

# THE RESPONSE SPEED OF THE INTERNATIONAL MONETARY FUND

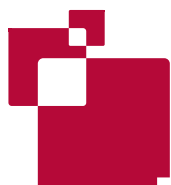
ASHOKA MODY AND DIEGO SARAVIA

## Highlights

- The more severe a financial crisis, the greater has been the likelihood of its management under an IMF-supported programme and the shorter the time from crisis onset to programme initiation. Political links to the United States have increased programme likelihood but have prompted faster response mainly for 'major' crises. Over time, the IMF's response has not been robustly faster, but the time sensitivity to the more severe crises and those related to fixed exchange rate regimes did increase from the mid-1980s. Similarly, democracies had tended to stall programme initiation but have become more supportive of financial markets' demands for quicker action.

Key words: IMF, Financial Crises, Democracy  
JEL Codes: F33, G15, F55

Ashoka Mody is a Visiting Fellow at Bruegel and Visiting Professor in International Economic Policy at the Woodrow Wilson School, Princeton University; Diego Saravia is at the Central Bank of Chile. We are grateful to Carlos Alvarado, Quianru Song and Dante Poblete for superb research assistance and to Graham Bird, Jim Boughton, Russell Kincaid, Franziska Ohnsorge, Hui Tong, Dennis Quinn and Felipe Zurita for helpful feedback on earlier drafts. Two anonymous referees and the editor provided valuable guidance and suggestions. Saravia also acknowledges financial support from DIPUC No. 282150781. An earlier version of this paper was: 'From crisis to IMF-supported programme: does democracy impede the speed required by financial markets?' *IMF Working Paper* WP/08/276, December 2008.



## I. INTRODUCTION

Much scholarly attention has focused on the factors that have led to the International Monetary Fund's financial safety net for countries facing balance of payments stress. The questions posed have been: *why* does the IMF (or the Fund) lend and *why* do countries borrow?<sup>1</sup> Policymakers have also been concerned with the *amount* of lending, especially for countries facing 'exceptional' balance of payments difficulties<sup>2</sup>. In contrast, surprisingly little attention has been directed to analysing the *speed* at which the Fund has responded to crises. While a few case studies have documented the pressure to react quickly (Boughton 1997 and Bordo and James 2000), there has been no systematic attempt to examine the speed of the IMF's response to financial crises.

And, yet, with financial markets moving ever faster, the metric of speed is a valuable one, not only to assess how the Fund has faced the challenge but also as a lens on broader questions of international political economy. The decision to manage a crisis under an IMF-supported programme **is one jointly undertaken by the crisis country and the IMF's management and Board of Executive Directors**. Hence, response speed depends on the severity of the crisis, the economic features and domestic politics of the crisis country, and the political and economic relations of the crisis country with influential Board members. These decisions, moreover, highlight the tensions between the democratic process and the interests of financial markets.

Boughton (1997) regards the Latin American debt crisis of the early 1980s as pivotal in highlighting the need for speed to prevent crises from growing and spreading. Bordo and James (2000) observe that the importance of speed was reinforced in the 1990s as larger capital flows

---

<sup>1</sup> Bird (1996) reviews the early research; other contributions include Thacker (1999), Vreeland (2002), and Barro and Lee (2005).

<sup>2</sup> The Supplemental Reserve Facility was created to meet "large short-term financing" needs. See IMF [1997].

into emerging economies were also associated with the risk of rapid capital outflows and financial crises. These considerations led to discussions for prequalifying IMF members for ready access to Fund resources in the event of a sudden stop in capital flows (IMF 2006). The Flexible Credit Line was introduced in March 2009 when the importance of rapid response was once again emphasised by the fast-moving Great Recession.<sup>3</sup>

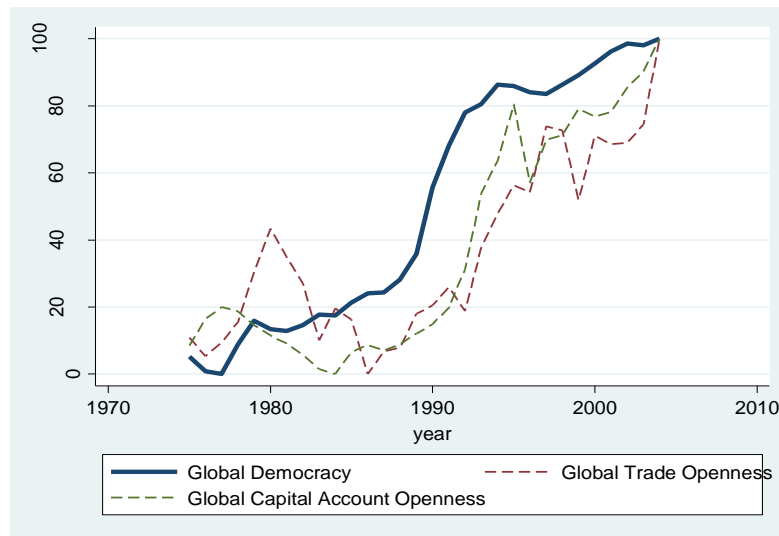
In this paper, we seek to answer several questions. Have more severe crises prompted a faster **response? Has the country's exchange rate regime mattered? What role has the Fund's** governance structure played: in particular, have major shareholders been relevant to the speed of response?

An even more intriguing question is **whether democracies have adapted to the financial markets'** insistence on rapid decisions. The mid-1970s, about when our study commences, is also the start of the so-called 'third wave' of global democratisation, following a brief reversal in the previous decade (Huntington 1991). Quinn (2000) has noted the striking comovement of democracy and financial liberalisation. Figure 1 plots the changes over time in the average measures (across countries) of democracy, trade openness, and capital account openness (all variables normalised to lie between 0 and 100). The pace of democratisation picked up in the late 1970s, and by the mid-1980s, democracy and economic openness were expanding their global reach rapidly. Hence, if economic openness creates risks of crises, the accompanying political openness must adapt to that evolution. In studying the IMF's response speed, we also learn if such an adaptation occurred.

---

<sup>3</sup> <http://www.imf.org/external/np/exr/facts/conditio.htm>.

Figure 1: Global Economic Openness and Democracy



Notes: For each variable, the global average (across countries) in a particular year is represented on scale from 0 to 100. The measure of democracy is based on the Polity IV scale from -10 to +10. Trade openness is the ratio of trade-to-GDP. Capital account openness is based on the Chinn-Ito Index. Further details of each variable are in the data appendix.

We focus on **the IMF's stand-by arrangement (SBA)**, the principal instrument for responding to the short-term balance of payments difficulties that arise during a crisis. An SBA allows a country to draw up to a pre-specified amount, typically over a period of 12-18 months. In contrast, other financing mechanisms are intended to deal with longer-term problems<sup>4</sup>. We study the factors that have influenced the time gap between the onset of a crisis and the initiation of an SBA, which makes available Fund resources—and, often, other complementary financing—to ease the **pressure on the country's payment obligations**. We identify a crisis using the exchange rate pressure index proposed by Kaminsky and Reinhart (1999). A country is considered to be in a crisis when this index is sufficiently above the mean for that country. We use a low threshold on the deviation from the country mean in order to generate a sufficient number of crises

<sup>4</sup> Programmes such as the Extended Fund Facility (EFF) and the Poverty Reduction and Growth Facility have longer maturities than the SBA and, as such, have a more developmental focus. While select SBA's have had longer maturities, the distinction between an EFF and an SBA had sharpened over the period covered by our study (recently circumstances have forced the use of EFFs for crisis lending in recognition of the protracted problems of the Eurozone periphery). An SBA may be combined with the Supplemental Reserve Facility to allow larger levels of borrowing.

observations for the main analysis. Results with a higher threshold generate fewer observations but confirm our principal results<sup>5</sup>.

