009) also encounter more difficulty in statistically explaining the involvement of low income countries with the Fund.

The political variables we identify perform relatively well when the sample is disaggregated by income. While the estimated coefficients indicate some sensitivity to disaggregation, US economic aid is robustly associated with IMF agreements. Aligning with the US on key votes at the UN also seems to improve the odds of middle income countries (both higher and lower) signing an IMF agreement. Recent elections are uniformly positively correlated with signing propensities, and the associated coefficient estimate occasionally approaches statistical significance.

As an alternative approach to dealing with differences in income levels, many researchers have also differentiated between concessionary (SAF, ESAF and PRGF facilities) and non-concessionary (SBA and EFF facilities) arrangements. Table 3 shows our results for the base model using this distinction.

There should be some similarities to the income based samples, since concessionary programs are available only to low income countries. In fact, the base model does reasonably well overall in estimating both types of programs, although as noted in Bird and Rowlands (2007) the specific determinants appear relatively distinct. Indeed, aside from a few key variables (history with the IMF, and debt service burdens), if the coefficients for the variables are significant in estimating one type of program, they are not significant in explaining the other type. For income per capita, the estimated coefficients are both statistically significant, but of opposite sign.[13] This result suggests that there may be an important non-linearity in the relationship between country income levels and IMF participation.

TABLE 3 HERE

In terms of the political variables, the non-concessionary SBA and EFF programs seem far more susceptible to the influence of US interests (a result confirmed by Anderson et al, 2007) and to that of executive elections. By contrast, the signing of concessionary programs is relatively immune to any apparent geopolitical interference, but is positively correlated with recent legislative elections. An important conclusion from this analysis is

[13] We also estimate the signing of these two program types on narrower samples of all middle income countries for non-concessional programs, and low middle and poorer countries for concessional programs. The results are essentially the same as those reported in Table 3.

that concessionary programs are not simply the poor countries' versions of non-concessionary programs. Participation in different types of IMF program appears to be driven by different factors.

iii) Model specification*: *stability over time and across regions.

Our third test explores the stability of the political influences over time and across regions. While we conducted numerous sub-sample estimations, in the results reported here we focus on three time periods: the 1980s, the 1990s, and post 1999. We also examine six regions.

Using the decades we choose is convenient in part to provide some balance in tracing the evolution of participation, but, more importantly, because the selected decades were dominated by certain political events. The 1980s represents a period when there was the Third World debt crisis, the Cold War and a Republican President in the United States. The 1990s represent the immediate post Cold War period, with the larger part of the decade having a Democratic President in the White House. The new millennium is dominated by a Republican presidency in the United States and the associated 'War on Terror'. Table 4 presents our estimation results.

Past IMF programs, high debt service burdens, and US economic aid are all statistically significant across all three time periods. The base model best fits the 1980s, when executive elections, large current account deficits, and the presence of private arrears were also all positively correlated with the signing of IMF programs. The model fits the 1990s least well, when UN voting alignment with the US, legislative elections, low reserves and the absence of official arrears were associated with IMF participation.

Finally, since the end of the last millennium, low crude oil prices, low exports to G5 countries, and higher income levels are all associated with a greater likelihood of signing an IMF agreement. There is still a (less significant) connection with UN voting proximity and US economic aid during this period. It is interesting to note that it is during the 1990s that the geostrategic interests of the United States are perhaps at their most influential.

TABLE 4 HERE

Finally, we investigate trends in IMF signings more generally by re-estimating the base model with time dummies. There is weak evidence that the probability of signing an IMF agreement increases slightly over time for the sample period. However, the associated coefficient estimate is statistically significant only at the 0.09 level.

The regional estimations for the full time period can be summarized briefly. [14] There is wide variance across the R^2 values for the six regions, although this goodness of fit measure is closely and negatively associated with sample size. Table 5 summarizes the base model's performance and identifies the key political variables that affect IMF participation.

TABLE 5 HERE

Over the full sample period, the different regions exhibit significant differences in terms of the explanatory variables that are statistically significant. In terms of the political variables, South Asia and the Americas are the two regions that seem most affected by US geostrategic interests, as captured by US economic aid. The results for Africa indicate

[14] Harrigan et al (2006) provide an example of a regionally focused study, having examined program participation in this Middle East. Our emphasis here is on comparisons across regions.

that US geo-strategic interests are only marginally important (significance levels between 0.05 and 0.10). However, domestic legislative elections are more strongly associated with subsequent IMF program participation.

Finally, our most disaggregated estimations are conducted on country groups (low and middle income) and regions for the three different time periods. The results for the political variables are summarized in Table 6.

TABLE 6 HERE

These results should be regarded with some caution, as the sample sizes are generally fairly small, and, in some cases, had to be extended beyond the ten years of a decade in order to permit the estimation to converge.[15] Not surprisingly, the estimations exhibit a high degree of inconsistency and variability across time and regions. Model performance varies widely, and the coefficient estimates for individual political (and often economic) factors not only alter across estimations, but they often fail to present a coherent pattern. For example, for the Middle East and North Africa region, no political variables emerge as having statistically significant coefficient estimates in the full-period sample, although this is not true for all the sub-periods. Similarly, for Sub-Saharan Africa, the UN voting and US economic aid variables have weakly significant coefficient estimates in the full sample, but they never attain this status in any of the individual sub-periods.

