Political Business Cycles and Inflation Stabilization*

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Abstract

When the choice of the nominal anchor and timing of inflation stabilization is analyzed with models of political business cycles, there is room for political opportunism of policymakers. The different business cycles associated with exchange rate-based (ERBS) and money-based stabilizations (MBS) imply that the decision regarding the timing and nominal anchor of stabilization may be affected by the timing of elections. Namely, an opportunistic policymaker is more likely to implement an ERBS than a MBS before elections, while the opposite happens after elections. Empirical results obtained when estimating a multinomial logit model for a sample of 35 stabilization programs implemented in chronic inflation countries clearly support this hypothesis.

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1. Introduction

Contrary to the conventional wisdom that inflation stabilization has short-run contractionary effects, studies focusing on chronic inflation countries showed that exchange rate-based stabilization (ERBS) often leads to an initial expansion in economic activity, particularly in output and consumption, with the recession occurring later on. The short-run recessionary effects typically associated with disinflation tend to happen quickly only in money-based stabilizations (MBS). Thus, the choice of the nominal anchor can be interpreted as a choice between recession now and recession later.

When the decision regarding the anchor and timing of stabilization is included in models of political business cycles, there is room for political opportunism of policymakers. That is, the timing and the nominal anchor of stabilization may be affected by the timing of elections. Following Stein and Streb (1998) and Aisen (2002), we hypothesize that an opportunistic policymaker is more likely to implement an ERBS than a MBS before elections, while the opposite happens after elections. The hypothesis that the election cycle affects both the timing and the choice of the nominal anchor of stabilization will be tested estimating a multinomial logit model for a sample of 35 stabilization programs implemented in chronic inflation countries since the late 1950s. The potential effects of initial economic conditions and of some political variables on the choice of the timing and nominal anchor of stabilization will also be considered.

This approach is preferable to that of Aisen (2002), who uses a probit model to estimate the effects of several variables on the probability of implementing an ERBS versus a MBS, assuming that the decision to stabilize was already taken. First, it may not be correct to assume that the decision to stabilize precedes the choice of the nominal anchor. An opportunistic policymaker will compare the political advantages of implementing an ERBS to those of a MBS or not stabilizing. Unless the costs of inflation are unbearable, he or she

will not commit to a stabilization program before knowing whether an ERBS or a MBS are preferable to not stabilizing. Thus, the timing and anchor of stabilization should be decided at the same time. Second, Veiga (2000) showed that the timing of inflation stabilization programs is affected by political variables like the degree of fragmentation of the political system. It is quite possible that it is also affected by the timing of elections. By allowing the possibility of not stabilizing, our model also estimates the effects of the timing of elections and of several other variables on the timing of stabilizations.

Our results regarding the choice of the nominal anchor confirm those of Aisen (2002). That is, the probability of adopting an ERBS versus a MBS is greater shortly before elections while the opposite happens shortly after elections. But, it should be noted that his assumption that the choice of the anchor happens after the decision to stabilize was taken implies that the election cycle does not affect the timing of stabilization. Our results for the contrast MBS/NS clearly show that the timing of a MBS is affected by the electoral cycle. As previously stated, the probability of adopting a MBS versus not stabilizing is greater immediately after elections.

The paper is organized as follows. Section 2 reviews the main findings of studies focusing on the real effects of the choice of the nominal anchor of stabilization. Section 3 presents some political business cycles models and relates them to the choice of the nominal anchor. The data and the econometric model are described in section 4 and the empirical findings are presented in section 5. Finally, section 6 concludes the paper.

2. Real effects of the choice of the nominal anchor of inflation stabilization

Although inflation stabilization in low inflation economies is usually associated with significant short-run output costs, that is not necessarily the case for countries suffering from hyperinflation or chronic inflation.[1] Sargent (1982) argued that the hyperinflations of the 1920s in Austria, Germany, Poland and Hungary were stopped with little or no output costs by using the exchange rate as the nominal anchor of stabilization. Végh (1992) analyses eight hyperinflations from 1922 to 1985 presenting further evidence that hyperinflations have been stopped almost immediately and with relatively small output costs following exchange rate-based stabilization.

Kiguel and Leviatan (1992) and Végh (1992) showed that the relation between disinflation and output in chronic inflation countries depends of the nominal anchor of the stabilization program. Exchange rate-based stabilizations (ERBS) were generally associated with an initial expansion of output followed by a recession later on, while money-based stabilizations (MBS) would lead to an immediate recession and a recovery later on. Thus, when choosing the nominal anchor of stabilization a policymaker is also choosing the timing of recession and expansion: a MBS brings recession now, while an ERBS brings recession later. Calvo and Végh (1999) find evidence in favor of this "recession-now-versus-recession-later" hypothesis using a sample of 14 stabilizations (9 ERBS and 5 MBS) implemented in 8 chronic inflation countries.[2]

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[1] Hyperinflation corresponds to a monthly inflation rate of at least 50%, and tends to have a short duration (sometimes, just a few months). Chronic inflation is a situation of high inflation relative to that of industrial countries that lasts for a long period of time (for several years).

[2] Hoffmaister and Végh (1996) test this hypothesis for Uruguay using VAR estimations and also find evidence in favor of the "recession-now-versus-recession-later" hypothesis. See Rebelo and Végh (1995) for a study on the real effects of exchange rate-based stabilizations.

A dissenting view is presented by Easterly (1996) and Hamann (2001), who find stabilization to be expansionary, regardless of the nominal anchor used. The different results may be a consequence of the use of different methodologies used to construct samples. While the present paper and those referred to in the paragraphs above follow the so-called "episodic" approach, selecting the stabilizations that have received greater attention in the literature, Easterly (1996) and Hamann (2001) follow the "mechanical" approach. That is, they identify stabilizations according to a mechanical rule for the behavior of inflation. The result is a very different sample, including many more countries but excluding several unsuccessful stabilization plans that took place in chronic inflation countries.[3]

Another dissenting view is presented by Gould (1999), who argues that after adjusting for initial conditions the choice of the nominal anchor becomes endogenous and growth improves regardless of the anchor used. Countries with an ample stock of international reserves, higher inflation-fighting credibility, and better prospects for economic growth (growth above trend) can implement exchange rate-based stabilizations, while countries that lack these characteristics are left with money-based stabilizations. Thus, ERBS are implemented in good times and MBS are implemented in bad times. Following the episodic approach of sample construction, Gould (1999: 3) finds that "after controlling for the level of international reserves and inflation, growth after monetary-based stabilizations does not differ significantly from growth following exchange rate-based stabilizations."