Between 1977 and 2004, of the about 300 SBAs concluded, about 200 were associated with crises that occurred in the previous two years. Thus, while two-thirds of the SBAs were linked to crises, others presumably reflected noncrisis situations, including rolling over existing SBAs where a country continued to remain vulnerable. For the programmes associated with a crisis, the median spell from crisis to programme was 17 months (Table 1, Panel A), the relatively long period reflecting the low threshold in the definition of a crisis. Notice also that about a third of the programmes that did follow a crisis did not have to be rushed because an SBA was in place when the crisis occurred.<sup>6</sup> More severe crises did demand quicker intervention, but even our more stringently-defined crisis is associated with a median spell of 12 months (Panel B of Table 1). The data also point to a modest decline in the spell, or response time, which fell from a median of 19 months during 1977-1986 to 15 months in the years after 1986. The decline is somewhat more pronounced with the more stringent crisis definition.

We use Poisson regressions to examine the determinants of the spell from a crisis to a programme (following Hausman *et al*, 2004 and Winkelmann and Boes, 2006). Of independent interest is an analysis of the conditions that led crises to eventually culminate in a programme, which helps us judge if IMF programmes have focused on an ‘unusual’ set of crises. If that were the case, our analysis of response speed would be biased by those ‘unusual’ crises. Thus, Poisson regressions

---

<sup>5</sup> Thus, this paper deals with the speed of Fund intervention but does not pursue a more complex inquiry, namely, whether faster intervention helped sustain or accelerate long-term growth. That analysis requires appropriate accounting for mean reversion while also controlling for long-term growth determinants. Because of the tendency for mean reversion, there was more scope for post-programme gain where there was greater distress. Countries that received faster intervention achieved greater immediate gains but typically grew at a slower absolute rate in the three years following programme initiation, presumably because of more endemic problems.

<sup>6</sup> Thus, the presence of an IMF-supported programme has not guaranteed that a crisis would not occur!

combined with conditional logits allow for a qualitative assessment of selection bias; we also report results of censored Poisson regressions, which, in principle, directly account for the selection bias.

The results suggest that the factors leading to an eventual IMF financial commitment are also the ones that typically accelerated the speed of programme negotiation. In particular, the more severe was the crisis, the higher was the likelihood of an arrangement with the Fund; and a more severe crisis was also associated with a shorter time from a crisis to a programme. Thus, there is no systematic evidence that serious crises may have not culminated in a programme because policy choices proved too challenging. Nevertheless, to safeguard against other sources of selection bias, we emphasise the censored Poisson results in the few instances they disagree with the Poisson results.

Did the IMF's **speed of** response increase over time? The evidence, with borderline statistical significance, is that response speeds did increase after the Latin American crises of the 1980s. More clearly, after 1986, there was greater time-sensitivity to the severity of a crisis and to crises in countries with fixed exchange rate regimes (since, presumably, these were subject to a disorderly crisis aftermath). More interestingly, the relationship with democracies changed over time. Democracies had tended to slowdown decisions until the mid-1980s—when the new democratic wave was still in its early stages. However, that drag disappeared thereafter as trade and financial openness began a decisive and sustained upward trend. We find that in the post-1986 years, democratic regimes were apt to respond faster than non-democratic regimes. Sattler and Walter (2009) similarly report that democratic governments were more likely to find the 'space' to defend against currency crises. These findings also **support Quinn's (2000)** conclusion that financial and commercial interests in a democracy are influential in guiding domestic policy.

The next section (Section II) describes the construction of the crisis dates and response time. This is followed (in Section III) by our principal results, examining the relationship between response speed and the degree of external vulnerability. In Section IV, the special features of ‘major’ crises help reinforce the key role of country vulnerability while also clarifying the influence of the crisis **country’s relationship with the United States. Section V finds that greater deference** was accorded to crisis severity and fixed exchange rate regimes after the mid-1980s while also suggesting that the democratic process accommodated the need for speed. A last section concludes.

## II. THE CRISIS AND RESPONSE SPEED: MEASUREMENT ISSUES

We begin by identifying the month in which a crisis occurred. From then to the conclusion of the negotiation of the IMF-supported programme is the span or the ‘spell,’ which is the dependent variable of interest. In defining a crisis, we were guided by the Kaminsky and Reinhart (1999) gauge of the **pressures faced by a country’s currency**.<sup>7</sup> The principle behind the measure is that pressure on the currency leads either directly to its depreciation or, where a country chooses to defend the currency, to a loss of reserves. Thus, the larger the depreciation and the greater the loss of reserves, the higher is the pressure. Kaminsky and Reinhart propose a composite indicator based on monthly changes in the exchange rate and reserves.

$$I = \frac{\Delta e}{e} - \frac{\sigma_e}{\sigma_R} \cdot \frac{\Delta R}{R}$$

---

<sup>7</sup> The focus on currency crises is determined by the practical difficulty of dating, for example, banking and debt crises. A dummy variable for banking crises did not produce statistically-significant results.

' $e$ ' is the end-of-the-month exchange rate, ' $R$ ' is the end-of-the-month **reserves**' level, and the  $\Delta$  operator refers to monthly change.<sup>8</sup> To match the units for reserves to that of the exchange rate, the rate of change of reserves is normalised by the ratio of the standard deviation of exchange rate ( $\sigma_e$ ) to the standard deviation of rate of change of reserves ( $\sigma_r$ ). Kaminsky and Reinhart (1999) show in their Figure 4 that a crisis evolves over time to reveal its severity. Thus, a slow drain of reserves is followed by a sharp depreciation of the exchange rate. The 'crisis month' is typically the first in which a (generally overvalued) exchange rate makes a sizeable move following the loss of reserves. In Kaminsky and Reinhart, a country is defined as entering a crisis in the month when their indicator is three standard deviations above the mean for that country. Our indicator is softer: it turns on when the index is one standard deviation above its mean. This allows us to identify a larger number of events as 'crises,' providing us with more data points to analyse the duration from a crisis to a Fund programme. We compensate for this leniency by allowing, in the regressions, for continuous variation in the severity of the crisis, as measured by the first principal component of the extent of the depreciation and foreign exchange **reserves**' loss, along with a dummy variable for the incidence of a sudden stop<sup>9</sup>.

We use the IMF's 'Date of Arrangement' for each stand-by arrangement as the date on which the programme came into effect. The span between the month of arrangement and the month of the first crisis in the two-year window gives us our dependent variable, the spell. Underlying this definition are two assumptions. First, since we have no direct way to link a crisis to a particular IMF-supported programme, we assume that if one was negotiated within two years of the crisis, it was

---

<sup>8</sup> Some also include the change in interest rate in this pressure index. However, the lack of comparable interest rate data across a broad range of countries typically limits this addition.

<sup>9</sup> We also present results using a tighter crisis definition: a 1.5 standard deviation threshold: the number of observations drops considerably but the results remain qualitatively similar.



related to that particular crisis<sup>10</sup>. Clearly, the two-year time window within which we scanned was set arbitrarily. As with the definition of the crisis, it was a compromise to generate a sufficient number of observations for analysis. Second, the convention of using the earliest crisis in a two-year window assumes that the first crisis is the originating event in possibly a series of crises. However, to retain the information on the incidence of subsequent crises, the regression analysis includes dummy variables to reflect if a subsequent crisis occurred in the first three months and the first six months following the original crisis.