[15] Even relatively small changes in the model yielded slightly different results. For example, Mylonas (2011) used similar models with slightly different explanatory variables and associated sample changes due to missing variables. While some of his results are identical, others vary slightly across the most disaggregated region-period samples reported in table 6.

To investigate geopolitical interests further, we re-estimated our disaggregated models using a measure to capture the change in the way a country's UN voting aligns with that of the US. This enabled us to test Thacker's (1999) hypothesis. We found that his results only hold true for a restricted time period around 1990, and only for Latin America and the Caribbean in the 1990s, and Eastern Europe and Central Asia from the late 1980s to the mid-1990s. [16] In fact, the UN voting change variable has a weakly significant but *negative* coefficient for East Asia and the Pacific for the 1990s. We explore this result further in the next section. [17]

From the above analysis we conclude that the large sample evidence on the signing of IMF agreements is rather unstable. The influence of specific political (and economic) variables appears to be selective rather than systematic. Defining a stable large sample model is highly problematic; in some instances a variable may have a significant coefficient estimate for some parts of a sample or for certain agreements, but not for others. Suggesting that there is a single 'correct' estimating equation, therefore, is simply wrong.

However, our results do not lead only to a negative conclusion. A reasonably robust model actually appears to lose very little explanatory power even when variables with fairly consistent coefficient significance are dropped. For example, the base estimation

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[16] Pop-Eleches (2009) also tested UN voting proximity and movement variables in a disaggregated model but the study focused specifically on Eastern Europe during the 1990s, and Latin America from 1982 to 2001. He found that UN voting only matters for Eastern European countries following the Cold War.

[17] We also tested for the impact of United Nations Security Council (UNSC) membership, which Dreher et al (2006, 2009, and 2011) show to be a statistically significant factor in explaining IMF agreements. In our analysis, the variable is not statistically significant, and in Mylonas (2011) the variable's coefficient estimate was incorrectly signed in all the specifications and only statistically significant in the middle-income group (at the 5 percent level).

we report retains an R^2 value above .2 (compared to the full model R^2 of 0.2122) following the removal of any single variable, except past IMF programs (where the R^2 drops to 0.1672) and the debt service burden (where the R^2 drops to 0.1911).[18] The main message, therefore, may be that if we want better equations for predicting the pattern of participation in IMF agreements, we may need to look more carefully at whether theory can direct us towards more fundamental changes in our estimating equations and techniques. Being too concerned about the inclusion or exclusion of any specific single variable is probably unwarranted.

5. Type II error and the probability of signing an IMF agreement.

Our final approach to investigating the large sample results in more detail involves examining the predictions of our model.[19] Of specific interest is whether the model is relatively weaker at predicting the presence or the absence of agreements, and how this pattern is influenced by the inclusion or exclusion of political variables. If the US is able to use its power at the IMF to impose its views, it should be able to prevent any country it deems undesirable from receiving IMF assistance, while ensuring that any preferred country receives support.

Of the 511 agreements signed in the sample, there are 49 instances of a country obtaining an IMF program despite having voted with the US less than 25 percent of the time in both the current and preceding year. In fact, there are 18 instances of signings where a country

[18] Some preliminary analysis also suggests that the implications for selectivity bias are also relatively mild. Our results from a treatment effects model of the response of capital flows to IMF agreements indicates that the core results are largely unaffected by moderate changes in the selection equation (Bird and Rowlands, 2011).

[19] Bird and Rowlands (2002) use this approach.

voted with the US fewer than 10 percent of the time, and 13 cases where countries never voted the same as the US on key votes. Was it that these countries had a particularly compelling need for IMF resources on the basis of their economic situation? To test this, we calculated the predicted probability of signing an agreement using models both with and without political variables. We find that in either case the average estimated probability of an agreement is actually lower for the signing countries that did not ever vote with the US (.33) than for those that voted with the US more than 50 percent of the time (0.41). Political affinity with the US does not seem to make an IMF program more likely.

But what if the US only exercises its influence to assist its 'close' friends? There are seven cases in our sample where the predicted signing probability was above 0.75 (which is relatively high) but the country concerned did not have a program with the IMF despite voting with the US more than 60 percent of the time. For some reason these countries were not rewarded with a program even though they had an apparently strong case for one on conventional economic grounds, and even though they were apparently closely allied with the US.

Our results confirm those reported more fully by Mylonas (2011) who uses the type I and type II results from disaggregated estimations. He concludes that, at least for certain regions, the addition of the UN voting variable does not reduce the error rate of predictions in a manner consistent with the US influence hypothesis. In fact, in his analysis of the 2000 - 2008 period, there were only four cases out of the seventeen false negative results in which the UN voting variables had a value of at least one standard deviation above the mean, while the value was below the mean for seven of these cases.

Again, these results call into question the extent and universality of US influence over program participation.

6. Concluding remarks.

The objective of this paper was to expand our understanding of participation in IMF programs by undertaking a detailed and disaggregated empirical investigation based on a broad conceptual framework. We draw the following conclusions from our analysis. First, explanatory variables found to be associated with participation in IMF agreements rarely exhibit the kind of robustness we would like to see for a canonical model. While some variables, such as past IMF program exposure and debt service burdens, perform reasonably well in most models and across different samples, many variables display too much inconsistency to generate a truly convincing overall model. Instead, we may have to be satisfied with a fairly broad set of factors that are in some cases, rather than consistently, correlated with the propensity to adopt an IMF program.

