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INFLATION TARGETING WORKS WELL IN LATINAMERICA

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Abstract
This paper analyses the extent to which inflation targeting (IT) has improved macroeconomic performance in a group of Latin American countries during the period 2000-2005. In the first part we build a model to clarify some key features and expected results in emerging economies that have adopted the IT regime. In the empirical part we apply statistical tests with data from eighteen Latin American countries, and show that the five inflation targeters obtained both better short-term macroeconomic results and higher medium-term economic growth than the other Latin American countries in the sample.

Keywords: Monetary policy, inflation targeting, exchange-rate systems, economic growth
JEL classification: E52, F21, F33

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1. Introduction

Over the past fifteen years, an increasing number of emerging market countries (EMC) have adopted and implemented inflation targeting (IT) as a framework for policymaking[1]. As is well known, in such regimes the central bank is responsible for achieving a publicly announced target for the inflation rate. Since the choice of the monetary regime is important for both the effectiveness of stabilisation policies and longer run growth effects, it is justified to investigate the extent to which the shift toward the new regime has improved the economic performance of emerging market economies.

The available literature on this general topic has two important drawbacks that affect both the theoretical and the empirical sides of the analysis. As regards theoretical reasoning, authors usually fail to evaluate correctly the nature and consequences of some key features in EMC under IT. Let us examine two examples. The first deals with the empirical finding that the economic policies implemented by some EMC with IT have pro-cyclical nature, which contributes to destabilise economic activity. The explanation for this result provided by Calderón and Schmidt-Hebbel (2003b) and Libanio (2005), among others, is that stabilisation actions have not been adopted in the right way[2]. We claim that in many cases the pro-cycle orientation of monetary actions in EMC reflects instead optimal policy reactions to external shocks.

The second example is the evaluation of the nature and effects of "fear of floating" in EMC. Some authors, such as Eichengreen and Hausmann (1999) and Calvo and Reinhart (2002) consider that "fear of floating" is inherent to EMC because these economies are affected by: a) weak institutions and credibility, b) high levels of liability dollarisation, and c) significant degrees of pass-through. They show that these features "oblige" the authorities to dampen exchange rate movements at the cost of raising the level and variability in the domestic interest rate. The direct implication is that these countries cannot operate flexible exchange rates – even with the help of an IT scheme – without suffering significant losses in terms of output and employment. Our contention is that exchange rate smoothing via intervention in the foreign exchange market and management of the domestic interest rate is an optimal strategy of the EMCs under certain circumstances. Furthermore, we show that fear of floating may be compatible with IT.

As far as the empirical side is concerned, we would like to stress the fact that the economic implications of the IT regime in emerging economies have been the subject of little empirical work. Furthermore, the studies available refer almost exclusively to experiences from the past decade. They may be gathered in two broad groups. The first one compares economic results between countries under IT (including industrial and

[1] The volume edited by Bernanke and Woodford (2005) explores many dimensions of IT for both developed and emerging economies.

[2] This interpretation traces back the view that developing countries cannot avoid fiscal and monetary policies that deepen business cycles. See, for instance, Gavin and Hausmann (1998) and Talvi and Végh (2000).

developing countries) and countries that did not adopt this regime. For instance, Bernanke et al. (1999) show that IT does not make a difference with regard to the cost and speed of price stabilisation. Cecchetti and Ehrmann (2002) focus on the effects of IT on inflation aversion, and find that countries under IT do not exhibit higher aversion, on average, than countries under alternative monetary regimes. Mishkin and Schmidt-Hebbel (2002) find that specific structural features may explain the economic results of IT countries. Calderón and Schmidt-Hebbel (2003a), (2003b) show that IT countries have been able to reduce both inflation rates and inflation-target misses systematically after adopting the new monetary regime in a group of Latin America and Caribean countries. Finally, Corbo et al (2002) found that IT did contribute to improve macroeconomic results in a large sample of industrial and developing countries.

The second group of empirical studies focuses on the implications of some specific features of the IT regime. Céspedes and Soto (2005), for example, investigate the influence of different degrees of credibility on the trade-off between output and inflation in IT countries, and apply their theoretical analysis to the Chilean experience during the nineties. Gallego and Jones (2005) analyse the extent to which "fear of floating" is an optimal policy choice in emerging market economies that adopt IT. Libanio (2005) analyses the pro-cyclical and asymmetric nature of monetary policy in three IT Latin American countries (Brazil, Chile and México) and derives some implications for economic stabilisation and growth in these economies. Finally, Leiderman et al. (2006) study the extent to which IT may be a successful strategy in highly financial dollarised economies.

Our intended contributions in this paper are twofold. The first is to build a general macroeconomic model adapted for an open EMC that anchors its monetary policy to explicit targeted inflation bands. By including key institutional and economic features from these countries in the model we intend to clarify the expected macroeconomic effects of IT. The second objective is to investigate empirically the economic effects of IT on a group of Latin American countries over a recent period that starts in January 2000. We include some points that have not been studied so far – for instance the effects on economic growth – and cover a recent period that has been very little investigated.

The rest of the paper is organised as follows. Section 2 presents the theoretical model and applies it to discuss and clarify some issues related to IT in EMC. In Section 3 we perform a battery of statistical tests to assess the effects of IT on the most important macroeconomic variables. Finally, Section 4 summarises the main theoretical and empirical results.