In this way, it was possible to relate around 200 SBA programmes to our crisis indicator during the time span January 1977 to December 2004. In practice, because the right-hand-side explanatory variables were sometimes missing, we work with a sample of 183 observations of crisis followed by programmes. In addition, a ‘censored’ observation is one where a crisis was not followed by a programme in the following 24 months. Here, since we do not have the anchor of programme timing, we pick the first crisis in non-overlapping 24-month windows. That gives us 224 censored observations that are usable as zeroes in the conditional logit estimations used to distinguish the characteristics of crises that led to a programme<sup>11</sup>. These 224 censored observations also allow us report results of a censored Poisson regression.

In Table 2, we report the means and standard deviations of the variables used in our analysis. Crises that were followed by programmes were, on average, more severe and more likely to have a fixed exchange rate regime than crises that were not followed by programmes. The average democracy score, however, was about the same for crises that were and were not followed by programmes. .

---

<sup>10</sup> If there were multiple crises within the two-year period prior to the particular programme, the first crisis was used to define the spell.

<sup>11</sup> In the conditional logit regressions, some observations are dropped because, for some countries, all observations are censored or non-censored.

Before concluding this section, one issue is worth highlighting. Successful negotiation of a programme is a joint decision of a country authorities and the IMF, and reflects their different perspectives and interests. Studies have tried through bivariate probits to disentangle these interests in arriving at a programme decision. We have not pursued that important distinction since a similar estimation with count data models would present complex challenges. Substantively, we are of the view that our explanatory variables cannot always be attributed to the interests of a particular party and that many variables discussed in this paper typically reflect joint, mutually reinforcing incentives. This is clearly so for crisis severity, which leads both parties to seek a programme with urgency, one predominantly in the national interest and the other also to maintain international financial stability. The political variables—democracy and affinity with the United States—possibly reflect country priorities and leverage.

### III. ECONOMIC VULNERABILITY: PROGRAMME DECISION AND SPEED OF RESPONSE

There are two decisions: to initiate an IMF-supported programme and the speed at which this is done. The conditional logit estimation is used to analyse the programme decision, ie to identify the factors that led to the programme. The conditional logit we estimate, while superficially similar to that estimated in many prior studies, is restricted to episodes where a crisis, albeit even a mild one, occurred. In contrast, conventional analysis includes in the no-programme observations all possible country-year combinations without a programme. Next, conditional on a programme, the Poisson regression is used to assess the determinants of the response speed. The dependent variable in the Poisson regression is the number of months from crisis to programme, and takes on

integer values above zero<sup>12</sup>. A concern arises with regard to the possibility of selection bias in our response speed regressions. Focusing only on crises that were followed by an IMF-supported programme can be potentially misleading if the crises that did not culminate in a programme had systematically differential behaviour. To deal with this potential problem, we also present results with the censored analysis of our Poisson estimations. The observations where there was a crisis but no programme were treated as censored.

We discuss results from the conditional logit and non-censored Poisson regressions and also the censored Poisson regressions to highlight the most robust findings. Throughout we include country dummies<sup>13</sup>. Use of country dummies allows control for unchanging country-specific features that may condition the negotiation with the IMF.

Our full sample results are presented in Table 3. We find that the factors that led from a crisis to a programme also increased the speed of the programme, or else the particular determinant was an insignificant influence in either the programme or the speed decision. If a prior programme was already in place, the reduced likelihood of a new programme (the conditional logit coefficient has a negative sign) was associated with a longer response time (the Poisson has a positive sign, indicating a more drawn out spell from crisis to programme). All else equal, the existing programme appears to provide an umbrella for Fund assistance and hence reduces the likelihood and urgency of a new programme<sup>14</sup>.

---

<sup>12</sup> Poisson estimation can be interpreted as a duration model with a constant hazard rate. For count data, the Poisson model **is the benchmark, with the alternatives generally built as extensions to deal with the restriction implicit in the Poisson's** variance structure. Negative binomial models produced virtually indistinguishable results.

<sup>13</sup> We use conditional logit because it is likely to handle better the possible bias in probit estimations with fixed effects. The results from probits and conditional logits, however, were similar. The signs and significance of the coefficients in conditional logit (and probit) estimations are consistent with the existing literature and provide a meaningful and useful contrast with the speed of response coefficients to tell a unifying story. For the use of fixed effects in count data models, see Allison *et al* (2002).

<sup>14</sup> The Fund can modify the existing programme to accommodate the new post-crisis situation.

A similar conclusion applies to the response to crisis severity. We report on two different approaches to assessing the severity of a crisis. First, greater exchange rate depreciation and the incidence of a sudden stop make a programme more likely while also increasing the speed of response. Second, we combine vulnerability indicators (exchange rate depreciation, reserve loss, and incidence of sudden stop) and use their first principal component to represent overall crisis severity<sup>15</sup>. Once again, greater crisis severity is associated with higher programme likelihood and faster speed to programme. Thus, although a more serious crisis requires time to design an appropriate and more complex policy response, the preservation of domestic and international financial stability require acting expeditiously. The implication of our finding is that financial stability considerations focus efforts to overcome the programme design challenges.

Past studies have concluded that a tight US monetary policy, reflected in a higher US Federal Funds rate, is associated with restricted emerging market access to international capital (Calvo, Leiderman, and Reinhart, 1996). However, we find that a lower Federal Funds rate raises the likelihood of a programme (although not significantly so) and also raises the speed of response. It could be that lower rates are associated with weaker US and global economic prospects and it is these prospects that are central to the economic outlook for emerging economies, driving the programme decision and its speed.

The exchange rate regime does not significantly influence the probability of a programme (the dummy variable for a fixed-rate regime in the conditional logit has a statistically insignificant coefficient). But conditional on there being a programme, a fixed-rate regime leads to a faster programme decision presumably for financial stability considerations.

---

<sup>15</sup> We considered a crisis more severe the greater was the exchange rate depreciation (in the six months after the date of the crisis) and the larger was the loss of reserves (in the six months before the date of the crisis). We also considered somewhat different time spans, but with qualitatively similar results.

Finally, consider the ‘political’ determinants of programme decision and speed. A feature of IMF governance, emphasised by Barro and Lee (2005), is the share of a country’s quota in the aggregate ‘subscriptions’ (funding) from all member countries<sup>16</sup>. A country’s quota share is a measure of its economic importance in the global economy and can also be thought of a measure of the country’s political influence on the Fund’s Executive Board. Like Barro and Lee (2005), we find that a larger quota share raises the likelihood of a Fund programme<sup>17</sup>. Countries with larger quota shares may have somewhat greater clout but they may also be more reluctant to borrow from the Fund for reputational reasons. It is, therefore, possible that the quota share is measuring other attributes such as stronger institutional capacity to implement a programme. Consistent with ambivalence, we find that a larger quota share, although associated with greater propensity to conclude a programme, is not a significant correlate of programme speed.