A second observation that follows on from this is that it is important to bear in mind the theory that lies behind the signing of an IMF agreement in order to make sure that the basic form of the estimating equation is analytically reasonable for the purpose at hand. Many results are specific to the sample used. However, our analysis also suggests that the problem of omitted variables is probably not as critical as might be assumed, and that the consequences of failing to fully correct for selection in studies that set out to evaluate the effects of IMF programs are not severe, for as long as the estimating equation is generally reasonable.

A third observation is that the influence of US foreign policy interests suffers from the same general inconsistency in sub-samples that is observed with several other explanatory variables. The more detailed evidence suggests that there is no systematic connection between voting with the US at the UN and receiving an IMF program even though much has been made of this relationship in the existing literature. While US influence may be exhibited in other ways, such as the number and nature of program conditions and the size of loans, it appears from the data that the manipulation of IMF activity may be a poor mechanism for enforcing US interests.

Finally, although we discover that one model of participation in IMF programs does not fit all, we have also identified a base model that, when judged by a standard measure of fit, provides a generally superior explanation to those reported elsewhere in the literature.

TABLE 1: Base model Probit regression of the probability of entering an IMF program*

Explanatory Variable (all lagged one year)	Base Model		Base model without elections, but same sample as base model	
IMF variables				
Past IMF program	0.757***	(8.76)	0.784***	(9.19)
IMF debt/GDP	2.07**	(2.33)	2.09**	(2.36)
Global Economic Variables				
Crude oil prices	-0.00778**	(-2.55)	-0.00756**	(-2.53)
Agricultural prices	0.00773***	(2.99)	0.00802***	(3.12)
Exports to G5 countries	-0.0000128*	(-2.20)	-0.0000127*	(-2.21)
Political Variables				
UN voting proximity	0.466***	(2.85)	0.488***	(2.97)
US economic aid	1.79***	(4.74)	1.81***	(4.77)
Legislative election	0.226**	(2.29)		
Executive elections	0.261*	(2.22)		
Domestic Economic Variables				
Debt service to exports ratio	1.54***	(6.34)	1.51***	(6.21)
Current account/GDP < -0.03	0.307***	(3.77)	0.318***	(3.94)
Reserves to months of imports	-0.0477***	(-2.77)	-0.0466***	(-2.71)
Real per capita GDP growth	-0.0123*	(-2.01)	-0.0134*	(-2.19)
Real per capita GDP	-0.0000409***	(-2.56)	-0.0000359**	(-2.29)
Official arrears	-2.21×10^{-10}*	(-1.97)	-2.09×10^{-10}	(-1.77)
Private arrears	1.13×10^{-10}**	(2.36)	1.20×10^{-10}***	(2.57)
constant	-2.24***	(-7.56)	-2.23***	(-7.62)
Sample size	1632		1632	
Pseudo R^2	0.2122		0.2017	

The z-statistics appear in parentheses. ***, **, * identify coefficient estimates that are significant at the 1, 2.5 and 5 percent one tailed test levels of significance. Errors were estimated using robust estimation for general heteroscedasticity.

TABLE 2: Base model Probit regression of IMF program signing, by income group

Explanatory Variable (all lagged one year)	Higher middle-income		Lower-middle income		Low income	
IMF variables						
Past IMF program	0.748***	(3.36)	0.669***	(4.62)	0.358**	(2.30)
IMF debt/GDP	15.1***	(3.05)	4.70*	(2.18)	1.50	(1.19)
Global Economic Variables						
Crude oil prices	-0.0137	(-1.83)	-0.00349	(-0.78)	-0.00301	(-0.51)
Agricultural prices	-0.00695	(-0.91)	0.0143***	(3.42)	0.000684	(0.17)
Exports to G5 countries	-0.0000129	(-1.87)	-0.0000167	(-1.40)	-0.0000286	(-0.87)
Political Variables						
UN voting proximity	0.908*	(2.06)	0.533*	(2.02)	0.112	(0.41)
US economic aid	1.97***	(2.66)	4.13***	(3.03)	7.59***	(3.02)
Legislative election	0.259	(1.21)	0.190	(1.25)	0.278	(1.52)
Executive elections	0.409	(1.63)	0.046	(0.24)	0.377	(1.74)
Domestic Economic Variables						
Debt service to exports ratio	2.28***	(4.27)	2.25***	(4.68)	1.096***	(2.71)
Current account/GDP < -0.03	0.250	(1.42)	0.260*	(2.01)	0.328*	(2.22)
Reserves to months of imports	-0.104***	(-2.93)	-0.0531	(-1.68)	0.00243	(0.06)
Real per capita GDP growth	-0.0434***	(-2.70)	-0.0149	(-1.39)	0.00452	(0.54)
Real per capita GDP	-0.0000354	(-0.79)	-0.000117***	(-3.04)	-0.000336**	(-2.48)
Official arrears	-4.51×10^{-10}	(-1.62)	-1.69×10^{-10}	(1.31)	1.25×10^{-10}	(0.39)
Private arrears	1.14×10^{-10}	(1.81)	7.17×10^{-11}	(0.68)	-3.90×10^{-10}	(-0.39)
constant	-0.819	(-0.91)	-2.92***	(-5.36)	-1.29**	(-2.51)
Sample size	418		740		474	
Pseudo R^2	0.3778		0.2634		0.1355	

The z-statistics appear in parentheses. ***, **, * identify coefficient estimates that are significant at the 1, 2.5 and 5 percent one tailed test levels of significance. Errors were estimated using robust estimation for general heteroscedasticity.