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2. Theoretical framework

In this section we present a stochastic general equilibrium model that contains the key elements of the inflation-targeting regime. We consider a small open economy whose monetary authorities are concerned with stabilising both inflation and output around the desired values of these variables. We extend the framework of Fraga, Golfajn and Minella (2003) by including important ingredients of EMC. Our model is composed of the following equations[3]:

$$L = \frac{1}{2} E_t \left\{ \sum_{i=0}^{\infty} \beta^i \left[\omega_y \tilde{y}_{t+i}^2 + \left(\pi_{t+i} - \pi_{t+i}^T \right)^2 \right] \right\} \tag{1}$$

$$\pi_t = \lambda_{\tilde{y}} \tilde{y}_t + \lambda_{\tilde{y}^*} \tilde{y}_t^* + \beta E_t(\pi_{t+1}) + \left[\lambda_q + (1-\gamma)(1+\beta) \right] q_t - (1-\gamma) q_{t-1} - \beta(1-\gamma) E_t(q_{t+1}) + \mu_t \tag{2}$$

$$y_t = s_c h_y E_t(y_{t+1}) + s_c h_q E_t(q_{t+1}) + s_c h_{b^*} E_t(b_{t+1}^*) - s_c h_{b^*} b_t^* - \frac{s_c}{\gamma_c} r_t + (s_q + s_x \eta) q_t$$
$$+ s_x y_t^* + s_g g_t - s_c h_g E_t(g_{t+1}) + s_c \phi_t \tag{3}$$

$$r_t - r_t^* = \psi \left[E_t(q_{t+1}) - q_t \right] + \zeta_t \tag{4}$$

Equation (1) is a standard social loss function of a country that targets an inflation band – flexible inflation targeting - instead of a rigid inflation point. The social loss is related positively with two types of deviations: a) differences between current and potential output ($\bar{y}$), that is, the output gap ($\tilde{y}$), and b) differences between the current rate of inflation (π) and the targeted rate of inflation (π^T). The coefficient ω_y measures the relative weight attached to output variability. It usually takes a value between *0* and *1*, indicating that, in countries implementing IT, central bank aversion to output variability is lower than aversion to inflation variability. At any rate, the objective of output stabilisation must also be clearly apparent in order for the central bank not to lose social support.

Equation (2) is the aggregate supply in the spirit of the New Keynesian Phillips curve. This equation incorporates inertia in price setting following the Calvo (1983) approach. Parameter μ is a negative supply shock that increases domestic production costs. Our version extends Calvo's equation by including two elements of an open economy: the real exchange rate, *q*, and the foreign output gap, $\tilde{y}^*$.

[3] The system has been derived by assuming that agents – private and public - adopt optimal decisions.

Equation (3) establishes that the aggregate demand as usual depends on the real interest rate, r, with a negative sign, and on the real exchange rate, government consumption, g,, external demand shocks, φ, and the expected domestic output for the next period, with a positive sign. The latter influence is due to smoothing consumption by households that maximise an inter-temporal utility function under budget constraints. The novelty of this equation is that it includes three additional influences: a) foreign output (y*), b) expected government expenditures, and c) an expected increase in the stock of household's foreign debt measured in hard foreign currency (b*). Foreign output impacts positively on the demand for domestic goods because it stimulates domestic exports; expected government expenditures have a negative influence because this creates expectations of tax increases in the coming years. The reason why expected increases in foreign debt have positive effects on the demand for domestic goods is that they provide external financing for domestic consumption.

Equation (4) is the uncovered real-interest rate parity condition including a stochastic country risk premium, ζ.

It is assumed that the private sector form rational expectations on inflation and output. After looking at the realisation of shocks in the current period, the central bank uses all the available information to set its monetary policy, following a two-step procedure. In the first step, it minimises the loss function to determine the optimal value of both the inflation differential and the output gap assuming that it cannot commit itself to a state-contingent rule of the inflation rate. In the second step, the central bank determines the value of the policy instrument, the domestic interest rate, to achieve its main policy goals. The exchange rate adjusts endogenously. The whole process is summarised in the resolution of the model for the four endogenous variables, y_t, π_t, q_t, r_t. The short-term equilibrium is given by the following expressions[4]:

$$y_t = A_1 y_t^* + A_2 \bar{y}_t^* - A_3 \mu_1 + A_4 a_t - A_5 b_t^* + A_6 g_t - A_7 r_t^* - A_8 \varsigma_t + A_9 \varphi_t \quad (5)$$

$$\pi_t = -H_1 y_t^* + H_2 \bar{y}_t^* + H_3 \mu_t + H_4 a_t + H_5 b_t^* - H_6 g_t + H_7 r_t^* + H_8 \varsigma \; - H_9 \varphi_t + \pi^T \quad (6)$$

$$q_t = -K_1 y_t^* + K_2 \bar{y}_t^* - K_3 \mu_3 + K_4 a_t + K_5 b_t^* - K_6 g_t + K_7 r_t^* + K_8 \varsigma_t - K_9 \varphi_t \quad (7)$$

$$r_t = R_1 y_t^* - R_2 \bar{y}_t^* + R_3 \mu_3 - R_4 a_t - R_5 b_t^* + R_6 g_t + R_7 r_t^* + R_8 \varsigma_t + K r_9 \varphi_t \quad (8)$$

Algebraic signs are the signs of the corresponding coefficients. Equation (8) indicates that the monetary authorities use all available information embodied in the observed set of shocks – of both domestic and foreign origin – to determine the best settings for the

[4] For reasons of space we do not present here the resolution of the system. It may be obtained from the authors upon request.

real interest rate. The central bank uses a policy reaction function in terms of nominal interest rate to achieve the desired values of the real interest rate. The endogenous values of output and inflation are derived under the condition that price stability is the primary goal of the central bank – reflected by the fact that deviations of the inflation rate with respect to the announced target is assigned a relatively high weight in the loss function.