[3] These results are contradicted by Fisher, Sahay, and Végh (2002), who use a somewhat mechanical approach to define a sample of 27 stabilizations following 45 episodes of very high inflation that took place in 25 countries. They find that the expansionary effects of stabilization are due essentially to the ERBS present in their sample. That is, the ERBS lead to an initial boom in output and consumption, while the non-ERBS (MBS and those that defy a clear classification) are not expansionary.

3. Political Business Cycles and the choice of the nominal anchor

The different business cycles generated by ERBS and MBS, combined with the electoral cycles of democratic regimes may give rise to an opportunistic behavior of politicians regarding the choice of the nominal anchor of stabilization. That is, in a situation of high inflation, when a stabilization program is clearly necessary, the choice of the nominal anchor may depend of the current phase of the electoral cycle. For example, a politician seeking reelection may not be interested in implementing a MBS shortly before an election because the recession it causes could lead to a loss of votes. In contrast, an ERBS, that reduces inflation and increases growth, could make the policymaker look more competent in the eyes of the electorate and help win the elections. Thus, an opportunistic politician would prefer to implement an ERBS shortly before elections and a MBS after elections.

This opportunistic behavior can be justified by the political business cycle literature.[4] The seminal model is due to Nordhaus (1975), who assumed a stable Phillips curve, adaptative expectations, retrospective behavior of voters, and opportunistic policymakers. In this setting, the incumbent would stimulate the economy toward the end of his/her term in order to win the elections. The resulting higher inflation before elections would be reduced with restrictive policies after the elections. Thus, one would observe high growth and low unemployment before elections and a recession after them.

Rogoff and Sibert (1988) developed a rational expectations model in which the ability of different incumbents to generate favorable economic outcomes varies. Since knowledge of ability is private information, competency cannot be observed directly by the electorate. Thus, the effort of politicians to appear as competent as possible can lead to a political business cycle. But, voter's rationality and knowledge of politicians' incentives may make

[4] For surveys of this literature see Alesina, Cohen and Roubini (1997), Drazen (2000), and Person and Tabellini (2000).

these political business cycles smaller in magnitude, shorter-lived, and less regular than in Nordhaus' (1975) model. In Alesina and Cukierman (1990), voters are not fully informed about the incumbent's preferences and do not observe his/her policy actions directly. However, since policy outcomes are positively correlated with policy actions, they convey information about the incumbent's preferences. Therefore, the assumption of persistence of preferences implies that voters can draw inferences about future policies and outcomes by looking at current economic conditions. Again, there is an incentive to generate political business cycles.

Harrington (1993) combines the two above-mentioned models by assuming that voters are uncertain about the effectiveness of policy actions, the incumbent's future policy intentions, and which policy the incumbent believes is best. Voters' preferences are endogenous and may change as new information is released. In such a setting, the electorate will be more sensitive to policy actions (as in Rogoff and Sibert, 1988) when it feels more confident about which policy is best, or more able to identify the consequences of policy actions. Voting behavior will be more performance-based (as in Alesina and Cukierman, 1990) when voters are more uncertain about the effectiveness of the policies chosen.

Stein and Streb (1998) developed a competency model for high inflation economies based on performance-based voting behavior. In their model, inflation reduction with low output costs signals competency of the government. Given the business cycles associated with the choice of the nominal anchor of stabilizations, the absence of short-run costs of higher unemployment and lower growth provide strong incentives for policymakers to reduce inflation before elections by implementing exchange rate-based stabilizations.

4. The data and the econometric model

The previous sections imply that when the decision regarding the choice of the nominal anchor of inflation stabilization in chronic inflation countries is incorporated in models of political business cycles, there is a tendency for opportunistic behavior of policymakers, expressed in the implementation of exchange rate-based stabilizations before elections and money-based stabilizations after elections. The existence of this effect of the timing of elections on the choice of the nominal anchor and on the timing of inflation stabilization is the main hypothesis that will be tested in the present paper.

For that purpose we constructed a dataset composed of quarterly data from the first quarter of 1957 to the fourth quarter of 1999, for 10 countries that experienced chronic inflation and implemented stabilization programs during this period. The first major issue to consider when constructing the dataset is to determine when a stabilization program has been implemented. The method consisted in searching the economics literature for information on the starting dates of stabilization programs undertaken in countries suffering from chronic inflation. The 44 stabilizations identified are described in table 1. In that table, the quarter of implementation, the type, and the main data sources for identifying the stabilization for each program are also indicated.

<< Insert Table 1 around here >>

Since we are interested in testing whether the electoral cycle affects the choice of the nominal anchor and the timing of stabilization, only the programs whose implementation was preceded and followed by elections are included in the sample. These are the ones whose date/name appears in bold in the second column of table 1. That is, the nine programs implemented during dictatorships or followed by dictatorships (instead of elections) are

excluded. Thus, the sample used in the estimations includes 35 stabilizations, 29 ERBS and 6 MBS, implemented in eight countries. We will also perform estimations on a restricted sample of "Major Stabilization Programs," that is, those that received greater attention in the literature. Table 2 describes the 23 major programs identified, with those that occurred between elections, the 15 included in the restricted sample, indicated in bold.

<< Insert Table 2 around here >>

Considering that it makes more sense to test for the probability of implementing a stabilization program when it is clearly necessary, we decided to use the quarters of high inflation as our baseline sample. Thus, the second major issue to solve when constructing the sample was to determine when inflation was "high". Following Veiga (2000), inflation was considered high when it was over twice the average inflation rate of the last 10 years (and above 25%) or greater than or equal to 100%.[5]

Before choosing the appropriate econometric model it was necessary to identify the alternative decisions a policymaker could make in each quarter. We assumed that, in a situation of high inflation, the policymaker could do one of the following: (1) start an exchange rate-based stabilization (ERBS); (2) start a money-based stabilization (MBS); or postpone the necessary stabilization program (NS – no stabilization). Since there are three alternatives, the econometric model chosen was the Multinomial Logit.[6]

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[5] We always include in our sample the quarter in which a stabilization program was implemented, regardless of the inflation rate. Although that could potentially lead to the inclusion of several quarters in which inflation was not high according to our definition, the only such case in our sample is Mexico 1976:4 (ERBS).