TABLE 3: Base model Probit regression of IMF program signing, by program type

Explanatory Variable (all lagged one year)	Non-concessional programs		Concessional programs	
IMF variables				
Past IMF program	0.731***	(7.18)	0.477***	(3.99)
IMF debt/GDP	0.960	(1.05)	1.23	(1.37)
Global Economic Variables				
Crude oil prices	-0.0114***	(-2.76)	-0.00146	(-0.37)
Agricultural prices	-0.00259	(-0.89)	0.0146***	(4.50)
Exports to G5 countries	-0.00000771	(-1.86)	-0.000146***	(-3.05)
Political Variables				
UN voting proximity	0.895***	(4.70)	-0.0508	(-0.23)
US economic aid	1.62***	(3.68)	-1.43	(-1.10)
Legislative election	0.103	(0.92)	0.279*	(2.08)
Executive elections	0.274*	(2.13)	0.210	(1.31)
Domestic Economic Variables				
Debt service to exports ratio	1.63***	(6.56)	0.757**	(2.55)
Current account/GDP < -0.03	0.150	(1.66)	0.293***	(2.65)
Reserves to months of imports	-0.0535***	(-2.82)	-0.0387	(-1.44)
Real per capita GDP growth	-0.0216***	(-2.91)	0.0124	(1.77)
Real per capita GDP	0.0000578***	(3.54)	-0.000250***	(-4.55)
Official arrears	-1.64×10^{-10}	(-1.01)	-2.57×10^{-10}**	(-2.52)
Private arrears	1.23×10^{-10}**	(2.53)	-2.80×10^{-10}	(-1.07)
constant	-1.98***	(-5.85)	-2.40***	(-6.40)
Sample size	1632		1632	
Pseudo R^2	0.2275		0.2800	

The z-statistics appear in parentheses. ***, **, * identify coefficient estimates that are significant at the 1, 2.5 and 5 percent one tailed test levels of significance. Errors were estimated using robust estimation for general heteroscedasticity.

TABLE 4: Base model Probit regression of IMF program signing, by income group

Explanatory Variable (all lagged one year)	1980s		1990s		2000s	
IMF variables						
Past IMF program	0.757***	(3.82)	0.706***	(5.05)	0.774***	(4.89)
IMF debt/GDP	2.30	(1.37)	2.79	(1.59)	1.73	(1.06)
Global Economic Variables						
Crude oil prices	0.00113	(0.07)	0.0152	(0.60)	-0.0273*	(-2.04)
Agricultural prices	0.0113	(1.32)	0.00721	(1.13)	0.0502	(1.35)
Exports to G5 countries	0.0000250	(1.05)	-.000007.1	(-0.95)	-0.0000311***	(-2.90)
Political Variables						
UN voting proximity	0.457	(1.50)	0.834***	(2.63)	0.657*	(1.96)
US economic aid	5.58***	(2.62)	3.40***	(2.76)	1.33*	(2.08)
Legislative election	-0.0886	(-0.39)	0.370**	(2.31)	0.215	(1.34)
Executive elections	0.663**	(2.50)	0.0206	(0.10)	0.300	(1.62)
Domestic Economic Variables						
Debt service to exports ratio	2.00***	(4.05)	1.56***	(3.20)	1.48***	(3.66)
Current account/GDP < -0.03	0.656***	(3.80)	0.234	(1.86)	0.145	(0.96)
Reserves to months of imports	-0.0804	(-1.91)	-0.0573*	(-2.18)	-0.0113	(-0.45)
Real per capita GDP growth	-0.0154	(-1.13)	-0.00486	(-0.59)	-0.0203	(-1.48)
Real per capita GDP	-0.0000550	(-1.20)	-0.0000341	(-1.36)	-0.0000622*	(-2.16)
Official arrears	-1.31×10^{-10}	(-0.37)	-2.49×10^{-10}***	(-2.6)	-1.28×10^{-10}	(-0.83)
Private arrears	1.14×10^{-9}**	(2.48)	1.41×10^{-10}	(1.82)	6.36×10^{-12}	(0.08)
constant	-3.18***	(-3.17)	-2.87***	(-3.48)	-5.55	(-1.72)
Sample size	389		622		621	
Pseudo R^2	0.2696		0.2010		0.2340	

The z-statistics appear in parentheses. ***, **, * identify coefficient estimates that are significant at the 1, 2.5 and 5 percent one tailed test levels of significance. Errors were estimated using robust estimation for general heteroscedasticity.

TABLE 5: Regional equation summaries for the full sample period.

Region	Sample size and R^2	Political variables with statistically significant coefficient estimates
South Asia	112, 0.360	US economic aid (+)
Europe and Central Asia	153, 0.264	none
Middle East and North Africa	120, 0.371	none
Sub-Saharan Africa	566, 0.204	UN voting (~+) US economic aid (+) Legislative elections (+)
Latin America and Caribbean	430 0.228	US economic aid (+) Executive elections (~+)
East Asia Pacific	242, .350	none

(+) means positive and significant at the 5% one-tailed test level of significance.

