The Impact of Conflicts of Interest on Inflation Stabilization[*]

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Abstract

This paper tries to explain why high inflation levels persist during long periods of time, in several countries affected by chronic inflation, without the necessary corrective measures being implemented. Political models of conflict explain these delays as the result of coordination problems caused by collective choice-making mechanisms. The empirical results of a tobit model estimated over a panel of 10 countries affected by chronic inflation and covering 43 years of observations show that more fragmented political systems and those with a large number of parties represented in the parliament present greater delays of inflation stabilizations. Since higher fragmentation foments conflicts of interest, I conclude that such conflicts are one of the main causes of those delays in chronic inflation countries.

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1. Introduction

In the last decades several countries affected by chronic inflation have followed non-optimal and unsustainable policies for long periods of time. These policies caused economic disequilibria and led to high public deficits and untenable debts. The use of seigniorage revenues to finance the public deficits aggravated the disequilibria and generated extremely high inflation levels. Although these policies were recognized as sub-optimal from a social standpoint, the necessary deficit and inflation stabilization programs were often delayed. This generated persistent and high inflation levels in those countries during long periods of time. Thus, a question arises: Why were those high inflation levels maintained during so long without the necessary stabilization measures being implemented? This is the main question I will try to answer in this paper.

Many authors try to explain the delays in reforms by accusing politicians of myopia or irrational behavior, or arguing that countries do not have the ability or the technical competence necessary to carry out the reforms. Others argue that the delays are the rational and deliberate choice of a policymaker that tries to maximize a social welfare function. These explanations are not convincing. More appealing explanations are given by the political models of conflict, which assume that policy choices result from negotiations between competing interest groups, and explain the delays by coordination problems caused by collective choice-making mechanisms.

Looking only at this literature, I hypothesize that the answer to the question previously formulated could be in the conflicts between competing interest groups. As conflicts of interest are inherent to more fragmented political systems, in which it is more difficult to achieve the necessary consensus to implement the required measures, I conjecture that in those political systems the delays of inflation stabilization will be

longer. This is the main hypothesis to test in this paper. Nonetheless, other hypotheses will be formulated according with this literature, and tested in order to identify the main (political and economic) causes of the delays of inflation stabilization. To do so, I estimate a tobit model for a panel of 10 countries affected by chronic inflation, covering 43 years of observations (1957-1999).

Several other studies have already analyzed the effects of political fragmentation and instability on seigniorage, budget deficits, debt, inflation, and on the probability of starting an inflation stabilization program. Nevertheless, no other study tests the influence of the political fragmentation on the delay of inflation stabilization as directly as this. The option for the tobit model allows the use of the delay as the dependent variable and, in this way, I can directly test the impact of several political and economic factors on the delay of inflation stabilization.

The paper is organized as follows. Section 2 presents some evidence on the delays of inflation stabilization. Section 3 describes some theoretical explanations for the delays of reforms. The data, the econometric model, and the assumptions to test are presented in section 4. The empirical results are analyzed in section 5. The last section summarizes the main conclusions.

2. Delays of inflation stabilizations

Before the World War I episodes of high inflation were rare, which in accordance with Végh (1992) was the reflex of the prevalence of convertible currencies and commodities monies. However, in the aftermath of World War I hyperinflation[1]

[1] Hyperinflation corresponds to a monthly inflation rate of at least 50% and tends to have a short duration, sometimes of just a few months.

began to affect some European countries: Austria, Germany, Hungry, and Poland.[2] The speed by which the inflationary process was eliminated was one of the characteristics of the reforms implemented by these countries.

After World War II, when hyperinflation had already achieved notoriety, a new phenomenon began to emerge: chronic inflation.[3] Some countries, particularly in Latin America, began to endure high (relative to industrial countries) and persistent rates of inflation, which in some cases have lasted up to the last decade. In Table 1 (column 1) the main countries that were affected by this phenomenon are identified. I also include in this group Israel and Turkey (non-Latin America countries), because they also suffered from chronic inflation.

<Insert Table 1 around here>

Today, it is commonly accepted that high inflation levels registered in these countries are intimately related to the use of non-optimal and unsustainable policies, like monetizing the public deficit. Bruno (1993) also argues that high inflation levels are the result of internal political and economic crises, failure in response to external shocks, and growing debt. Bernholz (1995) sees this phenomenon as a result of the electoral game in which policymakers try to benefit some groups in order to obtain political support. Heymann and Leijonhufvud (1995) synthesize these ideas concluding that the political factors that influence the policymakers' behavior lead to budget deficits, which induce the money creation, causing a higher growth of prices and, consequently, a higher inflation.

[2] For a complete study of this reality see Sargent (1982).

[3] In literature, chronic inflation is commonly defined as a high inflation relative to that of industrial countries and that lasts for a long period of time (for several years).

High inflation must be eliminated because it involves high costs and generates inefficiencies in the allocation of resources. In this way, it is convenient to take some measures in order to diminish it. Indeed, several stabilization programs were implemented in the countries previously pointed out in order to reduce inflation to stable levels (see Table 1, column 2). These stabilization programs were essentially of two kinds (see Table 1, column 3): money-based stabilization programs (MBS); and exchange rate-based stabilization programs (ERBS).[4]

Before proceeding, I would like to notice that the kind and dates of implementation of the stabilization programs presented in Table 1 were collected from the literature related with inflation stabilizations.[5] Nevertheless, I only collected those programs that constituted true and credible attempts of inflation stabilization because those are the ones that constitute the most relevant chronic inflation stabilizations and the ones that received greatest attention in the economics literature.[6] Although I have followed an episodic approach in searching for stabilization attempts some authors use a mechanical approach[7] identifying the stabilizations in accordance with a mathematical rule for inflation behavior. The mechanical approach is more flexible, permitting the inclusion of more countries and programs (not referred in the literature) in the sample,

[4] MBS aims to stabilize inflation and the deficit using a target for money growth as the nominal anchor, while exchange rate is used to maintain external equilibrium. ERBS combine the fight to inflation and the budget deficit adjustment with a target for the exchange rate, without any specific preoccupation with the growth of the money supply.

[5] See last column of Table 1.

[6] Other programs were implemented, but they did not represent credible attempts of inflation stabilization, so I did not include them in this study. For a more complete description of all inflation stabilization programs implemented in the countries presented in Table 1, see Castro and Veiga (forthcoming).

[7] See, for instance, Easterly (1996) and Hamann (1999).

but it tends to bias the sample to well succeeded programs, including some programs that did not exist, ignoring failed stabilization attempts. Because of these problems, I chose the episodic approach.

As already stated, and contrarily to the hyperinflations registered in the 1920s, which were quickly eliminated with low costs for output, chronic inflation that affected several Latin America countries since the 1960s took much longer to be eliminated. Looking at Table 1 (column 4) the persistence of "high" inflation is evident.[8] In some cases it lasts for several years.[9] Numerous were the attempts to stabilize inflation but, despite their relative success, they were rarely implemented on the right time, that is, when they began to be necessary, or when inflation started to reach high levels. And, sometimes no concrete program seems to be implemented (see Table 1). Consequently, inflation was reaching higher and persistent levels without the necessary stabilization measures being adopted. Therefore, a question arises: Why did inflation persist high for so long without the necessary and adequate stabilization measures being implemented? Or alternatively: Why was there such a long delay in the implementation of credible inflation stabilization programs?

This is the main question that I will try to answer in the empirical work. But, previously, I will present some theoretical justifications appointed in the literature for the delay in the implementation of efficient reforms.

[8] Following Veiga (2000), "High" inflation is defined as twice the average inflation rate of the last 10 years (and superior to 25%) or greater than or equal to 100%.

[9] Bruno (1993) sustains that the relative stability of the inflationary process was the result of the high degree of monetary accommodation of the nominal variables to the lagged changes in the price level.