[6] This econometric model was also chosen by Gould (1999).

In our opinion, this model is preferable to the probit specification of Aisen (2002), who estimates the effect of several variables on the probability of implementing an ERBS instead of a MBS, assuming that the decision to start a stabilization program was taken previously. First, we think that it is not correct to assume that the decision to stabilize precedes the choice of the nominal anchor. An opportunistic policymaker will always compare the political advantages of implementing an ERBS to those of starting a MBS or not stabilizing, which means that the decision to stabilize is taken simultaneously with the choice of the anchor. Unless the costs of inflation are unbearable, it does not make sense to commit to a stabilization program before knowing whether an ERBS or a MBS are preferable to not stabilizing. Second, as shown by Veiga (2000) the timing of stabilizations is strongly affected by political variables, like the degree of fragmentation of the political system. It is quite possible that it is also affected by the timing of elections, which means that Aisen's (2002) assumption that the inflationary history of the country will determine the exact moment to launch the nominal anchor to stabilize inflation may be an exaggerated simplification of reality. By allowing the policymaker the option of not stabilizing, our model also estimates the effects of the electoral cycle and of other factors on the timing of stabilization. [7]

The multinomial logit model[8] describes the probability that certain event j will occur, which is determined by a set of attributes or characteristics included in vector X_i. The estimated equations supply a set of probabilities for $J+1$ choices. In the present case there are three possible alternatives: ERBS, MBS or NS. Thus, the probabilities are:

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[7] The results shown in Table 4 clearly show that, even controlling for inflation and other variables, the probability of implementing a MBS versus not stabilizing (NS) decreases as the next elections come closer. Thus, the timing of stabilizations is affected by the electoral cycle.

[8] For a more complete description of this model see Greene (2000) and Long (1997).

$$\text{Prob}(STAB_i = j \mid X_i) = \frac{e^{X_i'\beta_j}}{1 + \sum_{K=1}^{2} e^{X_i'\beta_k}}, \quad \text{for} \quad j = 1, 2,$$
$$\text{Prob}(STAB_i = 0 \mid X_i) = \frac{1}{1 + \sum_{K=1}^{2} e^{X_i'\beta_k}}, \tag{1}$$

where *STAB*, the dependent variable, equals 2 for an ERBS, 1 for a MBS, and zero if no stabilization is implemented (NS). This model can also be expressed in terms of the odds. The odds of outcome *j* versus outcome *k* are equal to:

$$\frac{\text{Prob}(STAB_i = j)}{\text{Prob}(STAB_i = k)} = e^{X_i'(\beta_j - \beta_k)}. \tag{2}$$

In the context of the present study, the difference $\beta_1 - \beta_2$, called a contrast, is the effect of the independent variable *X* on the logit of outcome 1 (MBS) versus outcome 2 (ERBS). If one of the independent variables changes by one unit (for instance X_m), we may interpret this change in terms of an *odds ratio*, i.e. the ratio of the odds before and after the change in X_m. This effect will be equal to $e^{\beta_{mj} - \beta_{mk}}$. Thus, in this study, the *odds ratio* can be interpreted as follows: for a unit change in X_m, the odds are expected to change by a factor of $e^{\beta_{m1} - \beta_{m2}}$, holding all other variables constant.[9]

The multinomial logit model is estimated by maximum likelihood. The log-likelihood can be derived by defining, for each individual, $d_{ij}=1$ if alternative *j* is chosen by individual *i*, and 0 if not, for the *J+1* possible choices. The log-likelihood is a generalization of that for the binomial logit model:

$$\log L = \sum_{i=1}^{n} \sum_{j=0}^{J} d_{ij} \log\left[\text{Prob}(STAB_i = j)\right]. \tag{3}$$

[9] See Long (1997: 169) for the interpretation of the odds ratios.

Maximizing (3) in order to β_j we obtain the maximum likelihood estimates. Since we are considering three possible choices, the number of estimated coefficients is twice that of the binary logit model.

The dependent variable and all independent variables are described in table 3. The explanatory variables used in our baseline model are the following:

- *PCR - Political Cycle Ratio*: number of quarters since the last elections divided by the number of quarters to the next elections;[10]
- *TR/Imp – Ratio of Total Reserves to Imports*;
- *?Inf – Change in the Inflation rate since the same quarter of the previous year*;
- *GDP>T – GDP growth above the trend growth rate*: dummy variable that takes the value of one if the growth rate of real GDP since the same quarter of the previous year is greater than the Trend (Hodrick-Prescott) growth rate of GDP, and takes the value of zero otherwise.
- *FB/GDP – Fiscal Balance (Government Budget Balance) as a percentage of GDP*;
- *IMFProg – Presence of an IMF program*: dummy variable that equals one if there is an ongoing arrangement with the IMF, and equals zero otherwise.

<< Insert Table 3 around here >>

Since a MBS leads to a recession in the short run, a politician who wishes to be re-elected will not adopt it just before an election. Instead, this would be the ideal occasion to implement an ERBS since its expansive effects, together with the reduction of the inflation

[10] Only the presidential elections are considered in presidential systems and only the legislative elections are considered in parliamentary systems (Israel and Turkey).

rate, would increase the policymaker's popularity and help him/her win the elections. Thus, we expect *PCR* to have a negative coefficient for the contrasts MBS/NS and MBS/ERBS, and a positive coefficient for the contrast ERBS/NS.

Gould (1999) argues that the choice of the anchor depends of the initial economic conditions. More precisely, low growth relative to trend, low stock of international reserves and high inflation would favor the implementation of a MBS instead of an ERBS. These hypotheses imply negative coefficients for *TR/Imp* and *GDP>T* for the contrasts MBS/ERBS and MBS/NS, and positive coefficients for ERBS/NS. Concerning inflation, we conjecture that its growth affects the timing and nominal anchor of stabilization to a greater degree than its level, because indexation schemes may reduce the costs of high inflation and the effect of the level of inflation on the decision to stabilize. Extending Gould's (1999) reasoning, and considering that higher inflation growth should increase the probability of implementing a stabilization program regardless of the nominal anchor, we hypothesize that inflation growth, *?Inf*, will have positive coefficients for all contrasts.

The fiscal balance as a percentage of GDP (*FB/GDP*) and the existence of an ongoing IMF program/arrangement (*IMFProg*) are not directly related to the models referred to in sections 2 and 3. Nevertheless, it is possible that they affect the timing and the choice of the nominal anchor of stabilization. For this reason, they will be included in the estimations as control variables.