For the IT regime to work satisfactorily and deliver the expected outcomes, it must fulfil three important institutional features that constrain discretion in the design and implementation of monetary policy. First, the central bank must be strongly committed to achieving price stability as its primary goal. In turn, this implies that the central bank must be independent by law, and receive a clear mandate to achieve its main objective. Second, it is necessary that the central bank makes its monetary policy fully transparent and maintains regular channels of communication with the public. The general public, financial markets and politicians must be constantly informed about the goals of monetary policy, the numerical values that are given to the inflation target, how this target will be achieved, and the reasons for possible deviations from the targets. Third, the central bank must be accountable. Finally, a strong fiscal position and a sound financial system must be present to guarantee the medium term sustainability of the IT regime. In our model, fiscal discipline is assured by the fact that budgetary decisions of the government are subject to an inter-temporal constraint.

In the following lines, we will use this theoretical background to analyse two important issues discussed in the recent literature. The first is the extent to which IT makes monetary policy more pro-cyclical; and the second is to examine the compatibility between IT and fear of floating in EMC.

2.1 Is monetary policy pro-cyclical?

Traditionally, this issue has been analysed by estimating the relationship between changes in the domestic real interest rate, on the one hand, and variations in domestic output, on the other. Calderón and Schmidt-Hebbel (2003b), for instance, performed regression analysis to estimate the relationship between the deviations of the real interest rate from the country sample mean – the dependent variable - and two explanatory variables: the GDP deviation from the HP-filtered country GDP trend – the business cycle variable -, and an indicator of the interaction between the cycle and the level of the country-risk. These authors obtained that in emerging market economies monetary policy becomes significantly pro-cyclical when the level of country-risk is sufficiently high. Libanio (2005) estimated a VAR model to examine the relationship between nominal interest rate and variations of domestic output in Brazil, Chile and Mexico. He obtained pro-cyclical policy responses in Brazil and Chile.

To give a correct answer to this question using our model as a guide, we should look at equations (5) and (8). Pro-cyclical reactions exist whenever changes in domestic output have the opposite sign to that of variations in the domestic real interest rate. Conversely,

policy reactions must be considered counter-cyclical whenever changes in these two variables share the same algebraic sign. Table 1 presents the signs of the partial derivatives of output and interest rate with respect to each external shock.

Table 1
Pro-cyclical and counter-cyclical policy reactions

Endogenous reactions	Shocks								
	$\Delta\bar{y}_t^*$	$\Delta\mu_t$	Δa_t	Δr_t^*	$\Delta\zeta_t$	Δy_t^*	Δb_t^*	Δg_t	$\Delta\phi_t$
Δy_t	+	-	+	-	-	+	-	+	+
Δr_t	-	+	-	+	+	+	-	+	+
Politic	Pro-cyclical					Counter-cyclical			

It is readily apparent that policy reactions of the central bank may be either pro-cyclical or counter-cyclical, depending on the specific nature of shocks that hit the economy. For instance, an increase in the level of foreign potential output, gives rise to an increase in domestic output and a decrease in the domestic real interest rate. The latter is considered a pro-cyclical reaction of monetary policy. However, an increase in government expenditures causes positive variations in both endogenous variables, implying a counter-cyclical reaction in the monetary policy. In so far as external shocks have some persistence, because they are AR processes for instance, pro-cyclical and counter-cyclical reactions will manifest during several years.

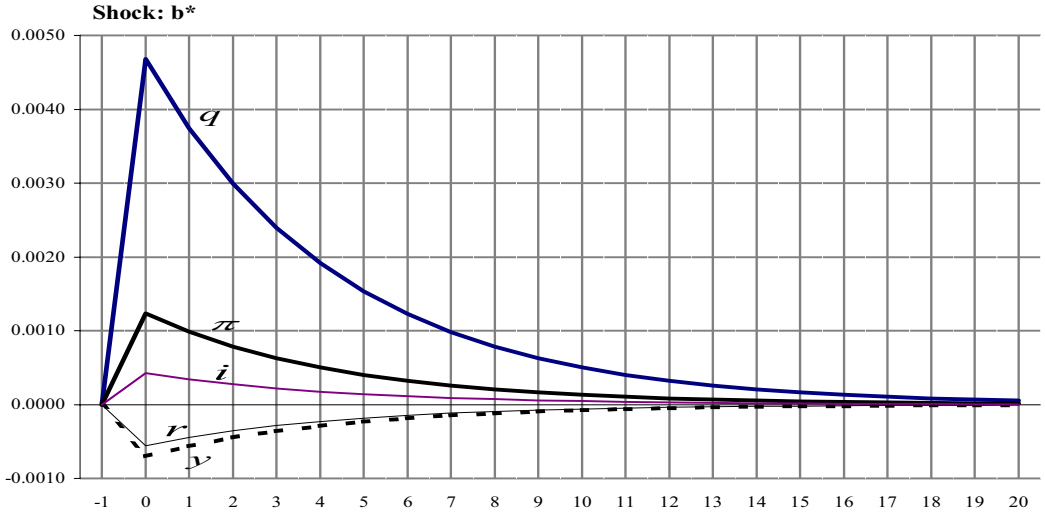
2.2 Fear of floating

Gallego and Jones (2005) qualified the "fear of floating" argument, explaining that whether it is convenient to dampen fluctuations in the nominal exchange rate crucially depends on the circumstances under which these policy actions take place. In normal times, when the supply of external liquidity is not in danger, countries will optimally prefer to avoid the inflationary effects of exchange rate instability and will intervene, either using their international reserves or modifying the nominal interest rate. However, during severe crises, the optimal choice is to let the exchange rate float freely ("benign neglect") in order to create incentives in the private sector to insure itself against the negative effects of the "bad" state. We can illustrate these arguments with the help of our model.