(~+) significant at between the 5% and 10% one-tailed test level of significance.

TABLE 6: Political variable summaries for group-period disaggregated estimations

Period Group	Full sample	1980s	1990s	2000s
Full sample	UN voting (+) US aid (+) Leg. elect. (+) Exec. elect (+)	US aid (+) Exec. elect (+)	UN voting (+) US aid (+) Leg. elect. (+)	UN voting (+) US aid (+) Exec. elect (~+)
High middle-income	UN voting (+) US aid (+) Exec. elect (~+)	Leg. elect (+)[a]	UN voting (+)	US aid (~+) Exec. elect (+)
Low-middle income	UN voting (+) US aid (+)	US aid (~+) Exec. elect (+)	UN voting (~+) US aid (+) Exec. elect (~+)	UN voting (~+)
Low income	US aid (+) Exec. elect (~+)	US aid (+)	Leg. elect. (+)	None
Non-concessional programs	UN voting (+) US aid (+) Exec. elect (+)	US aid (+) Exec. elect (+)	UN voting (+) US aid (+) Leg. elect (~+)	UN voting (~+) Exec. elect (~+)
Concessional programs	Leg. elect (+)	UN vote (~+) Exec. elect (+)	Leg. elect. (~+)	None
South Asia	US aid (+)	UN voting (~+)[b] US aid (~+) Exec. elect (+)	UN voting (+)[c] US aid (-) Exec. elect (~-)	UN voting (-)[d]
Europe and Central Asia	None	None	None	Leg. elect (~+)
Middle East and North Africa	None	UN voting (+)[a] US aid (+) Exec. elect (+)	UN voting (~-)[e]	None
Sub-Saharan Africa	UN voting (~+) US aid (~+) Leg. elect (+)	None	Leg. elect. (+)	None[f]
Latin America and Caribbean	US aid (+) Exec. elect (~+)	Exec. elect. (+)	UN voting (+) US aid (~+)	US aid (+)
East Asia Pacific	None	None[a]	US aid (+) Leg. elect. (+)	Leg. elect. (+)[g]

a. Sample extended to 1984- 1994 to allow estimations to converge; b. 1984-1996; c. 1987-1999; d. 1990-2008; e. 1989-1999; f. 1992-2008; g. 1999-2008. In some cases one of the election variables are dropped from the estimations as they are always associated with no agreements.

Appendix 1: Explanatory Variables and their Associated Hypotheses

Global Economic Variables:

Crude prices (+/-). Oil prices can serve as both an indicator of global economic activity or as a variable reflecting the total costs or revenues generated by oil importers and exporters, respectively. As a result, higher oil prices might represent either strong global economic demand or positive balance of payments positions for oil exporting countries (or both) – both of which would be expected to produce a negative coefficient.[20][21]

Agricultural prices (+/-). Similar to the crude price measure, from a global macro perspective high agricultural prices may indicate strong international demand. Producing a negative coefficient. On a country-level basis, however, the expected coefficient will be dependent on whether the benefits for agricultural exporters from higher agricultural prices outweigh the increased costs incurred by agricultural importers.

Commodity prices (+). See explanation for agricultural products above.

Exports to G5 countries (-). As exports to G5 economies decline, the probability of an arrangement should increase. Further, G5 import levels can also be viewed as an indicator of global economic conditions, leading to the same prediction.

Change in world GDP (-). A downward shift represents a slowing in global GDP and is expected to increase the probability of countries requiring official assistance.

Change in world trade (-). A decline in world trade levels may indicate economic malaise in the global economy and improve the likelihood that countries will enter programs.

Endogenous Economic Variables:

Total external debt stocks to real GDP ratio (+). A higher level of external debt stocks could reflect potential default conditions and improve the chances of receiving an IMF loan. On the other hand, higher external debt stocks could also indicate that a country has solid access to international financial markets and would be less likely to visit a Fund facility.[22]

Total external debt service to exports ratio (+). A country's debt service levels, may reflect liquidity concerns as the country's ability to cover upcoming liabilities could be in question. Thus, we would higher debt service levels to lead to a positive coefficient.

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[20] Time lags would be important here since determining how higher oil prices influence economic growth is dependent on the time it takes for the higher prices to create a constraining effect on economy.

[21] An alternative explanation could be that higher oil prices for oil importers would generate poor balance of payments conditions – leading to a positive coefficient.

[22] Difficulties in interpretation also arise when independent variables with various potential explanations generate an insignificant result. More specifically, if a variable's coefficient is insignificant, it becomes challenging to determine whether the variable was actually insignificant or whether the positive and negative effects have cancelled each other out.

Current account balance to real GDP (-). A higher current account deficit – in theory – should be one the most relevant economic variable to a country's financing needs.

Total international reserves to months of imports (-). As a government's ability to cover imports with reserves deteriorates, the probability of signing an agreement increases.

Real GDP per capita growth rate (-). Lower economic growth in a country may reflect numerous domestic economic challenges and generate an increased need for a program.

Real GDP per capita (chain) (-). This variable is partially handled by the income disaggregation portion of this study, but in the general specification we would expect that lower-income countries have a greater propensity to sign an IMF arrangement.