Many studies have concluded that political and economic affinity with the United States, in particular, **strengthens a country’s ability** to obtain IMF support. Thacker (1999) showed that a recent increase in voting affinity with the United States in the UN General Assembly (independent of the initial affinity) helped secure IMF loans. Barro and Lee (2005) found that the level of UN voting concordance and larger trade shares with the United States were associated with higher probabilities of obtaining IMF lending as well as with larger loan amounts<sup>18</sup>. This outcome, Broz and Hawes (2006) suggest, reflects private financial interests. They found that financial lobbies

---

<sup>16</sup> *“Quota subscriptions generate most of the IMF’s financial resources. Each member country of the IMF is assigned a quota, based broadly on its relative size in the world economy. A member’s quota determines its maximum financial commitment to the IMF, its voting power, and has a bearing on its access to IMF financing.”*  
<http://www.imf.org/external/np/exr/facts/quotas.htm>.

<sup>17</sup> Other research, however, is less supportive of this conclusion (see, for example, Eichengreen, Gupta, and Mody 2008).

<sup>18</sup> Unlike in other studies, Barro and Lee (2005) also found similar effects vis-à-vis European shareholders. Dreher, Sturm, and Vreeland (2009) find that temporary membership of the UN Security Council provides easier access to IMF loans and with somewhat lower conditionality: they infer that the permanent members trade favours for cooperation on the Security Council. Earlier, Dreher and Jensen (2007) found that friends of the G7 nations in the UN were subject to less onerous conditionality by the IMF. See also Steinwand and Stone (2007) for a recent review.

influence US Congressional votes in favour of IMF quota increases; also, the likelihood of lending and the amount of IMF lending was higher the greater was the exposure of US money centre banks in the borrowing countries (see also Oatley and Yackee, 2004). Despite this widespread view, in our full sample, we only find evidence for a US influence on the probability of concluding a programme but not on the response speed<sup>19</sup>.

We also experimented with a number of domestic institutional and political variables. Here we report on the influence of democracy, with democracy measured in terms of whether the Executive and Legislature are filled through contested elections as in Cheibub *et al* (2009) and represented by a binary variable. For the whole sample, there is no evidence that such domestic variables influence either the programme decision or the response speed. An alternate Polity IV measure of democracy showed similar results.

Finally, the greater the lending **amount committed as a ratio of the country's quota, the greater is** the speed at which the programme is negotiated; presumably where financial stability concerns are serious, both speed and a larger financial safety net are needed<sup>20</sup>.

---

<sup>19</sup> We have also tried US Aid and Key Votes in the UN as proxies of political proximity with the US without finding additional insights.

<sup>20</sup> The amount does not exist when there is no programme and hence is not included in the Conditional Logit and Censored Poisson regressions.

#### IV. MAJOR CRISES

Is there a crisis threshold above which programme determinants and speed change in a qualitative manner? As noted above, we use a relatively weak definition of crisis (with the exchange rate pressure index one standard deviation above its mean) to increase the sample of crises for our statistical analysis. But, as we have seen, crisis severity matters. In this section, we ask if within this broader pool of crises, more severe crises stand out in some respects. We define 'major' crises as those with the exchange rate pressure index 1.5 standard deviations above the country mean. In Table 4, we include a dummy variable for a major crisis thus defined<sup>21</sup>. Major crises increase the probability that a programme is concluded but do not exert a significant effect on the speed of response.

In Table 5 we divide the sample in major and non-major crises to assess if the responses to programme influences differ. The pattern of the results is very similar to the overall results, providing some confidence that the findings are not being driven by outliers. Greater crisis severity increases the probability of programmes for major crises but increases the speed for both non-major and major crises. A new crisis in the second quarter slows down programme negotiations for the non-major programmes. In contrast, while a new crisis in the second quarter increases the probability of concluding a programme when a major crisis erupts, it has no impact on the speed. The main new interesting finding is that UN voting affinity with the United States does speed up programme negotiations but only for major crises. It is as if the political capital is expended only

---

<sup>21</sup> We also considered crises where the exchange rate pressure index was two standard deviations above the country mean. While the results were qualitatively similar, their precision was smaller given the small size of such crises.

for important considerations. For non-major programmes, in fact, affinity with the US is associated with a slowdown (though only at the 10 percent significance level)<sup>22</sup>.

## V. CHANGES OVER TIME

A final question we put to the data is whether the speed of IMF response has increased over time. For this we consider two periods: before and after the Latin American debt crisis of the 1980s, thus covering 1977-86 and 1987-2004. Such a division is endorsed by Boughton (1997, p. 3) who concludes that prior to the Latin American crisis, the Fund viewed its role as essentially the same in crisis and non-crisis lending activities. The protracted crisis in Latin America highlighted the need for a systemic perspective and hence raised the priority accorded to speed in responding to crises. In particular, **one country's** debt-servicing challenge placed other countries at risk since **lenders' balance sheets were weakened and/or lenders perceived risks** as correlated across countries. The Fund increasingly viewed itself as a 'crisis manager,' and speed became an important element of the policy response.

Following the approach for the analysis of major crises, we introduce a dummy for the time period 1987-2004 in Table 6<sup>23</sup>. The results indicate that, controlling for all the other determinants, the propensity to agree on an IMF-supported programme did not change from the first to the second period, but the evidence suggests that the programmes that were agreed on were negotiated at a faster speed (this conclusion being valid only at the 10 percent significance level).

---

<sup>22</sup> Kilby (2011) finds that World Bank projects are prepared faster if countries vote in the UN with the United States on votes it considers important and also when countries are temporary members of the UN Security Council or are members of the **World Bank's Board of Executive Directors**. This appears to be a stronger result than ours; but since Kilby has not differentiated projects by size or importance, it is hard to make a direct comparison.

<sup>23</sup> We experimented with breaking the sample also in 1986 and 1988, reaching similar results.



The further analysis of the two time-subsamples in Table 7 gives us greater insight into the conditional shifts in response speed. First, the more severe the crisis, the higher was the likelihood of a programme in the second period and the greater the speed of response. Together, the results of the first and second period suggest that crisis severity was more of an alarm signal after the Latin American crisis. Second, the risks associated with a fixed exchange rate regime became more of a concern to the international community. Both these factors—a more severe crisis and greater attention to the risks associated with speculative runs against fixed rate regimes—point to the heightened potency of international capital markets in precipitating systemic crises and hence the need to react quickly in these situations. Note also that the amount of the loan was associated with quicker negotiations only in the second period, indicating the propensity to move quickly with larger programmes after 1986.

A higher Fed Funds rate was associated with a lower probability of concluding a programme and with slower response in both periods (though with conventional statistical significance only in the Poisson regression). The evidence is suggestive, as stated earlier, that the financial stress due to higher rates is mitigated by accompanying strength of global growth prospects. The other variable representing global prospects—petroleum price—seems to be influential only in the first period in raising the probability of a programme.

The regressions show a retarding effect of democracy on programme speed in the first period, consistent with the idea that many democracies had not yet matured and hence had difficulty in dealing speedily with crises. This finding goes through with an alternate (Polity IV) measure of democracy<sup>24</sup>. In contrast, democracy is associated with a faster response speed in the second

---

<sup>24</sup> While we have chosen to focus on democratic institutions as conditioning country incentives and capability for responding to crises, a variety of other political factors could, in principle, be influential. We leave that exploration for further research.

period. This suggests that as capital markets came to place greater value on speed, democracies adapted to speed up decisions (this is consistent with Sattler and Walter, 2009)<sup>25</sup>.

There is some evidence that political relationships became more relevant in the second period. Higher probability of programme conclusion and greater speed are associated with the size of the IMF quota share, suggesting that the larger IMF members were accorded more deference. The affinity with the United States raises the speed of negotiations in the second period. But in the case of both these variables, only the non-censored results are statistically significant, casting some doubt on the findings.