5. Empirical results

Table 4 presents the baseline results of the multinomial logit estimations for the entire sample of 35 stabilization programs and for the restricted sample of 15 major programs. As already said above, we assume that, in a situation of high inflation, the policymaker can do one of the following: start a money-based stabilization (MBS); start an exchange rate-based

stabilization (ERBS); or not stabilizing (NS). Given these three alternatives, results are presented for the contrasts MBS versus NS, ERBS versus NS, and MBS versus ERBS. Most economic variables are lagged one period in order to avoid simultaneity problems and to account for the usual delays in the reporting of economic data. For each estimated coefficient, the factor changes in the odds ratios and the t-statistics are also indicated. Finally, the logarithm of the likelihood function, the Schwartz Bayesian Information Criterion (SBIC), the McFadden R^2, and the number of observations and stabilizations are reported.

<< Insert Table 4 around here >>

The political cycle ratio (*PCR*) is statistically significant for the first and last contrasts in both specifications, indicating (as expected) that the probability of adopting a MBS decreases (relative to NS and to ERBS) as elections come closer.[11] These results clearly support our main hypothesis and are consistent with the opportunistic behavior of policymakers described in Stein and Streb's (1998) model. *PCR* is not statistically significant for the contrast ERBS/NS, indicating that the timing of elections may not affect the decision to adopt an ERBS versus not stabilizing. That is, *PCR* may not matter much for the timing of an ERBS. In fact, there is greater dispersion of ERBS along the election cycle than of MBS. Most of the latter are concentrated in the first year after elections. When the choice concerns the nominal anchor of stabilization, as expected, the probability of adopting a MBS versus an ERBS is greater (smaller) when *PCR* is smaller (greater).

While these results regarding the choice of the nominal anchor confirm those of Aisen (2002), it should be noted that Aisen assumes that the choice of the anchor happens

[11] In terms of *odds ratios*, we can see that for the contrast MBS/ERBS, in the specification for all programs, a unit change in *PCR* leads to an expected change of the odds by a factor of 0.0427, *ceteris paribus.*

after the decision to stabilize was taken, which also implies that the election cycle does not affect the timing of stabilization. Our results for the contrast MBS/NS clearly show that the timing of a MBS is affected by the electoral cycle. As previously stated, the probability of adopting a MBS versus not stabilizing is greater immediately after elections.

The ratio of total reserves to imports (*TR/Imp*) is statistically significant in all but one estimation. As expected, a greater stock of reserves reduces the probability of choosing a MBS relative to an ERBS or to not stabilizing. In the results for all programs it also increases the probability of implementing an ERBS relative to not stabilizing. These results are consistent with Gould's (1999) argument that a higher level of reserves would lead to the adoption of an ERBS, while the lack of them would favor the adoption of a MBS.

The change in the inflation rate (?*Inf*) is statistically significant for the first and last contrasts. That is, as inflation accelerates the probability of implementing a MBS versus an ERBS or not stabilizing increases. GDP growth above the trend growth rate (*GDP>T*) increases the probability of adopting a MBS instead of an ERBS or not stabilizing when we use the sample of all 35 programs. In the specification for the 15 major programs, this variable is never statistically significant. These results contradict Gould (1999) that argued that growth above trend would favor the adoption of an ERBS versus a MBS.

The fiscal balance as a percentage of GDP (*FB/GDP*) does not seem to affect the choice of the nominal anchor. It is statistically significant only for the contrast ERBS/NS in the regression for all programs, indicating that a greater budget surplus (deficit) decreases (increases) the probability of implementing an ERBS. This may be due to the fact that many episodes of high inflation started with large budget deficits that were monetized. Thus, it is not strange that there is a budget deficit when an ERBS starts.

Finally, the existence of an ongoing IMF program/arrangement (*IMFProg*) does not seem to affect the timing or the choice of the nominal anchor of stabilization. The result

concerning the timing is consistent with those of Veiga (2000) that did not find evidence of effects of IMF financial support on the timing of stabilizations.

Sensitivity analysis to alternative samples is presented in table 5. Here, we focus our attention on the choice of the nominal anchor. Thus, only the results for the contrast MBS/ERBS are shown.[12] In columns 1 and 4, Israel and Turkey were excluded, so that we could see whether results changed when only Latin American countries were considered. Since there is no consensus on the classification of the Bolivian stabilization of 1985:3, we decided to check whether results change when it is classified as a MBS, as Ágenor and Montiel (1999) do (see columns 2 and 5). Finally, some authors argue that Bolivia is not a chronic inflation country, since inflation did not persist for many years and reached hyperinflation levels relatively fast. Thus, according to this view, Bolivia should be excluded from the sample. That was done in the estimations of columns 3 and 6. In all occasions results are very similar to those of table 4, which means that our conclusions regarding the influence of the political cycle and other variables remain the same.

<< Insert Table 5 around here >>

Tables 6.A and 6.B, present the results of a series of robustness tests for the contrast MBS/ERBS, using the sample of high inflation periods and all 35 stabilizations. The results of these 14 alternative estimations are consistent with those of table 4. Columns 1 to 4 show the results obtained when alternative indicators of the timing of elections are used. Of these, only the number of quarters to the next elections (*QNE*) is not statistically significant. All

[12] The results for the other contrasts are available upon request.

others indicate, as expected, that shortly after elections a MBS is more likely to be implemented than an ERBS.

<< Insert Table 5.A around here >>

In column 5, the variable *Frag*, which is a dummy variable for the least fragmented political systems, is included in the estimation. In Veiga (2000) greater fragmentation reduced the probability of implementing a stabilization program. Aisen (2002) argues that more political cohesion is necessary to implement a MBS than a ERBS, because of the real short term costs of the former. Our results indicate that the fragmentation of the political system does not affect the probability of adopting a MBS instead of an ERBS. Thus, political cohesion, which affects the timing and is essential to the ultimate success of a stabilization program, may not matter much for the choice of the nominal anchor.