3. Theoretical explanations for the delays of reforms

In the literature there are basically three alternative collections of explanations for the delay of economically efficient reforms.[10] These reforms might improve the aggregate welfare but, as previously noticed, they are not always implemented with the necessary speed.

The first explanation assumes myopia or irrationality of policy-makers. Some countries postpone the necessary reforms because they do not perceive that these are unavoidable. This argument is unconvincing: many times the evidence for the necessity of a reform is incontestable. Several authors also believe that some countries do not possess the necessary expertise to put the reforms into practice, so they wait that things get better by themselves or that a greater crisis forces them to act. Nevertheless, this argument is criticizable because it is not rational, once the more a country waits, the more painful the reform becomes.

The second explanation is based on an optimal control framework and assumes that delays are rational and a deliberate choice of a policy-maker maximizing a social welfare function. In these models delay is optimal if the costs of living under inflation are smaller than the costs of implementing a successful stabilization program. Nevertheless, this approach does not explain why some countries do not stabilize when there are good conditions for doing so and why several other stabilizations are implemented without the optimal conditions.

Finally, political models of conflict assume that policy choices result from negotiations between contending interest groups, and explain deviations from optimality (delays) by coordination problems caused by the mechanisms of making collective

[10] For a complete survey, see for instance, Alesina (1994), Drazen (1996, 2000), and Rodrik (1993, 1996). This division of the explanations for delays in three groups follows Veiga (2000).

choices. Effectively, this explanation makes more sense. Presenting a more consistent theoretical explanation for the postponement of efficient reforms, political models of conflict achieve a particular importance.

Some references related with these approaches are presented below. Although most of this literature deals with the fiscal stabilization (stabilization in the budget deficit or in the ratio of public debt to GDP), their conclusions are also applicable to inflation stabilization, since one must accompany the other.

3.1 Distributional conflict

Alesina and Drazen (1991) present a model in which delays of fiscal stabilization result from the failure of rival interest groups to agree on a deficit reduction program. Indeed, each group attempts to shift the burden of stabilization onto other groups. This situation leads to a "war of attrition" in which agreement on a stabilization program is only reached when one of the groups concedes, that is, accepts paying a higher proportion of the taxes in order to eliminate the deficit. Concession happens only when the marginal benefit of waiting equals the marginal benefit of conceding. In this model, one important factor leading to delays is the degree of political polarization and fragmentation among interest groups.

Drazen and Grilli (1993) extend the model of Alesina and Drazen (1991) emphasizing the possible benefits of economic crises. They argue that crises and emergency situations can force the adoption of stabilization programs. In fact, an exogenous shock that aggravates the economic conditions (higher costs of delaying) may be welfare improving, in the sense that reveals the loser faster conducing to an earlier agreement to stabilize. Consequently, higher costs resulting from higher inflation

may hasten stabilization, as long as measures are not used to fade the reduction caused in welfare by these costs.[11]

Labán and Sturzenegger (1994a, 1994b) build a model in which class conflicts between the rich and the poor and adjustment costs lead to delays of stabilization in the context of the Latin American debt crisis. They assume that the rich protect their income from inflation tax using a financial adaptation technology (capital flight), which is not available to the poor. As capital flight increases, the base for distortionary taxes diminishes and inflation has to increase in order to generate enough receipts to finance the deficit, leading to higher welfare costs to the poor. As their relative situation gets worse they will accept to support a disproportionate share of the adjustment costs and an agreement to stabilize will be reached. The authors conclude that factors like higher costs of stabilization, lower costs of inflation, and lower costs of financial adaptation may increase the delays.

Casella and Eichengreen (1996) introduce in the model of Alesina and Drazen (1991) the analysis of the impact of foreign aid on the timing of stabilizations. They conclude that only aid that is decided upon and delivered soon enough could clearly increase welfare in the receiving country. This conclusion confers a character of ambiguity to foreign aid, which is also sustained by Rodrik (1996). He argues that it can hasten stabilization by reducing its costs, but the prospect of aid can also lead contending groups to postpone necessary sacrifices until it arrives, leading to a delay of stabilization. Because of this last possibility, Bruno and Easterly (1996) argue that an extra-incentive to stabilize might be a cut of foreign aid to high inflation countries.

[11] Notice that, the use of wage and prices indexation mechanisms may fade the welfare loss caused by higher inflation and, in this way, may postpone stabilization.

Finally, Hsieh (2000) considers the delays as the outcome of a bargaining game between two parties and, like Alesina and Drazen (1991), concludes that a settlement is only reached when the benefit from delay is smaller than the cost of continued inefficient policies. He also notes that a crisis that increases the welfare loss from not stabilizing and a cut in foreign aid will lower the delay.

3.2 Political instability

Alesina and Tabellini (1989) developed a model in which political instability and polarization lead to over-accumulation of external debt, capital flight, low domestic investment, and, consequently, may also lead to delays in reforms. Although not directly related to stabilizations, their model shows how inefficient outcomes (delays of efficient reforms, for instance) can be caused by political instability and polarization.

Roubini and Sachs (1989) present evidence for several OECD countries that higher fragmented political systems lead to higher public debts.[12] They found that countries with a large number of parties represented in Parliament, in which one-party overall majority is difficult to obtain, tend to present higher debts. As minority governments do not possess the necessary political stability, cohesion and support, agreements are harder to obtain and stabilizations are delayed. In sum, they conclude that multiparty systems with coalition governments may have more difficulties in achieving a quick agreement to stabilize.

Cukierman, Edwards and Tabellini (1992) and Roubini (1991) prove that an increase in the degree of political instability, generally associated with frequent changes

[12] Using data for several Latin American countries, Veiga (2000) shows empirically that a higher fragmentation of the political system conducts to a lower propensity to implement an inflation stabilization program. He also finds that a higher inflation hastens the implementation of a program.

of government, tends to lead to a higher use of seigniorage and to higher budget deficits.[13] Therefore, political instability may have an important role in explaining inflation gaps between countries.

Haggard and Kaufman (1992) add that governments in less fragmented political systems, such as authoritarian regimes, are less exposed to political pressures and may quickly build the necessary consensus for the reform. Thus, they sustain that authoritarian regimes might be more successful in initiating reforms than democratic ones.[14] In opposition, Ball and Rausser (1995) argue that political repression might not be the best way to implement sustainable economic reforms.

3.3 Uncertainty related to the stabilization results

Fernandez e Rodrik (1991) also try to find out why governments failed in adopting policies able to promote efficiency. Their answer rests on the uncertainty related to the distribution of gains and loses generated by the reform. They conclude that a reform that would benefit a majority of the population may be rejected, by a majority of the electorate, if there is uncertainty about the agents that will benefit from it. This may also happen with an inflation stabilization program.

Orphanides (1996a, 1996b) analyses the delay and abandonment of a stabilization program as optimal decisions by a policymaker. He argues that may be better to delay the program if more favorable initial conditions are expected. In this

[13] Cukierman, Edwards and Tabellini (1992) sustain that more unstable political systems tend to rely more on seigniorage and they also refer that the necessary reform is generally delayed when the incumbent government faces a small probability of reelection and high polarization.

[14] Haggard and Webb (1993) find that the theoretical support for this claim rests on crucial assumptions about the nature of authoritarian leadership and that the empirical evidence for the advantages of authoritarianism is inconclusive.

way, the author tries to explain the delays not recurring to the political impasse but assuming the rationality of the government. He considers foreign reserves as a determinant factor to the success of a stabilization: low levels of foreign reserves will probably result in delayed or abandoned stabilization programs.

4. The data and the econometric model

Based on the theoretical approaches presented above, I will proceed with an empirical analysis in order to point out the main causes of the delays in inflation stabilization verified in some countries affected by chronic inflation.