## VI. CONCLUSIONS

This paper is a first attempt at estimating the **IMF's** speed of response to a crisis and examining the determinants of that speed. We also present results for the factors that determined whether an IMF-supported programme was established or not following a crisis. We find that the key factors that make a programme more likely also increase the speed of response. In particular, greater economic and financial stress has increased the likelihood of a programme and has also spurred faster programme decisions.

Previous case studies and statistical analyses had shown that political affinity with the US increased the probability of an IMF-supported programme. Consistent with those findings, our results further reveal that greater political affinity with the US is associated with more rapid programme decisions, although this is so only when the crisis intensity has crossed a threshold.

---

<sup>25</sup> Moser and Sturm (2011) find that autocratic regimes are more likely than democracies to conclude an IMF programme. We do not find this to be the case.

The evidence in this paper is, therefore, consistent with a US role guided by the interests of its financial sector in an ever more integrated global market place.

The Latin American debt crisis, instigated by the Mexican default in 1982, created greater awareness of international spillovers and systemic risks. The combination of evidence from different methodologies suggest that this led to faster negotiations of IMF programmes after 1986 especially for the more severe crises or when the crisis country had a fixed exchange rate regime.

The change over time in the reaction speed of democracies is of special interest. With the onset of a new global wave of democratisation in the mid-1970s, the political process appears initially to have hindered rapid response. But from the mid-1980s, democracies no longer slowed the pace of response; indeed, democracies appear to have been supportive of greater speed. A positive interpretation of this finding is that domestic democracy adapted to the needs of the new generation international financial crises. If true, the outcome is good for democracy and for the future of financial globalisation. But the finding is also consistent with well-organised financial and commercial interests that have been better able to press for speed at times of crises.

## References

- Allison, Paul D. and Waterman, Richard P., 2002, "Fixed-Effects Negative Binomial Regression Models," *Sociological Methodology*, 32: 247-265
- Barro, Robert and Jong-Wha Lee, 2005, "IMF Programs: Who Is Chosen and What Are the Effects," *Journal of Monetary Economics* 52(7): 1245-1269
- Bird, Graham, 1996, "Borrowing from the IMF: the Policy Implications of Recent Empirical Research," *World Development* 24: 1753-60
- Bordo, Michael and Harold James, 2000, "The International Monetary Fund: Its Present Role in Historical Perspective," **NBER Working Paper No. W7724**
- Boughton, James M., 1997, From Suez to Tequila: The IMF as Crisis Manager, IMF Working Paper WP/97/90. A shorter version was subsequently published in *The Economic Journal*, 110 (460): 273-291
- Broz, J. Lawrence and Michael Brewster Hawes, 2006, "Congressional Politics of Financing the International Monetary Fund," *International Organization* 60 (Spring): 367–399
- Calvo, G., L. Leiderman, and C. Reinhart, 1996, "Capital Flows to developing Countries in the 1990s: Causes and Effects," *Journal of Economic Perspectives* 10 (Spring): 123-139
- Cheibub, J. A., J. Gandhi, and J.R Vreeland, 2009, "Democracy and Dictatorship Revisited," *Public Choice* 143 (1-2): 67-101
- Dreher Axel and Nathan Jensen, 2007, "Independent Actor or Agent? An Empirical Analysis of the Impact of U.S. Interests on International Monetary Fund Conditions," *Journal of Law and Economics*, 50 (February)
- Dreher, Axel, Jan-E. Sturm and James R. Vreeland, 2009, "Global Horse trading: IMF loans for votes in the United Nations Security Council," *European Economic Review*, 53: 742-757
- Eichengreen, B., P. Gupta, and A. Mody, 2008, "Sudden Stops and IMF-Supported Programs," in Sebastian Edwards and Márcio G. P. Garcia, editors, *Financial Markets Volatility and Performance in Emerging Markets*, Chicago: University of Chicago Press
- Hausman, J.A., B.H. Hall, and Z. Griliches, 1984, "Econometric Models for Count Data with an Application to the Patents-R&D Relationship," *Econometrica* 52: 909-938
- Heckman, J., 1981, "Statistical Models for Discrete Panel Data," in C. Manski and D. McFadden, editors, *Structural Analysis of Discrete Data with Econometric Applications*, Cambridge: MIT Press
- Henisz, W. J. 2002, "The Institutional Environment for Infrastructure Investment," *Industrial and Corporate Change* 11(2): 355-389
- Huntington, Samuel P., 1991, "The Third Wave: Democratization in the Late Twentieth Century," Norman and London: University Of Oklahoma Press

International Monetary Fund, 1997, "IMF Approves Supplemental Reserve Facility," Press Release Number 97/59, <http://www.imf.org/external/np/sec/pr/1997/PR9759.HTM>

International Monetary Fund, 2006, "IMF Executive Board Holds Board Seminar on Consideration of a New Liquidity Instrument for Market Access Countries," Public Information Notice (PIN) No. 06/104, September 13, 2006, <http://www.imf.org/external/np/sec/pn/2006/pn06104.htm>

Kaminsky, Graciela and Carmen Reinhart, 1999, "The twin Crisis: The Causes of Banking and Balance of Payments Problems," *American Economic Review* 89(3): 473-500

Kilby, Christopher, 2011, "The Political Economy of Project Preparation: An Empirical Analysis of World Bank Projects," Villanova School of Business Economics Working Paper #14

Moser, Christoph and Jan-Egbert Sturm, 2011, "Explaining IMF Lending Decisions after the Cold War", *Review of International Organizations* 6: 307-340

Oatley, Thomas and Jason Yackee, 2004, "American Interests and IMF Lending," *International Politics* 41: 415-429

Quinn, Dennis, 2000, "Democracy and International Financial Liberalization," available at <http://faculty.msb.edu/quinnd/>

Sattler, Thomas and Stefanie Walter, 2009, "Globalization and Government Short-Term Room to Maneuver in Economic Policy: An Empirical Analysis of Reactions to Currency Crises." *World Political Science Review* 3(1)

Shambaugh, J., 2004, "The Effect of Fixed Exchange Rates on Monetary Policy", *Quarterly Journal of Economics* 119(1): 301-352

Steinward, Martin and Randall W. Stone, 2007, "The International Monetary Fund: A review of the recent evidence". *Review of International Organizations*, 3(2): 123-149

Thacker, Strom, 1999, "The High Politics of IMF Lending," *World Politics* 52: 38-75

Vreeland, 2002, "Institutional Determinants of IMF Agreements," [www.yale.edu/macmillan/globalization/Institutional\\_Determinants\\_.pdf](http://www.yale.edu/macmillan/globalization/Institutional_Determinants_.pdf)

Winkelmann, R. and S. Boes, 2006, *Analysis of Microdata*, Berlin: Springer-Verlag

Table 1: The Spell—from Crisis to Standby Arrangement (SBA)

| Panel A: Softer Crisis Definition                               |                     |  |                  |
|---|---------------------|--|------------------|
| Duration (median, in months) from Crisis to Standby Arrangement |                     |  |                  |
| [in parentheses, average number of SBAs per year]               |                     |  |                  |
|   | No existing program | With Existing program at<br>time of crisis | <b>All SBAs</b>  |
| 1977-1986   | 17<br>[5]           | 19<br>[3]                                  | <b>19</b><br>[9] |
| 1987-2004   | 12<br>[4]           | 19<br>[2]                                  | <b>15</b><br>[5] |
| <b>All SBAs</b>   | <b>15</b><br>[4]    | <b>19</b><br>[2]                           | <b>17</b><br>[7] |