Interest arrears to private creditors (+). Interestingly, this variable can be interpreted as a reflection of a country's liquidity problems or, in relation to the political influence story, as an indicator of the extent to which private financial interests may lobby powerful IMF members to recover their investments.

Interest arrears to official creditors (+/-). A higher level of official arrears may indicate that a country is a frequent issuer of official financing and thus more likely to require assistance in the future. Or, alternatively, that international organizations may be reluctant to lend new funds as their credit outstanding is at risk – implying a negative coefficient.

Change in Interest payments on total external debt (+). The change in interest payments on external debt variable reflects the increase or decrease in annual interest payments and thus captures a country's contemporary interest exposure.

Paris Club debt rescheduling (lagged) (+/-). This variable reflects a low-income country's propensity to rely on official debt relief. Alternatively, the coefficient estimate could be negatively signed since a country's need to sign a new agreement could diminish if a debt rescheduling has recently taken place.

Paris Club debt rescheduling (lead) (+). Since the Paris Club requires that any country having its debt rescheduled have an existing IMF agreement in place, this lead variable should effectively explain numerous prior Fund arrangements.

Past program participation (+). Previous participation in an IMF program increases the probability that a country will revisit the Fund for arrangement.

Political Economy Variables:

Change in political rights (-). A country's political rights measure is defined by Freedom House on a 1 to 7 scale, with 1 representing the greatest possible political rights. Thus, we predict that an improvement in political rights could have both a supply-side and demand-side effect. More specifically the IMF may be more likely to fund politically free countries, and free countries may be more inclined to accept the economic liberalism found in some program conditions.

Civil Liberties (-). A country's civil liberties measure is also defined by Freedom House on a 1 to 7 scale, with 1 representing the greatest possible civil liberties. Greater civil

liberties could lead to a higher IMF propensity to initiate an arrangement; a supply-side determinant.

UN voting proximity (+). Scholars argue that political proximity to the IMF's most powerful member – the United States – increases the likelihood of receiving a Fund program. This variable measures voting proximity on UN votes that have been defined as 'key' to American foreign policy by the US Department of State.

US economic aid as a percentage global American economic aid flows (+). Similar to the UN voting variable, this indicator attempts to reveal that countries that receive higher amounts of US economic aid will be more likely to receive a Fund program.

Legislative Election (+). This variable indicates the presence of a legislative election in a given year. New governments are expected to enter more agreements because they can use the IMF as a scapegoat to implement difficult reforms.

Appendix 2. Summary Statistics, IMF Program Participation Dataset (complete dataset)

Variable	Obs.	Mean	SD	Minimum	Maximum
[1]CrudePrice [C][M]	4368	27.41	14.190	13.08	71.13
[1]AgPrice [C]	4368	92.86	17.442	60.72	120.28
[1]ComPrice [L]	1596	192.27	51.005	130.26	368.53
ΔinWorldGDP [L]	1653	3.34	1.084	0.86	5.02
ΔinWorldTrade [L]	1653	5.87	3.111	-0.93	12.17
[1]G5IM [C][M]	3992	5050.29	21609.12	0	605392.50
ΔinPolRights [C]	3896	-0.03	0.625	-5.0	5.0
[1]UNVote [C][M]	3701	0.43	0.277	0	1
[1]LegElec [L]	1474	0.16	0.369	0	1
[1]CivilLib [L]	1550	4.85	1.515	1	7
[1]lnUSTotalAid [L]	1467	3.29	1.968	-4.61	8.71
PastProgram [C][M][L]	4045	0.49	0.500	0	1
[1]USEcoAid-A [C]	4199	0.29	0.218	0	7.36
[1]USEcoAid-B [M]	1996	0.01	0.064	0	1.39
[1]ParisDebt [L]	1595	0.13	0.332	0	1
[+1]ParisDebt [L]	1595	0.12	0.329	0	1
[1]DebtStock [C][L]	3138	0.30	0.417	0.0003	8.00
[1]DebtServ [C][M][L]	2968	0.19	0.172	0	3.90
[1]CurrentAcct [C][M]	3476	-0.02	0.052	-0.841	0.38
[1]ResCover [C][M]	3377	3.55	3.208	-0.092	43.69
[1]GDPGrowth [C][M]	3992	1.95	8.556	-64.557	123.24
[1]RealGDPpc [C]	4021	6335.89	9297.24	117.217	123472.00
[1]OffArrears [C][L]	3207	1.29	5.100	0	5.30
[1]PrivArrears [C][M]	3207	1.15	6.880	0	1.59
ΔinIntPayment	1639	47.40	1047.91	-94.942	41959.09
[1]CurAcctToGNI [L]	1118	-0.06	0.089	-0.0884	0.429

Note: A [1] indicates a lagged variable, while the [+1] indicates a lead indicator. In order to identify which specifications used which variable, a [C] [M] and [L] were used to identify the complete, MIC, and LIC datasets respectively.

REFERENCES

Anderson, T. B., T. Harr, and F. Tarp. "On US Politics and IMF Lending." *European Economic Review*. 50 (2006). Pp. 1843-1862.

Barro, R., and J. W. Lee. "IMF Programs: Who is Chosen and What Are the Effects?" *Journal of Monetary Economics*. 52 (2005). Pp. 1245-1269.