The dummy variable *Right*, that equals one for a right or center-right government, is included in column 6 in order to account for partisan effects. Since rightist governments tend to care relatively less about growth and unemployment than left-wing ones (see Hibbs, 1977), the result that they are more prone to implement a MBS makes sense. But, there is no evidence that the long run costs of MBS are different to those of ERBS, which means that when long run welfare effects are considered, the political orientation of the government should not affect the choice of the nominal anchor of stabilization. This regression also indicates that a budget surplus (positive *FB/GDP*) and IMF assistance (*IMFProg*=1) favor the adoption of a MBS versus an ERBS. The latter result may be due to the fact that IMF arrangements generally imply restrictions of domestic credit and of money supply growth, which are more consistent with a MBS. Furthermore, an empirical regularity of ERBS is that they lead to the deterioration of the trade balance and current account balance (see Calvo and

Végh, 1999: 1546), aggravating the balance of payments disequilibria that IMF programs wish to fight. When the deviation from trend of total reserves (*TRdT*) is used instead of *TR/Imp* there is still evidence that fewer reserves favor the implementation of a MBS (see column 7).

The results of column 8 of table 6.B indicate that the level of inflation, *Inf*, does not affect the choice of the nominal anchor of stabilization. Thus, we did not find evidence of Gould's (1989) hypothesis that a MBS is preferred relative to an ERBS when inflation is higher. As stated above, the acceleration of inflation may be more important. In columns 9 and 10 we used real GDP growth (*GDP*) and the deviation from trend of real GDP (*GDPdT*) instead of *GDP>T*. These variables are statistically significant and have a positive sign, indicating again that the probability of implementation of a MBS versus an ERBS increases when the performance of GDP is better. Two alternative variables for IMF support are used in columns 11 and 12. Both the total Fund credit and loans outstanding as a percentage of imports (*TFC/Imp*) and the duration of IMF support (*Dur_aid*) are not statistically significant, meaning that the amount of credit and its duration may not affect the choice of the nominal anchor of stabilization. The degree of openness to international trade, *Open*, and the real exchange rate against the US dollar, *RER*, do not seem to matter either (see columns 13 and 14).

<< Insert Table 6.B around here >>

All the models referred to above were estimated for a sample containing all observations, that is, a sample that also includes the quarters in which inflation was not high according to our definition. Results, presented in table 7, show that all indicators of the timing of elections, except *QNE*, are statistically significant and have the expected signs.

That is, they provide further evidence that shortly after elections there is a greater probability of implementing a MBS versus an ERBS, while the opposite happens shortly before elections. The major difference regarding the results described above for high inflation quarters is that none of the other explanatory variables is statistically significant.

<< Insert Table 7 around here >>

6. Conclusions

There is clear evidence of opportunistic behavior of policymakers regarding the timing of stabilization and the choice of the nominal anchor. Empirical results obtained when estimating a multinomial logit model for a sample of 35 stabilization programs implemented in countries that suffered from chronic inflation show that a money-based stabilization (MBS) is more likely to be implemented shortly after elections, while the probability of adopting an exchange rate-based stabilization (ERBS) is greater shortly before elections. The theoretical justification of these empirical findings is based on the integration of the "recession-now-versus-recession-later" hypothesis in political business cycles models that assume information asymmetry. An opportunistic policymaker would implement an ERBS before elections because it reduces inflation and creates a boom at the same time, which makes the incumbent look more competent in the eyes of the electorate (see Stein and Streb, 1998). Since a MBS generates an immediate recession, it should be implemented shortly after elections, so that the recovery that follows later on takes place before the end of the incumbent's current term. Furthermore, except for the cases in which the incumbent was reelected, his/her predecessor may be blamed for the costs of stabilization.

While the results regarding the choice of the nominal anchor confirm those of Aisen (2002), the most evident innovation of this paper is that, by allowing the policymaker to opt

among implementing a MBS, an ERBS or not stabilizing, the effects of the timing of elections and of other factors on the timing of each type of stabilization programs are also analyzed. Results for the contrast MBS/NS clearly show that the timing of a MBS is affected by the electoral cycle. As previously stated, the probability of adopting a MBS versus not stabilizing is greater shortly after elections.

The fact that the evidence of opportunistic behavior is found after controlling for initial economic conditions (the lagged economic variables) contradicts Gould's (1999) argument that after controlling for these the choice of the nominal anchor becomes endogenous. Nevertheless, some initial conditions affect the choice between ERBS and MBS. As Gould (1999) suggested, the probability of implementing a MBS versus an ERBS is greater when the stock of international reserves is lower. However, there is no evidence that a MBS is more likely to be adopted when real GDP growth is bellow trend. In fact, our results show the opposite.

Concerning the other variables included in our baseline empirical model, an acceleration of inflation increases the probability of implementing a MBS versus an ERBS or not stabilizing. That is, sharp increases in the inflation rate tend to be fought against with monetary crunches (MBS) rather than with the control of the exchange rate (ERBS). The fiscal balance as a percentage of GDP does not seem to matter for the choice of the nominal anchor, but greater fiscal deficits increase the probability of implementing an ERBS versus not stabilizing. Finally, IMF financial support does not seem to affect the choice of the anchor nor the timing of stabilization. The lack of effects of IMF assistance on the timing of stabilization confirms the results obtained by Veiga (2000).

Despite our efforts to include in Table 1 all stabilization programs implemented in chronic inflation countries referred to in the literature, some less known programs may have been left out. Thus, we cannot be sure that our results apply to all countries in the world that

suffered from chronic inflation and implemented inflation stabilization programs. Another limitation of our sample is that the number of MBS adopted during democracy is very small (only 6) when compared to the number of ERBS (29). It is possible that specific circumstances related to these few cases bias the results. But, the fact the latter are very robust to sample and specification changes implies that this potential bias is small.

Although the mechanical approach of sample construction generally leads to the exclusion of several unsuccessful programs, it generates a sample that includes a greater number of countries and stabilizations. Despite our preference towards the episodic approach, an interesting extension of the present paper would be to compare the results presented here with those obtained when the stabilizations are identified by a mathematical rule instead of by searching the literature.