Notes:

1. A crisis is defined as a one-standard deviation [increase] in the exchange rate pressure index.
2. As discussed in the text, these SBAs refer only to those that were associated with a crisis.

| Panel B: Stringent Crisis Definition                            |                     |  |                  |
|---|---------------------|--|------------------|
| Duration (median, in months) from Crisis to Standby Arrangement |                     |  |                  |
| [in parentheses, average number of SBAs per year]               |                     |  |                  |
|   | No existing program | With Existing program at<br>time of crisis | <b>All SBAs</b>  |
| 1977-1986   | 15<br>[4]           | 15<br>[3]                                  | <b>15</b><br>[7] |
| 1987-2004   | 9<br>[3]            | 14<br>[1]                                  | <b>11</b><br>[4] |
| <b>All SBAs</b>   | <b>11</b><br>[3]    | <b>15</b><br>[2]                           | <b>12</b><br>[5] |

Notes:

1. A crisis is defined as a 1.5-standard deviation [increase] in the exchange rate pressure index.
2. As discussed in the text, these SBAs refer only to those that were associated with a crisis.

Table 2: Explanatory Variables' Mean and Standard Deviation.

| Variables  | IMF program          | No IMF program       |
|--|----------------------|----------------------|
|  | following a crisis   | following a crisis   |
|  | Mean                 | Mean                 |
|  | [Standard Deviation] | [Standard Deviation] |
| New Crisis in First Quarter<br>(dummy indicating a crisis in the first quarter after the original one)       | 0,32<br>[0,47]       | 0,29<br>[0,46]       |
| New Crisis in Second Quarter<br>(dummy indicating a crisis in the second quarter after the original one)     | 0,35<br>[0,48]       | 0,27<br>[0,44]       |
| Existing Program Dummy<br>(dummy indicating if there is a program at the time of the crisis)                 | 0,37<br>[0,48]       | 0,29<br>[0,45]       |
| Exchange rate depreciation<br>(in the 6 months after a crisis)   | 0,20<br>[0,72]       | 0,14<br>[0,78]       |
| Change in reserves<br>(in the 6 months before the crisis)  | -0,24<br>[1,18]      | -0,17<br>[1,19]      |
| Sudden Stop<br>(dummy variable indicating a Sudden Stop)   | 0,07<br>[0,26]       | 0,03<br>[0,16]       |
| Crisis Indicator<br>(principal components: change in reserves, depreciation and sudden stop)                 | 0,11<br>[1,18]       | -0,09<br>[0,91]      |
| Fixed Exchange Rate Regime<br>(dummy variable indicating a fixed exchange rate regime)                       | 0,30<br>[0,46]       | 0,25<br>[0,43]       |
| Federal Funds Rate<br>(in percentage points)   | 8,21<br>[3,92]       | 7,22<br>[3,33]       |
| Petroleum Price<br>(in logs)   | 4,32<br>[0,36]       | 4,27<br>[0,32]       |
| IMF Quota Share<br>(in logs)   | -0,27<br>[1,16]      | -0,16<br>[1,24]      |
| UN Voting Affinity with the United States<br>([-1,1], with higher numbers indicating higher affinity levels) | -0,38<br>[0,36]      | -0,47<br>[0,28]      |
| Democracy<br>(dummy variable indicating democratic regimes)  | 0,53<br>[0,50]       | 0,52<br>[0,50]       |
| Executive Constraints<br>([0,1], with higher numbers indicating greater constraints)                         | 0,30<br>[0,22]       | 0,30<br>[0,21]       |
| Number of observations   | 183                  | 224                  |

**Table 3: Determinants of a Program and the Time to Program**

| LABELS  | (1)<br>Clogit      | (2)<br>Clogit      | (3)<br>Poisson      | (4)<br>Poisson      | (5)<br>CPoisson     |
|---|--------------------|--------------------|---------------------|---------------------|---------------------|
| New Crisis in First Quarter                       | -0.10<br>[-0.34]   | -0.09<br>[-0.32]   | -0.04<br>[-0.78]    | -0.05<br>[-0.96]    | -0.04<br>[-0.88]    |
| New Crisis in Second Quarter                      | 0.56<br>[1.86]*    | 0.56<br>[1.87]*    | 0.09<br>[1.67]*     | 0.08<br>[1.53]      | 0.06<br>[1.23]      |
| Existing program dummy                            | -0.62<br>[-2.12]** | -0.62<br>[-2.11]** | 0.23<br>[4.20]***   | 0.22<br>[4.05]***   | 0.16<br>[3.39]***   |
| Exchange rate depreciation                        | 0.27<br>[1.74]*    |                    | -0.07<br>[-1.79]*   |                     |                     |
| Sudden stop                                       | 1.07<br>[1.75]*    |                    | -0.50<br>[-4.32]*** |                     |                     |
| Crisis Severity                                   |                    | 0.31<br>[2.56]**   |                     | -0.12<br>[-4.85]*** | -0.12<br>[-5.02]*** |
| Fixed Exchange Rate                               | -0.47<br>[-1.03]   | -0.46<br>[-1.03]   | -0.14<br>[-1.61]    | -0.15<br>[-1.69]*   | -0.15<br>[-1.87]*   |
| Federal funds rate                                | -0.08<br>[-1.38]   | -0.08<br>[-1.43]   | 0.03<br>[3.04]***   | 0.03<br>[3.18]***   | 0.02<br>[2.49]**    |
| Log of petroleum price                            | 0.90<br>[1.70]*    | 0.91<br>[1.73]*    | 0.01<br>[0.13]      | 0.02<br>[0.17]      | 0.05<br>[0.52]      |
| Log of IMF quota share                            | 6.19<br>[4.51]***  | 6.25<br>[4.58]***  | -0.38<br>[-1.33]    | -0.42<br>[-1.47]    | -0.07<br>[-0.28]    |
| UN voting affinity with the United States         | 1.61<br>[2.61]***  | 1.61<br>[2.61]***  | -0.02<br>[-0.21]    | -0.02<br>[-0.22]    | -0.04<br>[-0.38]    |
| Democracy Dummy                                   | 0.14<br>[0.31]     | 0.15<br>[0.32]     | -0.11<br>[-1.23]    | -0.12<br>[-1.37]    | -0.08<br>[-1.05]    |
| Amount of Loan over Quota                         |                    |                    | -0.00<br>[-2.89]*** | -0.00<br>[-2.81]*** |                     |
| Observations                                      | 372                | 372                | 183                 | 183                 | 407                 |
| log likelihood label                              | -138.1             | -138.0             | -602.9              | -602.8              | -621.7              |
| z-statistics in brackets                          |                    |                    |                     |                     |                     |
| *** p<0.01, ** p<0.05, * p<0.1                    |                    |                    |                     |                     |                     |
| Coefficients for country dummies are not reported |                    |                    |                     |                     |                     |