Bird, G, "The IMF: A Bird's Eye View of Its Role and Operations," *Journal of Economic Surveys,* 21:4 (2007). Pp 683-745.

Bird, G., and T. Orme. "An Analysis of Drawings on the International Monetary Fund by Developing Countries." *World Development*. 9:6 (1981). Pp. 563-568

Bird, G., and R. Rajan. "Too Much of a Good Thing? The Adequacy of International Reserves in the Aftermath of Crises." *The World Economy*. 26:6 (2002). Pp. 873-891.

Bird, G., and D. Rowlands. "IMF Lending: How Is It Affected by Economic, Political and Institutional Factors." *Policy Reform*. 4 (2001). Pp. 243-270.

Bird, G., and D. Rowlands. "The Pattern of IMF Lending: An Analysis of Prediction Failures." *Policy Reforms*. 5:3 (2002). Pp. 173-186.

Bird, G., and D. Rowlands. "The Demand for IMF Assistance: What Factors Influence the Decision to Turn to the Fund." In *Globalization and the Nation State: The Impact of the IMF and the World Bank.* Eds., Kosack, S., J. R. Vreeland, and G. Ranis. New York, New York: Routledge (2006).

Bird, G. and D. Rowlands. "Should It Be Curtains for Some of the IMF's Lending Windows?" *Review of International Organizations* 2(3) (2007), 281-299.

Bird, G., and D. Rowlands. "A Disaggregated Empirical Analysis of the Determinants of IMF Arrangements: Does One Model Fit All?" *Journal of International Development*. 21 (2009). Pp. 915-931.

Bird, G. and D. Rowlands. "Financier or Facilitator? The Changing Role of the IMF in Low-income Countries". In James Boughton & Domenico Lombardi (Eds.), *Finance, Development, and the IMF* (2009a). Oxford: Oxford University Press.

Bird, G. and D. Rowlands. 'The Episodic and Unpredictable Nature of IMF Lending: An Empirical Analysis.' *The World Economy,* 33 (10) (2010), pp 1280 – 1301.

Bird, Graham & D. Rowlands. "The Analysis of Catalysis: the IMF and Private Capital Flows," *processed* (2011).

Boughton, J. M. *Silent Revolution: The International Monetary Fund, 1979-1989.* Washington, D.C.: International Monetary Fund (2001).

Breen, M. "Domestic Interests, International Bargaining, and IMF Lending." *Working Paper in International Studies.* Centre for International Studies – Dublin City University. No. 7 (2010).

Broz, J. L., and M. B. Hawes. "US Domestic Politics and International Monetary Fund Policy." In *Delegation and Agency in International Organizations.* Eds., D. Hawkins, D. A. Lake, D. Nielson, and M. J. Tierney. Cambridge, Mass: Cambridge University Press (2006).

Cerutti, E. "IMF Drawing Programs: Participation Determinants and Forecasting." *International Monetary Fund Working Paper*. WP/07/152 (2007).

Conway, P. "IMF Lending Programs: Participation and Impact." *Journal of Development Economics*. 45 (1994). Pp. 365-391.

Conway, P. "The Revolving Door: Duration and Recidivism in IMF Programs." *The Review of Economics and Statistics*. 89:2 (2007). Pp. 205-220.

Copelovitch, M. S. "Governing Global Markets: Private Debt and the Politics of International Monetary Fund Lending." PhD Dissertation. Harvard University (2005).

Copelovitch, M. S. "Master or Servant? Common Agency and the Political Economy of IMF Lending." *International Studies Quarterly*. 54 (2010). Pp. 49-77.

Cornelius, P. "The Demand for IMF Credits by Sub-Saharan African Countries." *Economic Letters*. 23 (1987). Pp. 99-102.

Dreher, A. "IMF Conditionality: Theory and Evidence." *Public Choice*. 141 (2009). Pp. 233-267.

Dreher, A., J. E. Sturm, and J. R. Vreeland. "Does Membership on the UN Security Council Influence IMF Decisions?" *KOF Working Paper*. No. 151 (2006).

Dreher, A., J. E. Sturm, and J. R. Vreeland. "Global Horse Trading: IMF Loans for Votes in the United Nations Security Council." *European Economic Review*. 53 (2009). Pp. 742-757.

Dreher, A., J. E. Sturm, and J. R. Vreeland. "Buying Votes and International Organizations." *CEGE Working Paper*. No. 123 (May 2011).

Eichengreen, B., P. Gupta, and A. Mody. "Sudden Stops and IMF-Supported Programs." *NBER Working Paper*. No. 12235 (May 2004).

Elekdag, S. "How Does the Global Economic Environment Influence the Demand for IMF Resources." *IMF Working Paper.* WP/06/239 (2006).

Finch, C.D. (1989) *The IMF: the Record and the Prospect, Essays in International Finance, 175*, Princeton, NJ: Princeton University Press.

Ghosh, A., M. Goretti, B. Joshi, A. Thomas, and Juan Zalduendo. "Modeling Aggregate Use of Fund Resources – Analytical Approaches and Medium-Term Projections." *IMF Working Paper*. WP/07/70 (2007).

Gould, E. R. "Money Talks: Supplementary Financiers and International Monetary Fund Conditionality." *International Organization*. 57 (Summer 2003). Pp. 551-586.