For that propose I constructed a dataset composed of quarterly data from 1957 to 1999, for 10 countries that experienced chronic inflation and implemented stabilization programs during this period.[15] In order to determine when a stabilization program has been implemented, I searched the economics literature for information on the starting dates of stabilization programs in those countries. The 24 major stabilizations identified are described in Table 1. The other 8 "high" inflation periods, also identified in Table 1, and that ended without the implementation of a concrete inflation stabilization program, were obtained through the definition of "high" inflation used.[16]

The dependent variable was constructed based on the duration of "high" inflation until its stabilization. I define the independent variable as the delay of inflation stabilization (*Delay*), which is measured by the duration of inflation (in consecutive quarters) since the first quarter in which it is considered "high", that is, since stabilization measures are considered necessary, until a stabilization program has started

[15] I thank Francisco Veiga for sharing his dataset.

[16] As indicated above, and following Veiga (2000), inflation is considered "high" when it is over twice the average inflation rate of the last 10 years (and superior to 25%) or greater than or equal to 100%.

or inflation ceased to be "high". This variable increases one unit by each quarter of "high" inflation until stabilization.[17] When inflation is not "high", the dependent variable takes the value 0.

A description of the dependent and independent variables used in this work is presented in Table 2, where I also define the political and economic variables and the sources where I obtained them.

<Insert Table 2 around here>

The data reveals that the dependent variable (*Delay*) takes the value 0 several times, which means that there is no delay (or inflation is not considered high). However, when it is necessary to implement a stabilization program (because inflation is high), the dependent variable is positive and presents some variation. Since there are several observations equal to 0, I opted to estimate a tobit model, censoring the dependent variable for all observations equal to 0.[18] Using this method it is possible to centralize the analysis directly on the effective delay of inflation stabilizations.

The general formulation for the tobit[19] model is usually given in terms of an index function, which may be formalized as follows:

(1) $$Y_i^* = X_i'\beta + \varepsilon_i ,$$

[17] When the duration of "high" inflation until the quarter before the stabilization is 0, I consider that the dependent variable takes the value 1 when the program is implemented. If the government considers necessary the implementation of a stabilization program in a given quarter, that is because inflation is higher than it desires. Thus, I opted to consider the smaller possible value for *delay* (1 quarter).

[18] As there are several observations equal to 0 for the dependent variable, ordinary least squares gives biased and inconsistent estimates for the coefficients associated to the independent variables (see Greene, 2000, p. 912). In order to avoid this problem it is used a tobit model.

[19] For a description of the model see, for instance, Breen (1996), Greene (2000), Long (1997), and Maddala (1983).

where ε_i is assumed to be $NID(0,\sigma^2)$ and independent of X_i. The index variable, also called the latent variable, is only observed for positive values and censored for values equal to 0, but the independent variables (X_i) are observed in all cases. So, the variable that is observed (Y_i), and that represents the *Delay*, is defined as follows:

$$(2) \qquad Y_i = \begin{cases} Y_i^* = X_i'\beta + \varepsilon_i & if \quad Y_i^* > 0 \\ 0 & if \quad Y_i^* \le 0. \end{cases}$$

This model describes two situations: one is the probability that $Y_i = 0$ (given X_i); and the other is the distribution of Y_i given that it is positive. Therefore, the expected value of Y_i (given X_i) is given by:

$$(3) \qquad \begin{aligned} E(Y_i \mid X_i) &= \text{Prob}(Y_i = 0) * E(Y_i \mid Y_i = 0) + \text{Prob}(Y_i > 0) * E(Y_i \mid Y_i > 0) = \\ &= X_i'\beta\Phi(X_i'\beta/\sigma) + \sigma\phi(X_i'\beta/\sigma), \end{aligned}$$

in which σ represents the standard error of the disturbance term, and $\Phi(.)$ and $\phi(.)$ represent, respectively, the normal cumulative distribution function and the normal density function.

From (3) it follows that the marginal effect on the expected value of Y_i of a change in X_{ik} is given by:

$$(4) \qquad \frac{\partial E(Y_i \mid X_i)}{\partial X_{ik}} = \beta_k \Phi(X_i'\beta/\sigma).$$

This means that the marginal effect of a change in X_{ik} upon the expected outcome Y_i is given by the coefficient of the model multiplied by the probability of having a positive

outcome.[20] Notice that if this probability is one, the marginal effect is simply β_k, as in the linear model estimated by the ordinary least squares method.

The estimation of the tobit model is done trough maximum likelihood. The contribution to the likelihood function of an observation either equals the probability mass (at the observed point $Y_i = 0$) or the conditional density of Y_i, given that it is positive, times the probability mass of observing $Y_i > 0$. Thus the log-likelihood can be written as:

$$\log L(\beta, \sigma^2) = \sum_{Y_i=0} \log\left[1 - \Phi\left(\frac{X_i'\beta}{\sigma}\right)\right] + \sum_{Y_i>0} \log\left[\frac{1}{\sqrt{2\pi\sigma^2}} \exp\left\{-\frac{1}{2}\left(\frac{(Y_i - X_i'\beta)^2}{\sigma^2}\right)\right\}\right]. \quad (5)$$

Maximization of (5) with respect to β and σ^2 yields the maximum likelihood estimates. Assuming that the model is correctly specified, this gives consistent and asymptotic estimators for both β and σ^2.

This estimation method is different from that used by Veiga (2000), who estimated the probability of starting an inflation stabilization program in a situation of high inflation. Veiga (2000) searches explanations for the delays of stabilizations analyzing the timing of the implementation of an inflation stabilization program. My work relies directly on the delay and not on the timing of a stabilization program. Thus, the method I use allows ofr a more diret study of the causes of these delays. By using this alternative method of estimation I also intend to verify the main conclusions obtained by Veiga (2000).

[20] Greene (2000, p. 911) and Breen (1996, p. 32) present the ratio between the number of no censored observations and the total number of observations as a consistent estimate for that probability, that is for $\Phi(X_i'\beta/\sigma)$.

Once presented the data and the econometric model, and before describing the empirical results, I advance with some assumptions about the possible impact of the various independent variables on the dependent variable based on the literature presented above.

In order to measure the impact of the conflicts of interest on the *Delay*, I use the two proxies suggested by Veiga (2000): the degree of fragmentation of the political system (*FPS*);[21] and the fragmentation index of the distribution of seats in the lower house of the parliament (*FIP*).[22] According to Alesina and Drazen (1991), Alesina and Tabellini (1989), Cukierman, Edwards and Tabellini (1992), Roubini and Sachs (1989) and Veiga (2000), a more fragmented political system, which has inherent deep conflicts of interest, may lead to a higher delay of inflation stabilization, once that in such conditions it is not easy to achieve an agreement to stabilize. Thus, I expect that the dummy variables used to capture the effect of the degree of fragmentation of the political system (*FSP1* and *FPS2*) have negative coefficients, and that *FIP* presents a positive coefficient. I also expect that the coefficient for *FPS1* is greater, in absolute value, than the coefficient for *FPS2*, which means that authoritarian regimes where political parties are not permitted may present smaller delays in inflation stabilization, which is in agreement with the study of Haggard and Kaufman (1992).

Hibbs (1977) sustains that right-wing oriented governments are relatively more concerned with inflation than left-wing oriented ones. This makes me believe that the

[21] Three degrees of political fragmentation are identified. These are indicated in Table 2 as dummy variables: the first two (*FPS1* and *FPS2*) will be included in the regression model; the third, which refers to more fragmented political systems (*FPS3*), will be used as the base category, so it will not be included in any regression.

[22] The higher this index is, the greater is the effective number of parties represented in the parliament, and the higher will be its fragmentation.

variable *Orient* (which takes the value of one for a right-wing oriented government, and zero otherwise) may present a negative coefficient, hoping that a rightist government will be faster to fight high inflation than a leftist one.