Consider first a situation characterised as a "good" state, where no potential crisis threatens the economy of the country. In that case there is no shortage of international liquidity, and therefore no issues of insurance; the government optimally decides ex-post actions. Suppose, for instance, that the stock of foreign debt increases to meet new demand for imports of domestic consumers. By assigning values to the parameters of

our model, in the accepted range of the empirical literature, we can trace the path of the four main endogenous variables as responses to an increase in b^*. When assuming that b_t^* is an AR(1) process with an autoregressive coefficient equal to 0.8, the simulated responses of q, π, i, r, and y to an exogenous Δb_t^* are represented in graph 1. As can be seen, the real exchange rate depreciates strongly in the very short run, whereas the rest of variables respond with much lower impetus. It can be shown that the strength of responses of the real exchange rate, directly linked to the size of the coefficient K_5, crucially depends on a) the intensity and speed to which variations in the nominal exchange rate are passed through to prices of both the consumption basket and the bundle of imported inputs[5], b) the share with which domestic consumption is financed with external debt, and c) deficiencies in the functioning of internal markets. In transition countries with significant pass-through, high debt coefficient and fragile and emerging markets – the last feature is not included in our model -, depreciations will be sharp, which in turn will negatively affect the profitability of firms and sectors and, thus, increase inflation and depress economic activity beyond the levels presented in the graph.

Graph 1
Responses to an increase in the stock of foreign debt



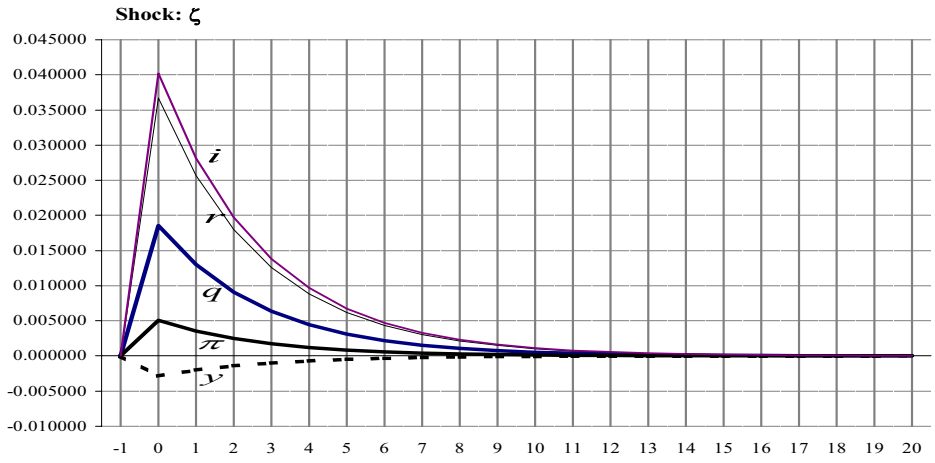
Aware of these negative effects, the monetary authorities of countries featuring these institutional weaknesses frequently react by curtailing the excessive movements in the nominal exchange rate. The "fear of floating" response is fully justified in this case[6].

[5] According to Frankel, Parsley and Wei (2005), the pass-through coefficient in poor countries is on the order of ten times as high as it is for high income countries.

[6] The usefulness of these occasional interventions in the foreign exchange market depends on the ability of monetary authorities to effectively and efficiently sterilise the derived effects on the monetary base. It

Things look very differently in the "bad" state, when the probability of sudden stops in external financing is high. In terms of our model, this situation may be represented by a significant increase in the country risk, $\zeta_{t,}$ which manifests itself some periods before the sudden stop materialises. If the government behaves passively, letting the exchange rate move freely, the endogenous variables will adjust as indicated by equations (5) to (8): the real interest rate and the inflation rate will increase, the real exchange rate will deteriorate, and domestic output will fall. Simulations of our model, when assuming that the country risk is an AR(1) process with an autoregressive coefficient equal to 0.7, confirm these results and deliver the paths represented in graph 2.

Graph 2
Responses to an increase in the country risk



The nominal and real interest rates increase sharply because they are pushed up by two complementary influences: one is the increase in the country risk premium, and the other is the expected depreciation in the real exchange rate. Both factors contribute to favour the return to hoarding international liquidity, helping to ameliorate, in anticipation of the shock, the under-insurance of the private sector. Therefore, a floating exchange rate is the optimal policy from an ex-ante perspective.

The difficulty in implementing exchange rate flexibility in a "bad" state is that if government cannot commit to future floating during sudden stops in the "bad" state, expectations of depreciation in the exchange rate will not emerge, or will be too small. As a result, the real interest rate will not increase sufficiently, and the private sector will not adopt sufficient preventive actions. Once the crisis occurs, the government will find it optimal to intervene to avoid the negative influences of excessive exchange rate fluctuations. In this case, the time-consistent equilibrium entails "fear of floating".

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is well known that imperfect substitutability between domestic and foreign assets may bring up this possibility.

To sum up, fear of floating is optimal in the "good" state, but will contribute to under-insurance, and to excess volatility of the interest rate, during financial crises in the "bad" state. Moreover, as emphasised by Mishkin (2004), responding too heavily and too frequently to movements in a flexible exchange rate increases the risk of transforming the exchange rate into a nominal anchor that takes precedence over, or conflicts with, the inflation target.

In order to avoid fear of floating in the "bad" state and its detrimental consequences, the authorities need to build credibility and reputation for floating during crises. In the transition process toward high credibility, monetary authorities should choose exchange rate flexibility at all times. And when they undertake the first exchange rate interventions in "good" times, the rationale of these actions should be clearly explained to the public. Transparency about the role of these interventions will make the promise that these actions will not apply during "bad" periods more credible.