Gunduz, Y. B. "Estimating Demand for IMF Financing by Low-Income Countries in Response to Shocks." *IMF Working Paper.* WP/09/263 (2009).

Harrigan, J., C Wang, and H. El-Said. "The Economic and Political Determinants of IMF and World Bank Lending in the Middle East and North Africa." *World Development*. 34:2 (2006). Pp. 247-270.

Joyce, J. P. "The Economic Characteristics of IMF Program Countries." *Economic Letters*. 38 (1992). Pp. 237-242.

Knight, M., and J. A. Santaella. "Economic Determinants of IMF Financial Arrangements." *Journal of Development Economics.* 54 (1997). Pp. 405-436.

Lane, P. R., and G. M. Milesi-Ferretti. "Capital Flows to Central and Eastern Europe." *Emerging Markets Review* 8 (2007). Pp. 106-123.

Meltzer, A. H. *International Financial Institution Advisory Commission.* Washington, D.C.: United States House of Representatives (2000).

Moser, Christoph and Jan-Egbert Sturm. "Explaining IMF lending decisions after the Cold War." *The Review of International Organizations* 6 (3/4) (2011). Pp. 307-340.

Mylonas, Dimitrios. *Systematic or Selective? American Political Influence on IMF Program Participation*. M.A. Research Essay, The Norman Paterson School of International Affairs, Carleton University (2011).

Oatley, T., and J. Yackee. "Political Determinants of IMF Balance of Payments Lending: The Curse of Carabosse." *IMF Working Paper* (2000).

Oatley, T., and J. Yackee. "American Interests and IMF Lending." *International Politics*. 41 (2004). Pp. 415-429.

Pop-Eleches, G. "Crisis in the Eye of the Beholder: Economic Crisis and Partisan Politics in Latin American and Eastern European Monetary Fund Programs." *Comparative Political Studies* 41 (September 2008). Pp. 1179-1211.

Pop-Eleches, G. "Public Goods and Political Pandering: Evidence from IMF Programs in Latin American and Eastern Europe." *International Studies Quarterly*. 53 (2009). Pp. 787-816.

Prezworski, A., and J. R. Vreeland. "The Effect of IMF Programs on Economic Growth." *Journal of Development Economics.* 62 (2000). Pp. 385-421.

Prezworski, A., and J. R. Vreeland. "A Statistical Model of Bilateral Cooperation." *Political Analysis*. 10:2 (2002). Pp. 101-112.

Reynaud, J., and J. Vauday. "Geopolitics and International Organizations: An Empirical Study on IMF Facilities." *Journal of Development Economics*. 89 (2009). Pp. 139-162.

Rowlands, D. "International Monetary Fund Conditional Credit Allocations." PhD Dissertation. University of Toronto (1995).

Santaella, J. "Stylized Facts before IMF-Supported Macroeconomic Adjustment." *Staff Papers – International Monetary Fund*. 43:3 (September 1996). Pp. 502-544.

Steinwand, M. C., and R. W. Stone. "The International Monetary Fund: A Review of the Recent Literature." *Review of International Organizations*. 3:123 (2008). Pp. 123-149.

Stiles, K. W. *Negotiating Debt: The IMF's Lending Process*. Boulder, Colorado: Westview Press (1991).

Stone, R. W. "The Scope of IMF Conditionality." *International Organization*. 62 (Fall 2008). Pp. 589-620.

Sturm, J., H. Berger, and J. Haan. "Which Variables Explain Decisions on IMF Credit? An Extreme Bound Analysis." *Economics & Politics*. 17 (July 2005). Pp. 177-213.

Swedberg, R. "The Doctrine of Economic Neutrality of the IMF and the World Bank." *Journal of Peace Research*. 23:4 (1986). Pp. 377-390.

Thacker, S. C. "The High Politics of IMF Lending." *World Politics*. 52:1 (October 1999). Pp. 38-75.

United States Department of the Treasury. *Report on IMF Reforms: Report to Congress in Accordance with Sections 610(a) and 613(a) of the Foreign Operations, Export Financing and Related Programs Appropriations Act, 1999*. (October 20, 1999).

United States Department of the Treasury. *Quarterly Report to Congress on International Monetary Fund Lending*. (2008).

Voeten, E. "Clashes in the Assembly." *International Organization*. 54:2 (Spring 2000). Pp. 185-215.

Vreeland, J. R. "The IMF: Lender of Last Resort or Scapegoat?" Prepared for the Midwest Political Science Association Annual Meeting, Chicago, April 15-17. (1999)

Vreeland, J. R. "Why do Governments and the IMF Enter into Agreements? Statistically Selected Cases." *International Political Science Review*. 24:3 (2003). Pp. 321-343.

Vreeland, J. R. "Institutional Determinants of IMF Agreements." *Global Fellows Working Papers*. UCLA International Institute (2004).

Vreeland, J. R. *The International Monetary Fund: Politics of Conditional Lending*. New York, New York: Routledge (2007).

Woods, N. "The United States and the International Financial Institutions." In R. Foot, N. MacFarlane, and M. Mastanduno. Eds., *US Hegemony and International Organizations*. Oxford: Oxford University Press (2003).

Windmeijer, F. A. G. "Goodness-of-Fit Measures in Binary Choice Models." *Econometric Review*. 14:1 (1995). Pp. 101-116.