Following the works of Alesina and Tabellini (1989), Cukierman, Edwards and Tabellini (1992), and Roubini (1991) it is possible to infer that delays of inflation stabilization may also be caused by political instability, generally related with short permanence of governments in power or frequent changes of government. In order to capture this effect I use the variables: *QLChG* (number of quarters since the last change in government or election), *NGCh5* (number of changes in government or elections that occurred in the last five years), and *ChLY* (which takes the value of one when a change in government or election occurred in the last year, and zero otherwise). As a higher political instability may cause delays of inflation stabilization, I expect a negative signal for the coefficient associated to *QLChG*, and a positive one for *NGCh5* and *ChLY*.

Assuming that a higher inflation brings more costs, I hypothesize, based on the models of Drazen and Grilli (1989) and Laban and Sturzenegger (1994a, 1994b) and on the empirical results of Veiga (2000), that a higher inflation (*Inf*) or a higher acceleration of the inflation rate (*ΔInf*) diminish delays. Therefore, I anticipate a negative signal for the coefficients associated to the variables *Inf* and *ΔInf*.

According to Orphanides (1996a, 1996b) low levels of foreign reserves will probably lead to delays or abandonment of stabilization programs. Consequently, I expect a negative coefficient for the ratio of total reserves to imports (*TR/Imp*).

Realizing the ambiguous effect of external aid on stabilization, as referred by Casella and Eichengreen (1996) and Rodrik (1996), I decided, following Bruno and Easterly (1996), to assume that external aid may delay a stabilization, since it generally takes time until aid becomes available, and contending groups may postpone the

necessary sacrifices until it arrives. Consequently, this assumption implies positive coefficients for the variables *TFC/Imp*, *Dur_aid*, and *IMFProg*.

The growth of real GDP (*GDP*), the fiscal balance as a percentage of GDP (*FB/GDP*), and the oil price index (*OPI*) are not directly related with the models referred to above. But, it is possible that they affect the delay of inflation stabilization. For this reason, they will be included in the estimations as control variables.

5. Empirical results

Table 3 presents the results of the tobit estimations.[23] Since tobit coefficients are not very intuitive, the marginal effects of the independent variables on the observed dependent variable, *Delay*, are reported. The marginal effects give the impact of one-unit change in the regressors on the *Delay* for the mean probability of having a delay in inflation stabilization. *t*-Statistics for the null or no effect and the significance level at which the null hypotheses are rejected are also reported. Most economic variables are lagged one period in order to avoid simultaneity problems and to account for the usual delays in reporting of economic data. Finally, the logarithm of the likelihood function, the Schwartz Bayesian Information Criterion (Schwartz B.I.C.), the McFadden R^2, the number of observations and the number of positive observations are reported.

<Insert Table 3 around here>

Country and time dummies were included in all estimations.[24] They were statistically significant individually and jointly. I also used robust standard errors,

[23] The econometric Package TSP 4.5 was used to estimate the regressions.

[24] Ten country dummies were created, one for each country, and 9 of them were included in the regressions. Four time dummies were also created, one for the 1960s (including the late 1950s), another for the 1970s, another for the 1980s and, finally, for the 1990s, and 3 of them were included in the regressions.

calculated trough the Eicker-White method, in order to control for heteroscedasticity and for some other forms of misspecification in maximum likelihood estimation.

Results support the main assumption of this work that a higher fragmentation of the political system (which has inherent deeper conflicts of interest) leads to a higher delay of inflation stabilization. *FPS1* and *FPS2* are always statistically significant and the estimated coefficients have the expected signs.[25] Furthermore, the estimated coefficient of *FPS1* is always greater, in absolute value, than that of *FPS2*, which means that authoritarian regimes that do not allow political parties present smaller delays in inflation stabilization. The estimated coefficient for *FIP*[26] also has the expected sign and is significant, providing evidence that more parties in the parliament lead to delays of stabilizations.[27] All these results are in accordance with the works of Alesina and Drazen (1991), Alesina and Tabellini (1989), Cukierman, Edwards and Tabellini (1992), Roubini and Sachs (1989), Haggard and Kaufman (1992) and confirm the empirical results obtained by Veiga (2000) for the analysis of the probability of starting a stabilization program in a situation of high inflation.

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[25] Notice, for instance in column 1, that the passage from a more fragmented political system to a one-party majority parliamentary government or a presidential government, with the same party in control of the parliament (with an overall majority), leads to a decrease in the *Delay* of about 1.1 quarters, *ceteris paribus*. As *FPS2* is a dummy variable, a more precise procedure to calculate its marginal impact would be: $[\Delta E(Y|X)/\Delta x_k] = E(Y|X, x_k=1) - E(Y|X, x_k=0)$, with $E(Y|X)=\Phi(\delta)X'\beta + \sigma\phi(\delta)$, in which $\delta=X'\beta/\sigma$ (see Long, 1997, pp. 209-210). However, as the results are not very different, this procedure is not relevant for the conclusions of this study.

[26] This variable was never included in the estimations with *FPS1* and *FPS2* because there is a high correlation between these variables, which could lead to problems of multicollinearity.

[27] A one-unit increase in this index leads to an increase in the *Delay* of about 0.18 quarters (more or less 16 days), *ceteris paribus*.

Orient is statistically significant but its coefficient does not have the expected sign. Thus, the partisan theory of Hibbs (1977) is not confirmed here. This fact is not strange at all, since sometimes substantial policy changes are implemented by parties with less reputation to implement such policies, as Cukierman and Tommasi (1998) argue. Based in this argument, it is possible that left-wing oriented governments stabilize high inflation faster, as my results indicate.

The variables introduced to capture specifically the effect of political instability on the delay (*QLChG*, *NGCh5*, and *ChLY*) are all statistically significant and their coefficients present the expected signs. Therefore, higher political instability (short permanence of governments in power or frequent changes of government) induces the postponement of inflation stabilizations, which is in accordance with the works of Alesina and Tabellini (1989), Cukierman, Edwards and Tabellini (1992), and Roubini (1991).

Considering that inflation growth lagged one period (*ΔInf(-1)*) might affect the delay to a greater extend than its level (*Inf(-1)*), due to the accommodation mechanisms used by the countries included in the sample to protect them against inflation costs, I opted toy include this variable in almost all regressions. However, it is never statistically significant. The same happens with *Inf(-1)* (see Table 3, column 5). This shows that neither the inflation level nor its growth affects the delay of inflation stabilization, which contradicts the ideas of Drazen and Grilli (1993) and the results of Veiga (2000). A possible justification for these results can be related with the indexation schemes and financial adaptation.[28] Végh (1992) observes that chronic-inflation countries learn to live with high inflation by adopting various indexation

[28] These results may also be due to the definition of the dependent variable and its relation with the inflation variable.

mechanisms, which reduces the inflation costs and, consequently, the incentives to eradicate high inflation. Therefore, as the costs of high inflation are not completely revealed, due to those mechanisms, it is possible that neither the inflation level nor its growth present any impact on the delay of inflation stabilization.[29] But when they are revealed, normally a stabilization program is implemented. So, it is possible that inflation has a positive effect on the probability of starting a stabilization program, as shown by Veiga (2000), but no effect on its delay.

Tr/Imp(-1) has the wrong sign and is never statistically significant, providing no support for the Orphanides (1996a, 1996b) hypothesis that a low level of foreign reserves leads to delays of stabilization programs.

TFC/Imp(-1) has the expected sign but is only statistically significant in the regression presented in column 2. Contrarily, *Dur_aid* is always statistically significant but its sign is contrary to the expected. This result could give some margin to argue that the persistence of the aid might help to reduce the delays, but that is not consistent with the results of the variables *TFC/Imp(-1)* and *IMFProg* (column 6). So, the impact of the external aid on delay is not clear.

The control variables (*GDP(-1)*, *FB/GDP(-1)*, *OPI*) are always statistically significant. They show that the lower the growth of real *GDP* lagged one period, the higher the budget deficit as a percentage of *GDP* lagged one period, and the higher the oil price, the higher will be the delay of inflation stabilization.

In order to verify the consistence of the results presented below, I perform a sensitivity analysis using the same specifications of columns 1 and 2 of Table 3. The results of this analysis are presented in Table 4.