**Table 4: Are Major Programs Different?**

| LABELS                                    | (1)<br>Clogit      | (2)<br>Poisson      | (3)<br>CPoisson     |
|---|--------------------|---------------------|---------------------|
| New Crisis in First Quarter               | -0.13<br>[-0.42]   | -0.05<br>[-1.02]    | -0.04<br>[-0.89]    |
| New Crisis in Second Quarter              | 0.62<br>[2.03]**   | 0.08<br>[1.58]      | 0.06<br>[1.20]      |
| Existing program dummy                    | -0.62<br>[-2.12]** | 0.22<br>[4.04]***   | 0.16<br>[3.34]***   |
| Crisis Severity                           | 0.26<br>[2.07]**   | -0.12<br>[-4.58]*** | -0.12<br>[-4.73]*** |
| Fixed Exchange Rate                       | -0.43<br>[-0.94]   | -0.16<br>[-1.84]*   | -0.16<br>[-1.97]**  |
| Federal funds rate                        | -0.08<br>[-1.47]   | 0.03<br>[3.30]***   | 0.02<br>[2.57]**    |
| Log of petroleum price                    | 1.01<br>[1.88]*    | -0.00<br>[-0.01]    | 0.04<br>[0.44]      |
| Log of IMF quota share                    | 6.22<br>[4.60]***  | -0.41<br>[-1.43]    | -0.07<br>[-0.27]    |
| UN voting affinity with the United States | 1.56<br>[2.52]**   | -0.01<br>[-0.11]    | -0.03<br>[-0.29]    |
| Democracy Dummy                           | 0.11<br>[0.24]     | -0.12<br>[-1.37]    | -0.08<br>[-1.04]    |
| Amount of Loan over Quota                 |                    | -0.00<br>[-2.60]*** |                     |
| Major Crises                              | 0.55<br>[1.98]**   | -0.06<br>[-1.21]    | -0.06<br>[-1.33]    |
| Observations                              | 372                | 183                 | 407                 |
| log likelihood label                      | -136.0             | -602.0              | -620.8              |

z-statistics in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Coefficients for country dummies are not reported

**Table 5: Major and Non Major crises**

| LABELS                                    | (1)                 | (2)               | (3)                  | (4)                 | (5)                   | (6)                 |
|---|---------------------|-------------------|----------------------|---------------------|-----------------------|---------------------|
|   | Clogit<br>Non Major | Clogit<br>Major   | Poisson<br>Non Major | Poisson<br>Major    | CPoisson<br>Non Major | CPoisson<br>Major   |
| New Crisis in First Quarter               | -0.58<br>[-1.17]    | -0.10<br>[-0.19]  | -0.04<br>[-0.50]     | 0.03<br>[0.27]      | -0.05<br>[-0.61]      | 0.01<br>[0.15]      |
| New Crisis in Second Quarter              | 0.49<br>[1.15]      | 1.38<br>[1.90]*   | 0.24<br>[3.04]***    | -0.01<br>[-0.07]    | 0.18<br>[2.84]***     | 0.10<br>[0.98]      |
| Existing program dummy                    | -0.19<br>[-0.47]    | -1.02<br>[-1.66]* | 0.26<br>[3.28]***    | 0.28<br>[2.26]**    | 0.16<br>[2.49]**      | 0.21<br>[2.26]**    |
| Crisis Severity                           | 0.38<br>[1.21]      | 0.37<br>[1.88]*   | -0.31<br>[-3.81]***  | -0.17<br>[-3.93]*** | -0.18<br>[-3.56]***   | -0.14<br>[-4.27]*** |
| Fixed Exchange Rate                       | -0.18<br>[-0.27]    | -1.50<br>[-1.25]  | -0.33<br>[-2.73]***  | 0.10<br>[0.50]      | -0.34<br>[-3.03]***   | -0.07<br>[-0.44]    |
| Federal funds rate                        | -0.07<br>[-0.87]    | -0.22<br>[-1.69]* | 0.05<br>[3.42]***    | 0.06<br>[2.40]**    | 0.03<br>[2.32]**      | 0.04<br>[2.18]**    |
| Log of petroleum price                    | 0.74<br>[0.95]      | 1.43<br>[1.19]    | -0.07<br>[-0.42]     | -0.29<br>[-1.20]    | 0.09<br>[0.67]        | -0.23<br>[-1.38]    |
| Log of IMF quota share                    | 7.31<br>[3.31]***   | 6.26<br>[2.14]**  | -0.58<br>[-1.37]     | -0.77<br>[-1.27]    | 0.16<br>[0.48]        | -0.04<br>[-0.10]    |
| UN voting affinity with the United States | 0.72<br>[0.79]      | 1.71<br>[1.38]    | 0.32<br>[1.78]*      | -0.58<br>[-2.24]**  | 0.26<br>[1.81]*       | -0.42<br>[-2.03]**  |
| Democracy Dummy                           | 0.69<br>[1.06]      | -0.02<br>[-0.02]  | -0.09<br>[-0.65]     | -0.23<br>[-1.30]    | -0.01<br>[-0.12]      | -0.22<br>[-1.54]    |
| Amount of Loan over Quota                 |                     |                   | 0.00<br>[0.12]       | -0.00<br>[-2.29]**  |                       |                     |
| Observations                              | 183                 | 112               | 101                  | 82                  | 246                   | 161                 |
| log likelihood label                      | -64.88              | -30.92            | -299.9               | -253.0              | -315.0                | -264.9              |

z-statistics in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Coefficients for country dummies are not reported

**Table 6: Changes Over time**

| LABELS                                    | (1)<br>Clogit      | (2)<br>Poisson      | (3)<br>CPoisson     |
|---|--------------------|---------------------|---------------------|
| New Crisis in First Quarter               | -0.07<br>[-0.24]   | -0.05<br>[-1.02]    | -0.04<br>[-0.86]    |
| New Crisis in Second Quarter              | 0.53<br>[1.77]*    | 0.08<br>[1.62]      | 0.06<br>[1.30]      |
| Existing program dummy                    | -0.61<br>[-2.10]** | 0.24<br>[4.31]***   | 0.18<br>[3.70]***   |
| Crisis Severity                           | 0.30<br>[2.48]**   | -0.12<br>[-4.79]*** | -0.12<br>[-5.00]*** |
| Fixed Exchange Rate                       | -0.48<br>[-1.06]   | -0.14<br>[-1.61]    | -0.14<br>[-1.74]*   |
| Federal funds rate                        | -0.09<br>[-1.56]   | 0.03<br>[3.19]***   | 0.02<br>[2.30]**    |
| Log of petroleum price                    | 0.76<br>[1.33]     | -0.09<br>[-0.77]    | -0.05<br>[-0.47]    |
| Log of IMF quota share                    | 5.86<br>[4.00]***  | -0.68<br>[-2.08]**  | -0.29<br>[-1.10]    |
| UN voting affinity with the United States | 1.37<br>[1.88]*    | -0.11<br>[-0.87]    | -0.13<br>[-1.15]    |
| Democracy Dummy                           | 0.18<br>[0.39]     | -0.10<br>[-1.12]    | -0.07<br>[-0.88]    |
| Amount of Loan over Quota                 |                    | -0.00<br>[-2.67]*** |                     |
| Dummy year>1986                           | -0.29<br>[-0.64]   | -0.15<br>[-1.66]*   | -0.14<br>[-1.81]*   |
| Observations                              | 372                | 183                 | 407                 |
| log likelihood label                      | -137.8             | -601.4              | -620.1              |

z-statistics in brackets

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Coefficients for country dummies are not reported