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Table 1: Stabilization Programs

Country	Program dates/names	Type	Sources
Argentina	**1958:4**	MBS	Kiguel and Leviatan (1988)
	1959:3	ERBS	Kiguel and Leviatan (1992)
	1967:1	ERBS	Kiguel and Leviatan (1992)
	1973:3	ERBS	Kiguel and Leviatan (1992)
	1976:2	MBS	Kiguel and Leviatan (1988)
	1978:4 (Tablita)	ERBS	Kiguel and Leviatan (1992)
	1985:2 (Austral I)	ERBS	Kiguel and Leviatan (1991)
	1986:3 (Primavera I)	ERBS	Kiguel and Leviatan (1991)
	1987:1 (February)	ERBS	Kiguel and Leviatan (1991)
	1987:4 (Austral II)	ERBS	Kiguel and Leviatan (1991)
	1988:3 (Primavera II)	ERBS	Kiguel and Leviatan (1991)
	1989:3 (BB)	ERBS	Heyman (1991)
	1989:4 (Bonex)	MBS	Calvo and Vegh (1999)
	1991:2 (Convertibility)	ERBS	Calvo and Vegh (1999)
Bolivia	**1982:4**	ERBS	Morales (1988)
	1984:2	ERBS	Morales (1988)
	1985:1	ERBS	Morales (1988)
	1985:3	ERBS	Morales (1988), Végh (1992)
Brazil	1964:1	ERBS	Calvo and Vegh (1999)
	1986:1 (Cruzado)	ERBS	Kiguel and Leviatan (1991)
	1987:2 (Bresser)	ERBS	Kiguel and Leviatan (1991)
	1988:2 (Gradualist)	ERBS	Kiguel and Leviatan (1991)
	1989:1 (Summer)	ERBS	Kiguel and Leviatan (1991)
	1990:1 (Collor)	MBS	Calvo and Vegh (1999)
	1994:3 (Real)	ERBS	Ágénor and Montiel (1999)
Chile	1975:2	MBS	Calvo and Vegh (1999)
	1978:1 (Tablita)	ERBS	Calvo and Vegh (1999)
Dominican Republic	**1990:3**	MBS	Calvo and Vegh (1999)
Israel	**1980:4 (Aridor I)**	ERBS	Razin (1991)
	1982:3 (Aridor II)	ERBS	Razin (1991)
	1983:4 (Cohen-Orgad)	ERBS	Razin (1991)
	1984:3 (Package Deal I)	ERBS	Razin (1991)
	1984:4 (Package Deal II)	ERBS	Razin (1991)
	1985:1 (Package Deal III)	ERBS	Razin (1991)
	1985:3 (Shekel)	ERBS	Calvo and Vegh (1999)
Mexico	**1976:4**	ERBS	Diaz and Tercero (1988)
	1987:4	ERBS	Calvo and Vegh (1999)
Peru	**1985:3**	ERBS	Agénor and Montiel (1999)
	1990:3	MBS	Calvo and Vegh (1999)
Uruguay	**1960:4**	MBS	Hoffmaister and Vegh (1996)
	1968:2	ERBS	Calvo and Vegh (1999)
	1978:4 (Tablita)	ERBS	Calvo and Vegh (1999)
	1990:4	ERBS	Calvo and Vegh (1999)
Turkey	1980:1	MBS	Rodrik (1991)

Notes: - ERBS – Exchange Rate-Based Stabilization; MBS – Money-Based Stabilization.
- The programs whose date/name appears in bold were implemented during election cycles. The others were implemented during dictatorships or followed by dictatorships.

Table 2: Major Stabilization Programs

Country	Program dates/names	Type
Argentina	**1959:3**	ERBS
	1967:1	ERBS
	1973:3	ERBS
	1978:4 (Tablita)	ERBS
	1985:2 (Austral I)	ERBS
	1989:4 (Bonex)	MBS
	1991:2 (Convertibility)	ERBS
Bolivia	**1985:3**	ERBS
Brazil	1964:1	ERBS
	1986:1 (Cruzado)	ERBS
	1990:1 (Collor)	MBS
	1994:3 (Real)	ERBS
Chile	1975:2	MBS
	1978:1 (Tablita)	ERBS
Dominican Republic	**1990:3**	MBS
Israel	**1985:3 (Shekel)**	ERBS
Mexico	**1987:4**	ERBS
Peru	**1990:3**	MBS
Uruguay	**1960:4**	MBS
	1968:2	ERBS
	1978:4 (Tablita)	ERBS
	1990:4	ERBS
Turkey	1980:1	MBS

Sources: see table 1.

Notes:
- ERBS = Exchange Rate-Based Stabilization;
- MBS = Money-Based Stabilization.
- The programs whose date/name appears in bold were implemented during election cycles. The others were implemented during dictatorships or followed by dictatorships.

Table 3: Description of the Variables Used

Dependent variable:

STAB = 0 if no stabilization program (NS) is implemented in the current quarter,
= 1 if a Money-Based Stabilization (MBS) is implemented, and
= 2 if an Exchange Rate-Based Stabilization (ERBS) is implemented.

Independent political variables:

PCR – Political Cycle Ratio: number of quarters since the last elections divided by the number of quarters to the next elections (presidential, in presidential systems; and legislative, in parliamentary systems).

QNE – Number of quarters to the next elections (presidential, in presidential systems; and legislative, in parliamentary systems).

QLE – Number of quarters since the last elections (presidential, in presidential systems; and legislative, in parliamentary systems).

NQLE – Normalized number of quarters since the last elections:

*NQLE = QLE*100 / (# quarters from the last to the next elections)*

ELY = 1 if the last elections (presidential, in presidential systems; and legislative, in parliamentary systems) occurred in the last year, and =0 otherwise.

Frag = 1 if there is a one-party majority parliamentary government or a presidential government, with the same party in control of the parliament (with an overall majority), and =0 for more fragmented political systems.

Right = 1 for a right or center-right oriented government, and =0 otherwise.

Independent Economic variables:

TR/Imp – Ratio of Total Reserves to Imports.

TRdT – Percentage deviation from Trend (Hodrick-Prescott) of Total Reserves.

Inf – Growth of CPI since the same quarter of the previous year.

?Inf – Change in inflation: *?Inf = ln(Inf) - ln(Inf(-1))*

GDP>T = 1 if the growth of real GDP since the same quarter of the previous year is greater than the Trend (Hodrick-Prescott) growth rate of GDP.

GDP - Growth of Real GDP since the same quarter of the previous year.

GDPdT – Percentage deviation from trend (Hodrick-Prescott) of real GDP.

FB/GDP – Fiscal Balance (Government Budget Balance) as a percentage of GDP.

IMFProg = 1 if there is an ongoing IMF program (arrangement), and =0 otherwise.

TFC/IMP – Total Fund (IMF) Credit and loans outstanding as a percentage of Imports.

Dur_aid – Duration of IMF financial support (number of quarters).