[29] Note that Drazen and Grilli (1993) also sustain that the inflation costs may hasten a stabilization only if no measures have been undertaken to reduce the costs associated with high inflation.

<Insert Table 4 around here>

In the regressions presented in columns 1 and 2 of Table 4, an alternative definition of high inflation is used: inflation is considered "high" if it is over twice the average inflation rate of the last 5 years (and superior to 25%) or greater than or equal to 100%. In columns 3 and 4 Turkey and Israel are excluded from the sample, so that one could verify if the conclusions are the same when only Latin American countries are included. And, finally, in columns 5 and 6 all observations before 1970 are excluded, in order to verify if the results are maintained when one only considers the period in which the problems with chronic inflation became more severe. In all these cases, results are not significantly different from the ones presented in Table 3, which confirms the conclusions obtained there.

Besides using of robust covariances to control for heteroscedasticity, the sensitivity of the tobit model to this problem induced me to estimate an heteroscedastic tobit model. In the general linear model, OLS estimates are consistent but not efficient when the disturbances are heteroscedastic. In the case of the limited dependent variable models, Maddala and Nelson (1975) showed that if one ignores heteroscedasticity, the resulting estimates are not even consistent. Considering this fact and the sensitivity of the tobit model to the heteroscedasticity, I decide to control for this problem more carefully.

According to Maddala (1983), the solution for the heteroscedasticity problem consists on making some reasonable assumptions about the nature of the heteroscedasticity. A possible specification can be the following:

(6) $$\sigma_i^2 = (\gamma + \delta Z_i)^2,$$

in which γ and δ are parameters to be estimated and Z_i may include some or all of the variables in X_i. A test for heteroscedasticity reduces to a test for $\delta = 0$, which can be the likelihood-ratio test or the Wald test. The log-likelihood function is given by:

$$\log L(\beta,\gamma,\delta) = \sum_{Y_i=0} \log\left[1 - \Phi\left(\frac{X_i'\beta}{\gamma + \delta Z_i}\right)\right] + \sum_{Y_i>0} \log\left[\frac{1}{\sqrt{2\pi(\gamma+\delta Z_i)^2}} \exp\left\{-\frac{1}{2}\left(\frac{(Y_i - X_i'\beta)^2}{(\gamma+\delta Z_i)^2}\right)\right\}\right]. \quad (7)$$

This function is estimated by maximum likelihood for β, γ, and δ.

The estimations for the heteroscedastic tobit are presented in Table 5,[30] which presents two regressions using the same independent variables of Table 3, columns 1 and 2. The variance function uses the variables which were statistically significant when included individually or jointly: *Orient*, *QLChG*, and *FB/GDP(-1)*.[31]

<Insert Table 5 around here>

Results are still showing that the delay is greatly caused by political fragmentation, and that authoritarian regimes are more prone to hasten an inflation stabilization. The variables *ΔInf(-1)* and *Tr/Imp(-1)* are not statistically significant, and the impact of the external aid on delay is not clear, confirming previous results. Furthermore, the control variables confirm the results presented in Table 3, columns 1 and 2.

However, *Orient* and *QLChG* are no longer statistically significant, which makes the partisan effects and the impact of the duration of the government mandate on the delay questionable, although previous results have indicated its presence.

[30] The programming used to estimate the heteroscedastic tobit model is available in Castro (2002).

[31] Other variables were included in the variance function but the results were quite similar, preserving the main conclusions obtained here.

The likelihood-ratio tests for the hypothesis of the homoscedasticity ($\delta = 0$), although not presented here, demonstrated the presence of heteroscedasticity. Thus, it is necessary to control for the heteroscedasticity in order to estimate the model correctly. Nevertheless, either controlling for heteroscedasticity using robust standard errors or with a heteroscedastic tobit model, the empirical results point out the important effect of political fragmentation on the *Delay*. Since a higher political fragmentation generates more conflicts and divergences, conflicts of interest can be considered as one of the main causes of the delays of inflation stabilizations in chronic inflation countries.

6. Conclusions

The empirical results of the tobit estimations over a panel of 10 countries affected by chronic inflation clearly show that the higher the fragmentation of the political system and the number of political parties represented in the parliament, the longer will be the delays of inflation stabilizations. Since this higher fragmentation generates more political and economic conflicts and divergences, conflicts of interest can also be considered one of the main causes of the delays of inflation stabilizations in chronic inflation countries. This means that the results obtained in this work are in agreement with the political models of conflict, more precisely with the "war of attrition" model of Alesina and Drazen (1991), and with the findings of Veiga (2000).

The evidence also shows that delays tend to be shorter in the authoritarian regimes that did not allow political parties, confirming the ideas of Haggard and Kaufman (1992). However, one must be aware that the social costs of an authoritarian regime could not compensate the benefits of an earlier stabilization and that political repression may not be the best way to implement sustainable economic reforms.

Some evidence is also obtained regarding the direct effects of political instability on delays. Although the heteroscedastic tobit estimations do not present any evidence, it may still exist, as it is shown by the previous results. Notice also that since higher political fragmentation tends to lead to greater political instability (according to Roubini and Sachs (1989)), the results present evidence supporting the idea that agreements are harder to obtain and stabilizations are delayed when there is political instability, which support the findings of Cukierman, Edwards and Tabellini (1992).

Contrary to my expectations, there is also some evidence that left-wing oriented governments are faster to stabilize high inflation than the right-wing oriented ones. According to Cukierman and Tommasi (1998), this situation may be possible, once sometimes substantial policy changes are implemented by parties with less reputation to implement them. However, as the heterocedastic tobit estimations reveal, the evidence of partisan effects on the delay is not clear.

Concerning the economic variables, results clearly show that the lower the growth of real *GDP*, the higher the budget deficit as a percentage of *GDP*, and the higher the oil price, the higher will be the delay of inflation stabilization. But, the evidence is not so obvious regarding the impact of external aid on delays. Actually, results show that its effects on delays are ambiguous: an ongoing aid program has no effects on delay; its duration has a positive effect; but the amount of credit seems to have a negative effect. The estimations also show that the available amount of foreign reserves has no impact on the delay of inflation stabilization, thus not confirming the hypothesis of Orphanides (1996a, 1996b) that foreign reserves are essential for hastening a stabilization.

Finally, the empirical evidence does not support the assumption that a higher inflation growth contributes to diminish the delay. Results show that neither the

inflation level nor its growth has effects on the delay of inflation stabilization, which contradicts the ideas of Drazen and Grilli (1993) and the results of Veiga (2000).

In conclusion, this work confirms that the structure of the political system helps to explain why sub-optimal (inflationary) policies are kept for long periods of time without the necessary corrective measures being implemented. Highly fragmented political systems and systems with a large number of parties represented in the parliament tend to present a higher political polarization and instability, which generates conflicts of interest. These conflicts between contending political parties make the approval of inflation stabilization measures harder and longer. Thus, this paper demonstrates that conflicts of interest are one of the main causes of the delays of inflation stabilizations in chronic inflation countries.

This study could be extended to other situations in which it takes time to achieve the necessary consensus for the approval and adoption of other political measures that may have redistributive implications.

It would also be interesting to do the same kind of work for other countries affected by chronic inflation, as some Eastern European countries. However, for these countries existing data are not enough and their quality is not always reliable, mainly for the years before the transition to a market economy. But, the high inflation levels registered in those countries are probably the result of the deep changes that affected their economies during (and after) their transition for a market economy and not the result of financing the deficit with seigniorage revenues, as it was the case of many Latin American countries.

References

Agénor, Pierre-Richard and Peter J. Montiel (1999), *Development Macroeconomics*. New Jersey: Princeton University Press.

Alesina, Alberto (1994), "Political models of macroeconomic policy and fiscal reforms," *in* Stephan Haggard e Steven B. Webb, eds., *Voting for Reform*. World Bank, New York, NY: Oxford University Press, 37-60.