2.3 Expected positive effects of IT

The preceding discussion allows us to draw up the potential positive effects of IT in EMC when the credibility of the central bank has already surpassed an intermediate level. First, we should expect this regime to bring about better macroeconomic outcomes in the short term, namely, good combinations of (low) inflation and (small) output gaps, independently of the fact that monetary policy may be pro-cyclical under certain circumstances and counter-cyclical under other situations. Second, we should also expect lower variability in the main macroeconomic variables. Third, as a result of the former results, economic growth should increase in the medium term.

In the following section we perform statistic tests to analyse whether these expected results have materialised in recent years in a large group of Latin American countries considered emerging economies.

3. Empirical analysis

Our hypotheses are tested for 18 Latin American countries, which offer not only a variety of different exchange rate regimes, but also a number of very different monetary and institutional arrangements.

3.1 Exchange rate regimes

Table 2 reports the exchange rate regimes declared by these countries to the IMF, in three different years of our study: 1985, 2002 and 2005. As can be seen, the general tendency is a switch from intermediate regimes toward corner solutions: while in 1985

intermediate arrangements represented 14 over the total of 18 exchange rate regimes, in 2004 the share fell down to 4/18. According to the empirical study of Calderón and Schmidt-Hebbel (2003b), the structural break took place in 1998, immediately after the Asian crisis.

Among the 10 currently floaters in 2005, five operate independent and free flexibility in the exchange rate: they are, indeed, the countries whose monetary policy hinges upon an announced inflation target. Their authorities do not recognize systematic interventions to dampen the fluctuations of their exchange rate.

Table 2
Exchange rate regimes in Latin America

	1985	2002	2005
South America			
Argentina	Intermediate	Flotation	Flotation (MF)
Bolivia	Flotation	Intermediate	Intermediate (CP)
Brazil	Intermediate	Flotation	Flotation (IF)*
Chile	Intermediate	Flotation	Flotation (IF)*
Colombia	Intermediate	Flotation	Flotation (IF)*
Ecuador	Intermediate	Rigid peg	Rigid peg (NS)
Paraguay	Intermediate	Flotation	Flotation (MF)
Peru	Intermediate	Flotation	Flotation (IF)*
Uruguay	Flotation	Flotation	Flotation (MF)
Venezuela	Intermediate	Flotation	Rigid peg (NS)
Central America			
Costa Rica	Intermediate	Intermediate	Intermediate (CP)
El Salvador	Intermediate	Rigid peg	Rigid peg (NS)
Dominican Rep.	Intermediate	Intermediate	Flotation (MF)
Guatemala	Intermediate	Flotation	Flotation (MF)
Honduras	Flotation	Intermediate	Intermediate (CB)
Mexico	Intermediate	Flotation	Flotation (IF)*
Nicaragua	Intermediate	Intermediate	Intermediate (CP)
Panama	Rigid peg	Rigid peg	Rigid peg (NS)

Source: Berg, Borensztein and Mauro (2002, p.25) and own elaboration.
CP: *Crawling peg*
CB: *Rates within crawling bands*
IF: *Independently floating*
MF: *Managed float with no pre-announced exchange rate path*
NS: *No separate legal tender*
*: The country has adopted an IT regime

3.2 Inflation targeting in Latin America

Five Latin American countries have to date adopted inflation targeting strategies with more or less intensity. Mishkin and Savastano (2002) present a detailed analysis of the characteristics of these regimes up to 2001. Table 3 updates the main features to 2004

for the five countries. Chile is the first country (September 1991) that gave independence to its central bank and announced price stability as one of their primary objectives. As a result, the domestic inflation rate gradually decreased. However, it was only in 1999 when the central bank explicitly announced a multi-year target for inflation. In May 2000 the central bank began to elaborate an Inflation Report in which it publishes its baseline inflation forecasts. Healthy public finances and a sound financial system are two key features of the Chilean economy that have supported a full-fledged inflation targeting regime in this country.

Table 3
Inflation targeting regimes of individual countries

Country	Starting date and main features
Chile	**Starting date:** January 1991 **Inflation targets:** 15-20% (1991), 3.5% (2000), 2-4% (since 2001) **Inflation Report and announcement of multi-year targets :** May 2000 **Strong fiscal position and sound financial system**
Brazil	**Starting date:** January 1999 **Inflation targets:** 8% (1999), 6% (2000), 4% (2001) with ± 2% band; 4% (2003), 5.5% (2004), with ± 2.5% band **Inflation Report and announcement of multi-year inflation targets :** June 1999. **Weak fiscal position, and relatively sound financial system**
Colombia	**Starting date:** January 2000 **Inflation targets:** 10% (2000), 8% (2001), 5-6% (2003), 3.5-5.5% (2004) **Inflation Report:** January 1999 **Announcement of multi-year targets:** October 2000 **Strong fiscal position and sound financial system:** since 2003
Mexico	**Starting date:** January 1999 **Inflation targets:** <13% (1999), <10% (2000), 3% (since 2003) with ± 1% band **Inflation Report and announcement of multi-year inflation targets :** April 2000 **Strong fiscal position and relatively sound financial system**. Since 2000
Peru	**Starting date:** January 1994 **Inflation targets:** 15-20% (1994), 5-6% (1999), 2.5% (since 2002) with ± 1% band **Inflation Report and announcement of multi-year inflation targets:** June 2002. **Weak fiscal position, but relatively sound financial system** since 1995.

In 1999 Brazil started a monetary policy regime with all the key ingredients of an IT regime. The central bank immediately published a comprehensive Inflation Report. This action, coupled with a relatively strong banking system and a substantial slack in the economy, are the elements that have contributed to support IT in Brazil. In order to assure the success of the IT scheme in Brazil, independence of the central bank needs to be enhanced and increased. Moreover, fiscal deficits must be brought back to levels that remove any possibility of fiscal dominance.