| LABELS                                    | (1)                   | (2)                  | (3)                    | (4)                   | (5)                     | (6)                    |
|---|-----------------------|----------------------|------------------------|-----------------------|-------------------------|------------------------|
|   | Clogit<br>Before 1986 | Clogit<br>After 1986 | Poisson<br>Before 1986 | Poisson<br>After 1986 | CPoisson<br>Before 1986 | CPoisson<br>After 1986 |
| New Crisis in First Quarter               | 2.28<br>[2.24]**      | 0.14<br>[0.31]       | -0.11<br>[-1.27]       | 0.11<br>[1.12]        | -0.03<br>[-0.36]        | 0.03<br>[0.35]         |
| New Crisis in Second Quarter              | -0.66<br>[-0.74]      | 1.17<br>[2.41]**     | 0.20<br>[2.33]**       | -0.26<br>[-2.74]***   | 0.18<br>[2.42]**        | -0.15<br>[-2.15]**     |
| Existing program dummy                    | -3.18<br>[-2.50]**    | -1.12<br>[-2.38]**   | 0.28<br>[3.13]***      | 0.15<br>[1.46]        | 0.14<br>[1.89]*         | 0.06<br>[0.76]         |
| Crisis Severity                           | 0.32<br>[1.25]        | 0.43<br>[1.90]*      | -0.03<br>[-0.78]       | -0.18<br>[-3.97]***   | -0.04<br>[-1.26]        | -0.15<br>[-3.85]***    |
| Fixed Exchange Rate                       | 0.15<br>[0.15]        | -0.87<br>[-1.26]     | -0.04<br>[-0.35]       | -0.65<br>[-3.61]***   | -0.06<br>[-0.49]        | -0.64<br>[-3.96]***    |
| Federal funds rate                        | -0.40<br>[-2.30]**    | -0.28<br>[-2.00]**   | 0.03<br>[1.90]*        | 0.07<br>[1.96]**      | 0.01<br>[0.97]          | 0.02<br>[0.81]         |
| Log of petroleum price                    | 3.51<br>[1.96]**      | -0.11<br>[-0.12]     | -0.26<br>[-1.35]       | 0.16<br>[0.71]        | -0.08<br>[-0.46]        | 0.02<br>[0.14]         |
| Log of IMF quota share                    | -3.18<br>[-0.50]      | 9.88<br>[3.01]***    | -0.72<br>[-0.83]       | -2.77<br>[-3.65]***   | -0.83<br>[-1.03]        | -0.65<br>[-1.44]       |
| UN voting affinity with the United States | 2.14<br>[1.00]        | 1.98<br>[1.47]       | -0.09<br>[-0.33]       | -0.57<br>[-2.22]**    | 0.01<br>[0.03]          | -0.15<br>[-0.76]       |
| Democracy Dummy                           | 0.60<br>[0.39]        | -0.60<br>[-0.70]     | 0.31<br>[1.89]*        | -0.57<br>[-3.08]***   | 0.13<br>[1.02]          | -0.47<br>[-2.86]***    |
| Amount of Loan over Quota                 |                       |                      | 0.00<br>[0.52]         | -0.00<br>[-3.33]***   |                         |                        |
| Observations                              | 85                    | 183                  | 89                     | 94                    | 144                     | 263                    |
| log likelihood                            | -20.66                | -55.31               | -268.9                 | -265.0                | -276.1                  | -286.5                 |

z-statistics in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Coefficients for country dummies are not reported

## Data Appendix

The dependent variable (Spell) is the number of months between the first ‘crisis’ that occurred in a time window of two years preceding the month of approval of an IMF programme. Thus the maximum value that this variable can take is 24. To define a crisis we construct an indicator proposed in Kaminsky and Reinhart (1999). This index is constructed as:

$$I = \frac{\Delta e}{e} - \frac{\sigma_e}{\sigma_R} \cdot \frac{\Delta R}{R}$$

Where  $R$  is the monthly level of reserves and  $e$  is the monthly exchange rate.  $\sigma_e$  and  $\sigma_R$  are, respectively, the standard deviations of the exchange rate changes and of the reserves changes. A crisis month is one in which the index is off its mean by at least a standard deviation.

Countries included in the study are the following: Algeria, Argentina, Bolivia, Brazil, Bulgaria, Cameroon, Central African Republic, Chile, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Gabon, Gambia, Ghana, Guatemala, Haiti, Honduras, Hungary, India, Indonesia, Jamaica, Jordan, Kenya, Latvia, Lithuania, Madagascar, Malawi, Mauritius, Mexico, Morocco, Myanmar, Niger, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Russia, Senegal, Sudan, Tanzania, Thailand, Togo, Turkey, Uruguay, Venezuela.

The variables used in the study and their sources are described in the following table:

| Variable                 | Description and Source   |
|--------------------------|--|
| Consumer Price Index     | IFS, serie (64...zf)   |
| Exchange Rate            | National Currency Per US Dollar. Monthly Periodicity (end of period). IFS, serie (..AE..ZF).   |
| Reserves                 | Total Reserves minus Gold. Millions of Dollars. Monthly Periodicity. IFS, serie (.IL.DZF).   |
| Petroleum Price          | World Petroleum Spot Price Index. Monthly Periodicity. IFS, serie (001176AADZF).   |
| US Federal Funds Rates   | Percentage Points. Monthly Periodicity. IFS, serie (11160B...ZF)   |
| Fixed Exchange Rate      | Dummy variable indicating the existence of a fixed exchange rate defined as in Shambaugh (2004).   |
| IMF quota share          | Participation of each country's quota in the total of quotas of countries included in the analysis. In percentage points. IFS, serie (.ZF.SZF)   |
| UN voting                | Data ranges from -1 (least similar interests) to 1 (most similar interests). Constructed following "The Affinity of Nations Index database". Erik Gartzke, Columbia University. Raw data is provided by Erik Voeten and Adis Merdzanovic, "United Nations General Assembly Voting Data". <a href="http://www9.georgetown.edu/faculty/ev42/UNVoting.htm">http://www9.georgetown.edu/faculty/ev42/UNVoting.htm</a> |
| Sudden Stops             | As in Eichengreen, Gupta and Mody (2008).  |
| GDP per capita           | PPP terms. From Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.2, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, September 2006.   |
| Growth                   | Growth of GDP per Capita in PPP terms. Same source as GDP per capita.  |
| PolconIII                | Estimates the constraints imposed by veto points. Available at: <a href="http://www-management.wharton.upenn.edu/henisz/">http://www-management.wharton.upenn.edu/henisz/</a>  |
| PolconV                  | Similar to PolconIII but also includes two additional veto points: the judiciary and sub-federal entities. Available at: <a href="http://www.management.wharton.upenn.edu/henisz">www.management.wharton.upenn.edu/henisz</a>  |
| Democracy                | Dummy variable indicating democratic regime as in Cheibub et al. Available at: <a href="http://www9.georgetown.edu/faculty/jrv24/DD.html">http://www9.georgetown.edu/faculty/jrv24/DD.html</a>   |
| Democracy (Alternative)  | Presence of institutions and procedures through which citizens can express their preferences about alternative policies and leaders. Increasing scale from -10 to +10. Source: Polity IV Project, Center for Global Policy, School of Public Policy, George Mason University.  |
| Capital Account Openness | The Chinn-Ito index of capital account openness based on the IMF's detailed tabulations of restrictions on cross-border transactions in its annual <i>Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)</i> . <a href="http://www.ssc.wisc.edu/~mchinn/Readme_kaopen163.pdf">www.ssc.wisc.edu/~mchinn/Readme_kaopen163.pdf</a> .   |
| Trade Openness           | Measured as the ratio of trade(exports plus imports)-to-GDP. Source: World Bank, World Development Indicators.   |