Alesina, Alberto and Allen Drazen (1991), "Why are stabilizations delayed?" *American Economic Review*, 81(5), 1170-1188.

Alesina, Alberto and Guido Tabellini (1989), "External debt capital flight and political risk." *Journal of International Economics*, 27(3/4), 199-220.

Ball, Richard and Gordon Rausser (1995), "Governance structures and the durability of economic reforms: evidence from inflation stabilizations." *World Development*, 23(6), 897-912.

Banks, Arthur, ed., *Political Handbook of the World*. New York, NY: McGraw-Hill, several issues.

Bernholz, Peter (1995) "Necessary and sufficient condicions to end hyperinflations," *in* Pierre Siklos, ed., *Great Inflations or the 20th Century: Theories, Policies and Evidence*. Hants, UK e Vermont, US: Edward Elgar, 257-287.

Breen, Richard (1996), *Regression Models: Censored, Sample Selected or Truncated Data*. Sage University Paper Series on Quantitative Applications in Social Sciences, no. 07-111, Thousand Oaks, CA: Sage.

Bruno, Michael (1993), *Crises, Stabilization and economic Reform. Therapy by Consensus*. Oxford, New York, Toronto: Oxford University Press.

Bruno, Michael and William Easterly (1996), "Inflation's children: tales of crises that beget reforms." *American Economic Review*, 86(2), 213-217.

Calvo, Guillermo A. and Carlos A. Végh (1999), "Inflation stabilization and BOP crisis in developing countries," *in* J. B. Taylor e M. Woodford, eds., *Handbook of Macroeconomics*, Volume I. Elsevier Science B. V., Chap. 24, 1531-1614.

Casella, Alessandra and Barry Eichengreen (1996), "Can foreign aid accelerate stabilization." *The Economic Journal*, 106(May), 605-619.

Castro, Vítor (2002), *O Atraso na Implementação de Programas de Estabilização da Inflação como resultado de Conflitos de Interesses*. Dissertation Thesis, Master in Economic Policy, University of Minho, Braga, Portugal.

Castro, Vítor and Francisco J. Veiga (forthcoming), "Political Business Cycles and Inflation Stabilization." *Economics Letters*.

Cukierman, Alex e Mariano Tommasi (1998), "When does it take a Nixon to go to China?" *American Economic Review*, 88(1), 179-197.

Cukierman, Alex, Sebastian Edwards e Guido Tabellini (1992), "Seignioriage and political instability." *American Economic Review*, 82(3), 537-555.

Drazen, Allan (1996) "The political economy of delayed reform." *The Journal of Policy Reform*, 1(1), 25-46.

Drazen, Allan (2000), *Political Economy in Macroeconomics*. New Jersey: Princeton University Press.

Drazen, Allan and Vittorio Grilli (1993), "The benefit of crises for economic reforms." *American Economic Review*, 83(3), 598-607.

Easterly, William, 1996. "When is stabilization expansionary?" *Economic Policy* 22, 67-107.

Fernandez, Raquel and Dani Rodrik (1991), "Resistance to reform: *status quo* bias in the presence of individual-specific uncertainty." *American Economic Review*, 81(5), 1146-1155.

Gorvin, Ian, ed. (1989), *Elections Since 1945: A Worldwide Reference Compendium*. Longman International Reference, Chicago, IL: St. James Press.

Greene, William (2000), *Econometrics Analysis*, 4th edition. New Jersey: Prentice Hall.

Haggard, Stephan and Robert R. Kaufman (1992), "The political economy and stabilization in middle-income countries," *in* Stephan Haggard e Robert R. Kaufman, eds., *The Politics of Economic Adjustment*. Princeton, NJ: Princeton University Press, 270-315.

Haggard, Stephan and Steven B. Webb (1993), "What do we know about the political economy of economic policy reform?" *The World Bank Research Observer*, 8(2), 143-168.

Hamann, A. Javier (1999), "Exchange rate-based stabilization: a critical look at the stylized facts." *IMF Working Paper*, WP/99/132.

Heymann, Daniel and Axel Leijonhufvud (1995), *High Inflation*. Oxford: Clarendon Press.

Hibbs, Douglas (1977), "Political parties and the macroeconomic policy." *The American Political Science Review*, Vol. 7, 1467-1487.

Hoffmaister, Alexander W. and Carlos A. Végh (1996), "Disinflation and the recession-now-versus-recession-later hypothesis: evidence from Uruguay." *IMF Staff Papers*, 43(2), 355-394.

Hsieh, Chang-Tai (2000), "Bargaining over reform." *European Economic Review*, 44(9), 1659-1676.

International Monetary Fund, *Annual Report*. Washington D.C.: IMF, several issues.

International Monetary Fund, *International Financial Statistics*. Washington D.C.: IMF, several issues and CD-ROM version of January 2000.

Kiguel, Miguel and Nissan Liviatan (1991), "The inflation-stabilization cycles in Argentina and Brazil," *in* Michael Bruno et al., eds., *Lessons of Economic Stabilization and Its Aftermath*. Cambridge, Massachusetts: MIT Press, 191-232.

Kiguel, Miguel and Nissan Liviatan (1992), "The business cycle associated with exchange rate-based stabilizations." *The World Bank Economic Review*, 6(2), 279-305.

Labán, Raul and Frederico Sturzenegger (1994a), "Distributional conflict, financial adaptation and delayed stabilization." *Economics and Politics*, 6(3), 257-276.

Labán, Raul and Frederico Sturzenegger (1994b), "Fiscal conservatism as a response to the debt crisis." *Journal of Development Economics*, 45(2), 305-324.

Long, J. Scott (1997), *Regression Models for Categorical and Limited Dependent Variables*. Advanced Qualitative Techniques in the Social Sciences Series, v.7, Thousand Oaks, California, CA: Sage Publications.

Maddala, G. S. (1983), *Limited-Dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.

Maddala, G. S. and Forrest D. Nelson (1975), "Specification errors in limited dependent variable models." *NBER Working Paper Series*, WP 96.

Mainwaring, Scott and Timothy R. Scully (1995), *Building Democratic Institutions: Party Systems in Latin America*. Stanford, California: Stanford University Press.

McDonald, Ronald H. and J. Mark Ruhl (1989), *Party Politics and Elections in Latin America*. Boulder, CO: Westview Press.

Organization for Economic Cooperation and Development, *Main Economic Indicators*, Paris: OECD, CD-ROM edition, 2001.

Orphanides, Athanasios (1996a), "The timing of stabilizations." *Journal of Economics Dynamics & Control*, 20(1-3), 257-279.

Orphanides, Athanasios (1996b), "Optimal reform postponement." *Economics Letters*, Vol. 52, 299-307.

Rodrik, Dani (1991), "Premature liberalization, incomplete stabilization: the Özal decade in Turkey." In Bruno, Michael, et al., eds., 1991. *Lessons of Economic Stabilization and its Aftermath*. (MIT Press, Cambridge, MA), 323-353.

Rodrik, Dani (1993), "The positive economics of delayed reform." *American Economic Review*, 83 (May), 356-361.

Rodrik, Dani (1996), "Understanding economic policy reform." *Journal of Economic Literature*, 34 (March), 9-41.

Roubini, Nouriel (1991), "Economic and political determinants of budget deficits in developing countries." *Journal of International Money and Finance*, Vol. 10, Suplement, S49-S72.

Roubini, Nouriel and Jeffrey Sachs (1989), "Political and economic determinants of budget deficits in industrial democracies." *European Economic Review*, Vol. 33, 903-938.

Sargent, Thomas J. (1982), "The end of four big inflations," *in* Robert Hall, ed., *Inflation: Causes and Effects*. Chicago, IL: University of Chicago Press, 41-97.

TSP International (1999), TSP Users Guide and Reference Manual, version 4.5.

Végh, Carlos A. (1992), "Stopping high inflation: an analytical overview." *IMF Staff Papers*, 39(3), 626-695.