As of 1991 the central bank of Colombia started to announce explicit numerical targets for the one-year rate of inflation. The anti-inflationary strategy failed until 1999 because the central bank continued to give priority to other objectives, especially output

stabilisation and external competitiveness, whenever these goals were threatened by the inflation target. Furthermore, the budget deficit was not sufficiently controlled until that year. The strategy changed positively from September 1999 when the exchange rate began to float freely and the central bank released Inflation reports on a regular basis. The announcement of multi-year inflation targets since October 2000 has also contributed to the success of the new regime in the last years.

The central bank of Mexico waited until it acquired sufficient anti-inflationary credibility to put in place a fully fledged IT regime. This occurred in January 1999, when the annual rate of inflation (12.3%) underscored the 13% target. In April 2000 the Mexican central bank started to publish its monthly Report on inflation.

The announcement of inflation targets in 1994 initiated a period of anti-inflationary success in Peru. The inflation rate fell from levels of over 20% in 1994 to 3% in 2001. However, Peru's monetary authorities did not gain sufficient credibility during that period because their monetary framework lacked many crucial features of an IT regime, for instance, the announcement of multi-year inflation targets, publication of inflation reports and mechanisms for making the central bank accountable. In June 2002 these drawbacks were almost completely corrected, and the monetary policy started to fulfil the key elements of a true IT regime.

3.3 Macroeconomic performance. Descriptive analysis

In order to get a first impression of the extent to which IT regime may have contributed to improve macroeconomic results in the incumbent five Latin American countries, we have put together a database of monthly data for the relatively long period 1980:1-2005-11 for three relevant variables: inflation rate (monthly observations), rate of GDP growth (annual data) and short-term interest rate (monthly data). The sample is split in two periods in each country, taking into account the starting date of the IT regime. The details concerning the length of each sub-sample are presented in Table 4. As a general rule, sample 1, corresponding to the period preceding IT, excludes the years of hyperinflation and exchange-rate crises of each country.

Table 4
Sub-samples for each country

Country	Sample 1*	Hyperinflation period	Sample2
Brazil	1981:12-1998:12	1988:09-1991:02 1992:04-1995:01	1999:01-2005:11
Chile	1980:01-1990:12		1991:01-2005:11
Colombia	1980:01-1999:12		2000:01-2005:11
Mexico	1980:01-1998:12		1999:01-2005:11
Peru	1980:01-1993-12		1994:01-2005:11

Sample 1 comprises the years before the adoption of IT
Sample 2 comprises the years after the adoption of IT
Sample I excludes the years of hyperinflation and exchange-rate crises

3.1.1 Time series analysis

Table 5 reports the average and standard deviation of the monthly rates of **inflation** computed on annual basis for each sub-sample and country. As far as average values are concerned, it is clearly apparent that the inflation rate decreased sharply from the first to the second sub-period in each country. Brazil reaped the best results even without taking into account the huge inflation numbers of its hyperinflation years. On average, the inflation rate fell in the second period down to 1/8 of the value achieved during the first sample.

Table 5
Inflation

	Average inflation on annual basis		Standard deviation	
Country	**Sample 1**	**Sample 2**	**Sample 1**	**Sample 2**
Brazil	128.87	8.09	139.43	3.57
Chile	21.89	7.55	8.20	5.87
Colombia	22.86	7.31	5.03	1.27
Mexico	46.69	7.80	39.62	4.45
Peru	99.40	7.11	52.49	6.88
Average	**63.94**	**7.57**	**26.43**	**4.41**

As regards variability of the inflation rate, the third and fourth columns of Table 5 illustrate reductions of similar order to those of the average in each country. The fall in the variability is especially pronounced in the countries with highest initial inflation levels. To sum up, the improvement in inflation is remarkable in all countries, and has taken place at both levels and variability.

Table 6 reports the same information for **economic growth** computed as annual changes in the real GDP. It seems that the adoption of an IT regime is accompanied by a generalized increase in growth – only Colombia and Mexico present a light reduction - and a substantial reduction in the dispersion of this variable in each country.

Finally, Table 7 provides similar information to that of the preceding tables but referred to the nominal interest rate of bank deposits. As can be seen, both average levels and standard deviations also decrease substantially in each country. These changes completely contradict the results of Calvo and Reinhart (2002). In fact, for the countries that we include in the empirical analysis, IT clearly contributes to easing the task of monetary policy and to reducing tensions in money and credit domestic markets. Consequently, it is not strange that IT creates a favourable environment for investment decisions, which in turn contributes to increase economic growth.

Table 6
GDP growth

	Average rate of GDP growth		Standard deviation	
Country	**Sample 1**	**Sample 2**	**Sample 1**	**Sample 2**
Brazil	2.21	2.23	3.61	1.87
Chile	3.31	5.32	6.20	2.93
Colombia	3.16	2.78	2.29	1.31
Mexico	2.71	2.67	4.03	2.60
Peru	0.19	4.29	6.86	3.94
Average	**2.33**	**3.46**	**4.60**	**2.53**

Table 7
One-month interest rate of bank deposits

	Average rate of interest		Standard deviation	
Country	**Sample 1**	**Sample 2**	**Sample 1**	**Sample 2**
Brazil	284.69	19.60	442.85	5.33
Chile	31.15	11.47	14.48	7.43
Colombia	30.46	9.82	5.10	2.21
Mexico	37.71	5.93	24.32	3.47
Peru	62.35	12.15	34.70	6.33
Average	**89.27**	**11.79**	**104.29**	**4.95**