Open – Degree of openness to international trade: *Open=(Exports+Imports)/GDP*

RER – Real exchange rate appreciation against the US Dollar (index number that takes the value of 100 for the first observation available).

Sources:

- Dependent variable: see table 1.
- Political variables: Arthur Banks, ed., *Political Handbook of the World*, several issues; Gorvin (1989); Haggard and Kaufman (1992); McDonald and Ruhl (1989); Mainwaring and Scully (1995); *World Europa Yearbook*, Europa, several issues.
- Economic variables: *International Financial Statistics* - IMF. Quarterly data on Real GDP was also obtained from IBGE (Brazil) and INEGI (Mexico). Data on the timing of IMF arrangements was obtained from the *IMF Annual Report* (several issues) and on the IMF web page (http://www.imf.org).

Table 4: Timing and choice of the nominal anchor of stabilization programs

	All Programs			Major Programs		
	MBS/NS	**ERBS/NS**	**MBS/ERBS**	**MBS/NS**	**ERBS/NS**	**MBS/ERBS**
PCR	-3.22945	-0.076848	-3.15260	-3.97782	-0.062806	-3.91501
	[0.0396]	[0.9260]	[0.0427]	[0.0187]	[0.9391]	[0.0199]
	(-3.33)***	(-1.27)	(-3.25)***	(-2.92)***	(-0.72)	(-2.87)***
TR/Imp(-1)	-1.55898	0.459502	-2.01848	-0.961667	0.394075	-1.35574
	[0.2104]	[1.5833]	[0.1329]	[0.3823]	[1.4830]	[0.2578]
	(-2.36)**	(1.92)*	(-2.93)***	(-2.57)**	(0.93)	(-2.54)**
?Inf(-1)	3.52144	0.050426	3.47101	3.05818	-1.93714	4.99532
	[33.833]	[1.0517]	[32.169]	[21.289]	[0.1441]	[147.72]
	(1.89)*	(0.05)	(1.65)*	(1.77)*	(-1.74)*	(2.45)**
GDP>T(-1)	1.86371	-0.447610	2.31132	1.61842	0.038071	1.58035
	[6.4476]	[0.6392]	[10.088]	[5.0451]	[1.0395]	[4.8567]
	(1.68)*	(-0.98)	(1.99)**	(1.38)	(0.06)	(1.21)
FB/GDP(-1)	-0.003578	-0.147799	0.144221	0.072903	-0.017556	0.090460
	[0.9964]	[0.8626]	[1.1551]	[1.0756]	[0.9826]	[1.0947]
	(-0.04)	(-4.18)***	(1.43)	(0.62)	(-0.33)	(0.70)
IMFProg	0.981458	-0.509541	1.49100	0.373354	0.802040	-0.428687
	[2.6683]	[0.6008]	[4.4415]	[1.4526]	[2.2301]	[0.6514]
	(1.07)	(-0.96)	(1.45)	(0.39)	(0.98)	(-0.35)
Log Likelihood		-82.9907			-52.8209	
Schwarz B.I.C.		119.341			90.3170	
McFadden R^2		0.2074			0.1712	
No. Observations		180			212	
No. MBS		6			5	
No. ERBS		29			10	

Sources: see tables 1 and 3.

Notes:

- The factor changes in the odds ratios are in brackets;
- *t*-Statistics are in parentheses;
- Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%;
- Models estimated with a constant, by maximum likelihood (ML).
- MBS – Money-Based Stabilization; ERBS – Exchange Rate-Based Stabilization; NS – No Stabilization.

Table 5: Sensitivity analysis

MBS/ERBS	All Programs			Major Programs		
	1	**2**	**3**	**4**	**5**	**6**
PCR	-4.14550 (-3.84)***	-3.24051 (-3.38)***	-3.13453 (-3.28)***	-4.90569 (-3.47)***	-4.48376 (-2.69)***	-3.93434 (-2.85)***
TR/Imp(-1)	-2.41661 (-3.13)***	-1.79134 (-2.64)***	-1.99247 (-2.91)***	-1.68717 (-2.99)***	-1.30768 (-2.36)**	-1.37274 (-2.61)***
?Inf(-1)	4.73152 (1.97)**	2.77173 (1.14)	3.79436 (1.79)*	6.09115 (2.57)**	4.49474 (1.94)*	4.91493 (2.40)**
GDP>T(-1)	3.20057 (2.06)**	2.40630 (2.22)**	2.25114 (1.96)*	2.70756 (1.52)	1.93517 (1.53)	1.76547 (1.36)
FB/GDP(-1)	0.102503 (1.04)	0.074409 (0.86)	0.140347 (1.40)	0.092978 (0.68)	-0.009672 (-0.10)	0.048986 (0.38)
IMFProg	0.959013 (0.96)	0.966203 (0.98)	1.36559 (1.34)	-0.899831 (-0.74)	-1.00092 (-0.82)	-0.621583 (-0.53)
Log Likelihood	-71.5190	-84.5065	-78.1170	-46.3389	-51.8242	-48.9211
Schwarz B.I.C.	106.686	120.857	114.230	82.3306	89.3203	86.0093
McFadden R^2	0.1795	0.2041	0.1927	0.1951	0.1938	0.1826
No. Observations	152	180	174	171	212	200
No. MBS	6	7	6	5	6	5
No. ERBS	22	28	25	9	9	9

Sources: see tables 1 and 3.

Notes:

- *t*-Statistics are in parentheses;
- Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%;
- Models estimated with a constant, by maximum likelihood (ML).
- Only the results of the contrast MBS|ERBS are shown.
- In column 1 and 4 Turkey and Israel are excluded from the sample;
- In columns 2 and 5 the 1985:3 Bolivian program is classified as a MBS;
- In columns 3 and 6 Bolivia is excluded from the sample.
- MBS – Money-Based Stabilization; ERBS – Exchange Rate-Based Stabilization.