Veiga, Francisco J. (2000), "Delays of inflation stabilizations." *Economics and Politics*, 12(3), 275-295.

World Europa Yearbook. London, England: Europa Publications, several issues.

Table 1: Inflation Stabilization Programs

Country	Program dates/names	Type	Duration[a)]	Sources[b)]
Argentina	1959:3	ERBS	4	Kiguel and Leviatan (1992)
	1967:1	ERBS	0	Kiguel and Leviatan (1992)
	1973:3	ERBS	6	Kiguel and Leviatan (1992)
	1978:4 (Tablita)	ERBS	15	Kiguel and Leviatan (1992)
	1985:2 (Austral I)	ERBS	15	Kiguel and Leviatan (1991)
	1989:4 (Bonex)	MBS	10	Calvo and Vegh (1999)
	1991:2 (Convertibility)	ERBS	1	Calvo and Vegh (1999)
Bolivia	*1974:2 – no program*		*5*	
	1980:3 – no program		*4*	
	1985:3	ERBS	14	Végh (1992)
Brazil	1964:1	ERBS	3	Calvo and Vegh (1999)
	1986:1 (Cruzado)	ERBS	25	Kiguel and Leviatan (1991)
	1990:1 (Collor)	MBS	12	Calvo and Vegh (1999)
	1994:3 (Real)	ERBS	14	Ágénor and Montiel (1999)
Chile	1975:2	MBS	11	Calvo and Vegh (1999)
	1978:1 (Tablita)	ERBS	0	Calvo and Vegh (1999)
Dominican Rep.	*1985:3 – no program*		*4*	
	1990:3	MBS	10	Calvo and Vegh (1999)
Israel	1985:3 (Shekel)	ERBS	27	Calvo and Vegh (1999)
Mexico	*1974:2 – no program*		*2*	
	1984:1 – no program		*9*	
	1987:4	ERBS	7	Calvo and Vegh (1999)
Peru	*1981:3 – no program*		*23*	
	1985:3	ERBS	10	Agénor and Montiel (1999)
	1990:3	MBS	11	Calvo and Vegh (1999)
Turkey	1980:1	MBS	10	Rodrik (1991)
	1995:1 – no program		*4*	
Uruguay	1960:4	MBS	7	Hoffmaister and Vegh (1996)
	1968:2	ERBS	11	Calvo and Vegh (1999)
	1973:3 – no program		*6*	
	1978:4 (Tablita)	ERBS	0	Calvo and Vegh (1999)
	1990:4	ERBS	2	Calvo and Vegh (1999)

Notes: ERBS = Exchange Rate-Based Stabilization (17 in this sample);
MBS = Money-Based Stabilization (7 in this sample).
a) *Duration* refers to the duration of "high" inflation, in quarters, until the quarter before the implementation of an inflation stabilization program, or until the quarter in which inflation ceased to be "high" (no concrete program is implemented – see data in italic).
b) See Castro and Veiga (forthcoming) for a more complete list of inflation stabilization programs referred in the literature.

Table 2: Description of the Variables Used

Dependent variable:

Delay – Delay of "high" inflation stabilization, measured by the duration of "high" inflation (in consecutive quarters) since the first quarter in which it is considered "high", that is, since stabilization measures are considered clearly necessary, until a stabilization program started or inflation ceased to be "high".

Independent political variables:

FPS – degree of Fragmentation of the Political System.

FPS1 = 1 if no parties are allowed or there is only an exclusive one-party system, and = 0 for more fragmented political systems.

FPS2 = 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 otherwise.

FPS3 = 1 for more fragmented political systems, and = 0 if *FPS1*=1 or *FPS2*=1.

FIP – Fragmentation index of the distribution of seats in the lower house of the parliament:

$FIP = 1/\Sigma p_i^2$, where p_i = percentage of seats of party i.

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

QLChG – Number of quarters since the last change in government or election.

NGCh5 – Number of changes in government or elections that occurred in the last five years.

ChLY = 1 if the change in government or election occurred in the last year, and =0 otherwise.

Independent Economic variables:

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

ΔInf – Change in inflation: $\Delta Inf = ln(Inf) - ln(Inf(-1))$

TR/Imp – Ratio of Total Reserves to Imports.

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

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

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

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

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

OPI – Oil Price Index (base 1989, US Dollars).

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). Data on Oil Price Index was obtained from the *OECD Main Economic Indicators*.

Table 3: Delays of Inflation Stabilization

	1	2	3	4	5	6
FPS1	-7.83254 (-6.25)*** [-1.575]		-8.07810 (-6.40)*** [-1.624]	-8.16611 (-6,47)*** [-1.642]	-7.82536 (-6.23)*** [-1.574]	-7.85129 (-6.34)*** [-1.579]
FPS2	-5.48322 (-5.14)*** [-1.103]		-5.07537 (-4.70)*** [-1.021]	-5.38236 (-4.98)*** [-1.082]	-5.45953 (-5.03)*** [-1.098]	-5.39299 (-5.10)*** [-1.084]
FIP		0.897882 (2.31)** [0.1805]				
Orient	3.05929 (3.32)*** [0.6152]	2.00568 (2.19)** [0.4033]	3.20020 (3.38)*** [0.6435]	3.16040 (3.34)*** [0.6355]	3.06736 (3.32)*** [0.6168]	2.53795 (2.80)*** [0.5103]
QLChG	-0.260154 (-3.96)*** [-0.0523]	-0.245649 (-3.81)*** [-0.0494]			-0.260202 (-3.96)*** [-0.0523]	-0.243416 (-3.73)*** [-0.0489]
NGCh5			1.55264 (4.05)*** [0.3122]			
ChLY				1.80762 (2.14)** [0.3635]		
Δ*Inf(-1)*	-0.009866 (-0.29) [-0.0020]	-0.021593 (-0.57) [-0.0043]	-0.024111 (-0.68) [-0.0048]	-0.012098 (-0.35) [-0.0024]		0.009203 (0.27) [0.0019]
Inf(-1)					-0.000051 (-0.14) [-0.00001]	
TR/Imp(-1)	0.407664 (0.77) [0.0820]	0.082792 (0.15) [0.0166]	0.046863 (0.09) [0.0094]	0.213476 (0.39) [0.0429]	0.407643 (0.77) [0.0820]	0.368842 (0.72) [0.0722]
TFC/Imp(-1)	1.25885 (1.33) [0.2531]	2.15169 (2.14)** [0.4327]	1.13779 (1.17) [0.2288]	1.32268 (1.40) [0.2660]	1.28388 (1.32) [0.2582]	
Dur_aid	-0.332250 (-4.83)*** [-0.0668]	-0.330006 (-4.82)*** [-0.0664]	-0.313143 (-4.66)*** [-0.0630]	-0.323120 (-4.69)*** [-0.0650]	-0.333292 (-4.85)*** [-0.0670]	
IMFProg						0.495065 (0.61) [0.0995]
RGDP(-1)	-0.371554 (-4.63)*** [-0.0747]	-0.396252 (-4.95)*** [-0.0797]	-0.398389 (-4.91)*** [-0.0801]	-0.384489 (-4.68)*** [-0.0773]	-0.373359 (-4.53)*** [-0.0751]	-0.434350 (-5.51)*** [-0.0873]
FB/GDP(-1)	-0.768506 (-8.62)*** [-0.1545]	-0.840917 (-9.39)*** [-0.1691]	-0.733752 (-7.80)*** [-0.1475]	-0.807775 (-9.09)*** [-0.1624]	-0.770886 (-8.65)*** [-0.1550]	-0.798192 (-9.06)*** [-0.1605]
OPI	0.093698 (6.48)*** [0.0188]	0.084900 (5.70)*** [0.0171]	0.090640 (6.23)*** [0.0182]	0.098747 (6.81)*** [0.0199]	0.093656 (6.48)*** [0.0188]	0.086278 (6.15)*** [0.0173]
Sigma	9.00477 (23.96)***	9.30954 (23.88)***	9.04868 (23.99)***	9.11981 (23.77)***	9.00598 (23.97)***	9.00870 (23.55)***
Log Likelihood	-1344.60	-1363.35	-1345.82	-1350.54	-1344.59	-1353.63
Schwartz B.I.C.	1432.17	1447.28	1433.39	1438.11	1432.16	1437.56
McFadden R^2	0.1814	0.1700	0.1807	0.1778	0.1814	0.1759
No. Observations	1477	1477	1477	1477	1477	1477
No. Positive Observ.	297	297	297	297	297	297

Sources: see Tables 1 and 2.