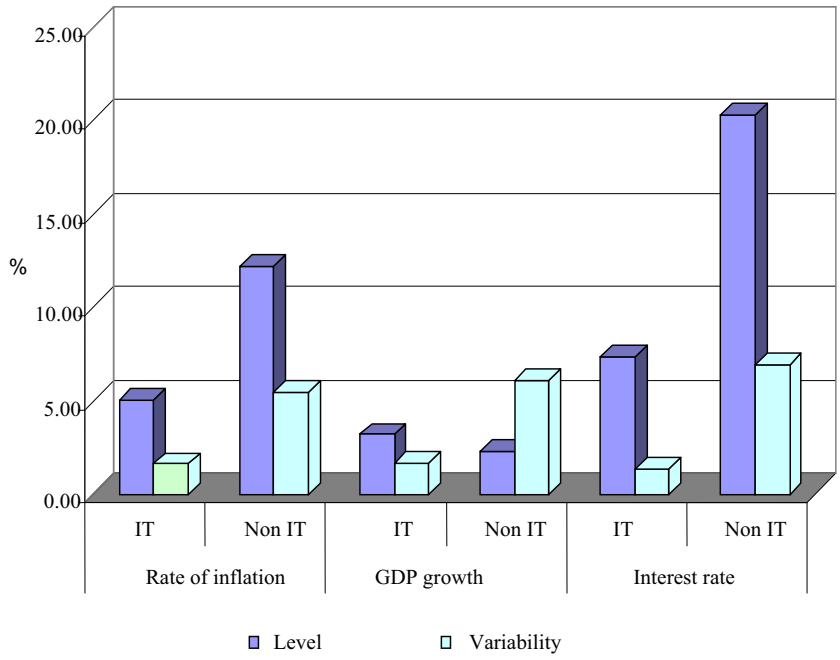
3.1.2 Cross-section analysis

In order to get a more comprehensive understanding of the results derived from the adoption of the IT regime, it is useful to compare the macroeconomic performance of two groups of Latin American economies: countries with IT and countries without IT. In the first group we include the five countries considered in the preceding section; the second group is composed of thirteen countries: Argentina, Bolivia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Dominican Republic, Uruguay and Venezuela. We compute cross-sectional monthly values for the period 2000:01-2005:11 and for the two groups. In order to dispose of observations not affected by internal crises, in the case of Argentina we excluded the observations from the two years 2000 and 2001.

Graph 1 presents the results for three variables and the two groups of countries. As can be seen, the results support the conclusions of the preceding time series analysis: compared with countries that did not adopt IT regimes during the sample period, those that engineered IT frameworks with fully flexible exchange rates obtained: a) lower and less variable rate of inflation, b) higher rates of GDP growth coupled with lower

variability in this variable, and c) much lower levels and variability in short-term interest rates.

Graph 1
Average and variance of inflation, economic growth and interest rates in IT and non-IT countries (2000:01-2005-11)



3.4 Macroeconomic performance. Statistical tests

3.4.1 Analysis of independence

In this section we undertake an analysis of statistical independence to ascertain whether there is a relationship between adopting an IT regime and some economic results related to the rate of inflation, the domestic interest rate and the rate of GDP growth. We use the independence test χ^2 in the same way as it was applied by Edwards (2004) to analyse the independence between flexible exchange rates and current account crises.

We work with on sub-sample composed of the countries and/or years that have operated with flexible exchange rate arrangements. Consequently, we have a group of 15 countries, the whole set used in the descriptive analysis excluding Ecuador, El Salvador, Panama. We also exclude the two years (2000 and 2001) of Argentina during which the Argentinean peso was linked to the US dollar with a currency board. In this set of

floaters five countries have been inflation targeters and 10 countries non IT arrangements. We computed annualised values of the variables of interest, taking monthly observations from the period 2000:01-2005:11.

To undertake the test of independence between the event "adopting the IT regime" and another variable such as "low rate of inflation", we follow these steps: a) build the probability distribution of the random variable, b) compute the quartile 1 and the percentile 10 of the distribution of the variable, c) define the variable in a dichotomy way, d) tabulate the two-dimensional observations of the two events using a two-entry table, and finally, e) calculate the χ^2 statistics. If this statistics generate significantly low p-values, then we may reject the null hypothesis of independency between the incumbent variables.

Low inflation and IT

Here we test the following independence hypotheses:

H_0: "Low rate of inflation" is independent of "Adoption of IT".

H_1: "Low rate of inflation" is not independent of "Adoption of IT".

We build first the probability distribution of the variable *Inf* (rate of inflation) using the whole set of observations for the 15 countries of the sample over the indicated period; then we calculate the quartile 1 and the percentile 10, and define the variable "low rate of inflation" under two forms A and B:

$$Low\ Inf(A) = \begin{cases} 1 & if \quad Inf_{i,t} \le Q_1(Inf) \\ 0 & EOC \end{cases} \tag{9}$$

$$Low\ Inf(B) = \begin{cases} 1 & if \quad Inf_{i,t} \le P_{10}(Inf) \\ 0 & EOC \end{cases} \tag{10}$$

The first definition is presented by (9). It establishes that, if the rate of inflation of country *i* and of period *t* ($Inf_{i,t}$) is smaller that the first quartile of the probability distribution of that variable, then the variable *Low Inf(A)* takes the value 1; in the opposite case, the variable takes the value 0. In other words, we characterise the case of low inflation as that in which the observed rates of inflation are within the interval that contains 25% of the observations with the lowest rates of inflation. The second definition, given by (10), is stricter than the first one, because it requires that all observations be smaller than percentile 10.

The tabulated values are reported in Table 8. The left part of the table presents the results for the first definition of low inflation, and the right part offers the results obtained using the second definition. The first column distinguishes between countries that have not adopted IT, to which we assign the value 0, and countries that operate with IT, to which we give the value 1.

As far the results for the first definition of low inflation are concerned, countries that have not adopted IT have 16% probability of having low inflation - against 84% for not having this outcome. On the contrary, for countries with IT the probabilities are 43% and 57%, respectively.