Table 6.A: Robustness tests for high inflation periods (all programs) – I

MBS/ERBS	**1**	**2**	**3**	**4**	**5**	**6**	**7**
PCR					-3.17767 (-2.72)***	-3.87670 (-2.76)***	-2.46784 (-3.17)***
QNE	0.069599 (1.03)						
QLE		-0.273915 (-2.01)**					
NQLE			-0.051833 (-3.15)***				
ELY				2.17671 (1.84)*			
Frag					-0.514547 (-0.38)		
Right						3.59861 (2.56)**	
TR/Imp(-1)	-1.91399 (-2.91)***	-1.74224 (-2.97)***	-1.86045 (-3.17)***	-1.84670 (-3.27)***	-2.08861 (-2.78)***	-2.94039 (-2.67)***	
TRdT(-1)							-0.031300 (-1.92)*
?Inf(-1)	3.43723 (1.54)	3.26982 (1.54)	3.24179 (1.57)	3.41887 (1.58)	3.42934 (1.65)*	4.62370 (2.18)**	2.57987 (1.24)
GDP>T(-1)	2.49572 (1.83)*	2.00461 (2.00)**	2.19600 (1.98)**	2.18352 (2.21)**	2.33703 (2.08)**	3.82631 (2.28)**	2.19796 (2.10)**
FB/GDP(-1)	0.089767 (0.91)	0.142040 (1.32)	0.152986 (1.47)	0.138055 (1.21)	0.154745 (1.45)	0.168196 (2.09)**	0.169191 (1.09)
IMFProg	1.46036 (1.58)	1.31210 (1.26)	1.48527 (1.43)	1.35140 (1.36)	1.56753 (1.47)	2.31518 (1.81)*	0.551004 (0.56)
Log Likelihood	-84.6198	-84.7113	-82.7027	-85.1544	-82.5275	-78.9980	-85.0114
Schwarz B.I.C.	120.970	121.062	119.053	121.505	124.071	120.542	121.362
McFadden R^2	0.1918	0.1909	0.2101	0.1867	0.2118	0.2455	0.1881
No. Observ.	180	180	180	180	180	180	180
No. MBS	6	6	6	6	6	6	6
No. ERBS	29	29	29	29	29	29	29

Sources: see tables 1 and 3.

Notes:

- *t*-Statistics are in parentheses;
- Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%;
- Models estimated with a constant, by maximum likelihood (ML).
- Only the results of the contrast MBS|ERBS are shown.
- MBS – Money-Based Stabilization; ERBS – Exchange Rate-Based Stabilization.

Table 6.B: Robustness tests for high inflation periods (all programs) – II

MBS/ERBS	8	9	10	11	12	13	14
PCR	-2.05792 (-2.51)**	-3.32247 (-3.08)***	-3.09802 (-3.09)***	-2.95710 (-3.09)***	-2.98301 (-2.97)***	-3.44692 (-3.11)***	-3.20024 (-3.32)***
TR/Imp(-1)	-1.96241 (-2.33)**	-1.82436 (-3.37)***	-1.99548 (-3.45)***	-1.62322 (-1.73)*	-1.86752 (-2.25)**	-2.09743 (-2.96)***	-2.12537 (-3.01)***
?Inf(-1)		3.72192 (1.74)*	4.33271 (2.09)**	2.99194 (1.32)	3.43238 (1.52)	3.69047 (1.81)*	4.15485 (1.94)*
Inf(-1)	0.000660 (1.44)						
GDP>T(-1)	1.16539 (1.24)			2.12896 (1.75)*	2.16873 (1.79)*	2.34827 (2.26)**	2.20793 (1.77)*
GDP(-1)		0.181513 (1.92)*					
GDPdT(-1)			0.222210 (2.03)**				
FB/GDP(-1)	0.218750 (1.30)	0.152339 (1.23)	0.140928 (1.08)	0.166804 (1.52)	0.142085 (1.48)	0.167080 (1.51)	0.159237 (1.25)
IMFProg	1.74086 (1.71)*	1.66591 (1.60)	1.83074 (1.77)*			1.81908 (1.57)	1.80409 (1.63)
TFC/Imp(-1)				-0.738711 (-0.73)			
Dur_aid					0.139433 (0.74)		
Open(-1)						3.30068 (0.85)	
RER(-1)							0.008429 (1.01)
Log Likelihood	-82.0301	-83.7829	-82.9598	-78.4196	-83.3435	-82.2835	-82.0839
Schwarz B.I.C.	118.381	120.134	119.311	114.770	119.694	123.827	123.628
McFadden R^2	0.2166	0.1998	0.2077	0.2510	0.2040	0.2141	0.2160
No. Observ.	180	180	180	180	180	180	180
No. MBS	6	6	6	6	6	6	6
No. ERBS	29	29	29	29	29	29	29

Sources: see tables 1 and 3.

Notes:

- *t*-Statistics are in parentheses;
- Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%;
- Models estimated with a constant, by maximum likelihood (ML).
- Only the results of the contrast MBS|ERBS are shown.
- MBS – Money-Based Stabilization; ERBS – Exchange Rate-Based Stabilization.

Table 7: Robustness tests for all observations and programs

MBS/ERBS	1	2	3	4	5
PCR	-3.49019 (-2.62)***				
QNE		0.100731 (1.50)			
QLE			-0.317435 (-2.03)**		
NQLE				-0.062897 (-3.10)***	
ELY					2.09322 (1.88)*
TR/Imp(-1)	-1.51742 (-1.24)	-1.41489 (-1.20)	-1.45524 (-1.27)	-1.46925 (-1.29)	-1.42986 (-1.28)
?Inf(-1)	-0.000751 (-0.002)	0.132032 (0.30)	0.049287 (0.11)	0.067715 (0.16)	0.018109 (0.04)
GDP>T(-1)	0.854778 (0.81)	1.05046 (0.94)	0.796762 (0.75)	0.798765 (0.75)	0.843321 (0.81)
FB/GDP(-1)	0.095954 (0.99)	0.068093 (0.71)	0.096745 (1.03)	0.099820 (1.04)	0.094561 (1.02)
IMFProg	0.587201 (0.55)	0.400270 (0.36)	0.582996 (0.54)	0.629837 (0.59)	0.527078 (0.50)
Log Likelihood	-140.631	-141.040	-142.270	-140.117	-143.077
Schwarz B.I.C.	188.786	189.195	190.425	188.272	191.233
McFadden R^2	0.1566	0.1541	0.1467	0.1597	0.1419
No. Observ.	972	972	972	972	972
No. MBS	6	6	6	6	6
No. ERBS	29	29	29	29	29

Sources: see tables 1 and 3.

Notes:

- *t*-Statistics are in parentheses;
- Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%;
- Models estimated with a constant, by maximum likelihood (ML).
- Only the results of the contrast MBS|ERBS are shown.
- MBS – Money-Based Stabilization; ERBS – Exchange Rate-Based Stabilization.