Notes: *t*-statistics are in parentheses; the marginal effects are in brackets; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%; models estimated with a constant, 9 country dummies and 3 temporal dummies, by maximum likelihood (ML); *Sigma* represents the estimated standard-error for the residuals.

Table 4: Sensitivity Analysis

	1	2	3	4	5	6
FPS1	-5.22429 (-4.49)*** [-0.9798]		-6.44144 (-5.18)*** [-1.356]		-7.17541 (-5.22)*** [-1.731]	
FPS2	-4.44266 (-4.46)*** [-0.8332]		-4.38533 (-4.02)*** [-0.9228]		-9.15869 (-8.45)*** [-2.210]	
FIP		0.119020 (0.33) [0.0223]		0.871594 (2.27)** [0.1834]		1.14691 (2.64)*** [0.2767]
Orient	2.43173 (2.75)*** [0.4561]	1.56099 (1.81)* [0.2928]	1.93397 (2.06)** [0.4070]	1.20959 (1.31) [0.2545]	3.82486 (4.06)*** [0.9228]	2.83539 (2.97)*** [0.6841]
QLChG	-0.154759 (-2.62)*** [-0.0290]	-0.155067 (-2.72)*** [-0.0291]	-0.277709 (-4.20)*** [-0.0584]	-0.263457 (-4.07)*** [-0.0554]	-0.273504 (-4.46)*** [-0.0660]	-0.236818 (-3.79)*** [-0.0571]
Δ*Inf(-1)*	-0.003380 (-0.11) [-0.0006]	-0.016779 (-0.50) [-0.0031]	-0.022791 (-0.67) [-0.0048]	-0.029814 (-0.80) [-0.0063]	0.726254 (1.53) [0.1752]	0.577684 (1.01) [0.1394]
TR/Imp(-1)	0.396489 (0.79) [0.0744]	0.210366 (0.41) [0.0395]	0.578006 (1.04) [0.1216]	0.247417 (0.43) [0.0521]	-0.140046 (-0.26) [-0.0338]	-0.231129 (-0.39) [-0.0558]
TFC/Imp(-1)	0.468198 (0.51) [0.0878]	1.19820 (1.25) [0.2247]	1.76712 (1.94)* [0.3719]	2.22484 (2.31)** [0.4682]	2.02935 (2.17)** [0.4896]	3.06652 (3.05)*** [0.7398]
Dur_aid	-0.320810 (-4.66)*** [-0.0602]	-0.331508 (-5.02)*** [-0.0622]	-0.270077 (-4.05)*** [-0.0568]	-0.239978 (-3.66)*** [-0.0505]	-0.125152 (-1.84)* [-0.0302]	-0.181574 (-2.66)*** [-0.0438]
RGDP(-1)	-0.388199 (-5.30)*** [-0.0728]	-0.416741 (-5.65)*** [-0.0782]	-0.347193 (-4.37)*** [-0.0731]	-0.358036 (-4.54)*** [-0.0753]	-0.233669 (-2.78)*** [-0.0564]	-0.322177 (-3.81)*** [-0.0777]
FB/GDP(-1)	-0.821451 (-10.02)*** [-0.1541]	-0.905549 (-10.88)*** [-0.1698]	-0.655982 (-6.65)*** [-0.1380]	-0.698094 (-6.98)*** [-0.1469]	-0.748161 (-8.59)*** [-0.1805]	-0.854611 (-9.50)*** [-0.2062]
OPI	0.046908 (3.57)*** [0.0088]	0.037389 (2.76)*** [0.0070]	0.063875 (4.05)*** [0.0134]	0.052404 (3.29)*** [0.0110]	0.091156 (6.40)*** [0.0220]	0.083986 (5.79)*** [0.0203]
Sigma	8.41102 (21.72)***	8.58206 (21.68)***	8.49152 (23.33)***	8.73093 (22.78)***	8.32062 (22.53)***	8.82930 (22.72)***
Log Likelihood	-1258.41	-1271.10	-1137.01	-1148.26	-1188.86	-1220.29
Schwartz B.I.C.	1345.99	1355.03	1215.06	1222.76	1269.85	1297.76
McFadden R^2	0.1708	0.1625	0.1710	0.1628	0.1942	0.1729
No. Observations	1477	1477	1207	1207	1144	1144
No. Positive Observ.	277	277	254	254	276	276

Sources: see Tables 1 and 2.

Notes: *t*-statistics are in parentheses; the marginal effects are in brackets; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%; models estimated by maximum likelihood (ML) with a constant, 9 country dummies and 3 temporal dummies (columns 1 and 2); 7 country dummies and 3 temporal dummies (columns 3 and 4); and 9 country dummies and 2 temporal dummies (columns 5 and 6); Sigma represents the estimated standard-error for the residuals.

In columns 1 and 2 inflation is considered "high" if it is over twice the average inflation rate of the last five years or greater than 100 percent; in columns 3 and 4 Turkey and Israel are excluded from the sample; and in columns 5 and 6 are excluded all observations before 1970.

Table 5: Heteroscedastic Tobit for the Delays of Inflation Stabilization

	1a)	1b)	2a)	2b)
FPS1	-8.30171 (-6.17)*** [-1.669]			
FPS2	-5.36077 (-4.24)*** [-1.078]			
FIP			1.27129 (2.62)*** [0.2556]	
Orient	1.26753 (0.64) [0.2549]	3.58076 (3.31)***	0.817699 (0.42) [0.1644]	3.42838 (2.88)***
QLChG	0.025767 (0.21) [0.0052]	-0.268081 (-3.17)***	0.076641 (0.56) [0.0154]	-0.305459 (-3.14)***
Δ*Inf(-1)*	-0.016167 (-0.30) [-0.0033]		-0.016127 (-0.28) [-0.0032]	
TR/Imp(-1)	-0.080466 (-0.12) [-0.0162]		0.675983 (0.91) [0.1359]	
TFC/Imp(-1)	1.88908 (1.64) [0.3799]		3.45007 (2.63)*** [0.6938]	
Dur_aid	-0.317944 (-3.22)*** [-0.0639]		-0.357288 (-3.39)*** [-0.0718]	
RGDP(-1)	-0.261466 (-3.56)*** [-0.0526]		-0.279644 (-3.54)*** [-0.0562]	
FB/GDP(-1)	-0.836331 (-6.50)*** [-0.1682]	0.184203 (1.91)*	-0.906565 (-6.55)*** [-0.1823]	0.210917 (2.22)**
OPI	0.129893 (7.76)*** [0.0261]		0.117461 (7.47)*** [0.0236]	
Gama		9.86962 (6.48)***		10.7474 (6.71)***
Log Likelihood	-1324.07		-1341.04	
Schwartz B.I.C.	1426.24		1439.56	
McFadden R^2	0.1939		0.1836	
No. Observations	1477		1477	
No. Positive Observ.	297		297	

Sources: see Tables 1 and 2.

Notes: *t*-statistics are in parentheses; the marginal effects are in brackets; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%; models estimated by maximum likelihood (ML) with a constant, 9 country dummies and 3 temporal dummies.

In columns 1a) and 2a) are presented the estimated coefficients for each independent variable; in columns 1b) and 2b) are presented the estimated coefficients for the variance function used.