Table 8
Independence between "Adopting the IT regime" and "Low rate of inflation"
2000:01 – 2005:11

	Low inflation					
	Low Inf(A)			**Low Inf(B)**		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	569 84%	107 16%	676 100%	643 95%	33 5%	676 100%
(With IT) 1	204 57%	151 43%	355 100%	284 80%	71 20%	355 100%
Total	773	258	1031	927	104	1031
χ^2 *p-value*	**88.5** **0.00***			**58.7** **0.00***		

Q1 = 4.33% and P10 = 2.67%

As regards the second definition of low inflation, countries without IT report only 5% probability of having low inflation against the case of 20% probability in countries with IT. Consequently, under either definition of "Low inflation", it is apparent that the probability of having lower rates of inflation is unambiguously higher in countries with IT than in countries without IT.

Since the value of the χ^2 statistics enables us to reject (for both definitions of low inflation) the null hypothesis of independence, we accept that the event of "Low rate of inflation" is not independent of – or is related to - the event of "Adopting the IT scheme".

Low interest rate and IT

In this section we test the following hypothesis of independence:

H_0: "Low interest rate" is independent of "Adoption of IT".

H_1: "Low interest rate" is not independent of "Adoption of IT".

Following the same methodology as for the case of the rate of inflation, we use two alternative definitions of the random variable "Low interest rate":

$$Low\ IR(A) = \begin{cases} 1 & if \quad IR_{i,t} \leq Q_1(IR) \\ 0 & EOC \end{cases} \tag{13}$$

$$Low\ IR(B) = \begin{cases} 1 & if \quad IR_{i,t} \leq P_{10}(IR) \\ 0 & EOC \end{cases} \tag{14}$$

The tabulation of observations is presented in Table 9 with the same structure and meaning as Table 8. According to the first definition, in countries and periods where IT is not adopted, only 18% of observations have "Low interest rate", against 39% in countries and periods with IT. For the second definition, the probabilities are 5% and 21%, respectively. Consequently, the probability of having low interest rates is higher in countries that have adopted the IT regime.

Table 9
Independence between "Adopting the IT regime" and "Low interest rate"
2000:01 – 2005:11

	Low interest rate					
	Low IR(A)			**Low IR(B)**		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	557 82%	119 18%	676 100%	643 95%	33 5%	676 100%
(With IT) 1	215 61%	140 39%	355 100%	282 79%	73 21%	355 100%
Total	774	259	1031	925	106	1031
χ^2 *p-value*	**59.0** **0.00***			**62.0** **0.00***		

Q1 = 4.98% and P10 = 3.29%

The values of the χ^2 statistics, which are smaller than 1% in all cases, allow us to reject the null hypothesis of independence. We accept then that the events "Low interest rate" and "adoption of IT" are related.

Small change in the exchange rate

We test here the following hypothesis:

H_0: "Small change in the exchange rate" is independent of "Adoption of IT".

H_1: "Small change in the exchange rate" is not independent of "Adoption of IT".

We consider the two definitions of "Small change" that we used in the preceding cases.

The results of tabulation are reported in Table 10. The values presented in the left-hand side of the table correspond to the less strict definition of "Small change in the exchange rate". Using this definition, the probability for countries without IT of having small change in the exchange rate is 21%, against 32% for countries with IT. When the stricter definition is considered, the probabilities are 7% and 16%, respectively.

Table 10
Independence between "Adopting the IT regime" and "Small change in the exchange rate"
2000:01 – 2005:11

	Small exchange-rate change					
	Small ER ch(A)			**Small ER ch(B)**		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	532 79%	144 21%	676 100%	630 93%	46 7%	676 100%
(With IT) 1	242 68%	113 32%	355 100%	299 84%	56 16%	355 100%
Total	774	257	1031	929	102	1031
χ^2 *p-value*	**13.8** **0.00***			**21.0** **0.00***		

Q1 = 4.07% and P10 = 1.57

The very low values of the p-value statistics in both cases leads to a clear rejection of the null hypothesis and allow us to accept that there is a relationship between small rates of change of the exchange rate on the one hand, and the adoption of IT on the other.

At this point, it is interesting to ascertain whether the fact that Latin American countries with IT exhibit smooth fluctuations in the exchange rate is caused or not by frequent and/or intense interventions in the foreign exchange market, or by manipulation of domestic interest rates. For this purpose, we perform two types of statistical tests. The first one is a test of variance of international reserves, and the second is a test of independence between "Small variance of the interest rate" and "adoption of IT".

Test of variance of international reserves

In a first step, we calculate the rate of change of international reserves between two consecutive months (Ch RES) along the whole period (2000:01-2005:11). Reserves include all means of international payments excepting gold. As in the previous tests the group of non-IT is composed of countries which adopted some type of flexibility in the exchange rate without adhering to the IT regime.

In a second step, we compute the sample variations of the variable Ch RES for each group of countries, $\sigma^2_{RES}(IT)$ and $\sigma^2_{RES}(NIT)$, respectively.

The hypothesis to test is:

H_0: $\sigma^2_{RES}(IT) \geq \sigma^2_{RES}(NIT)$

H_1: $\sigma^2_{RES}(IT) < \sigma^2_{RES}(NIT)$

Or, in an equivalent way:

H_0: $\frac{\sigma^2_{RES}(IT)}{\sigma^2_{RES}(NIT)} \geq 1$

H_1: $\frac{\sigma^2_{RES}(IT)}{\sigma^2_{RES}(NIT)} < 1$

Assuming that the population distribution of the variable Ch RES fits a normal distribution in each group of countries, we perform our variance tests using the statistics of the variances ratio which adjusts to the left tail of a Snedecor F distribution. The results are summarised in Table 11.

Table 11
Tests of variance of international reserves
2000:01 – 2005:11

$\sigma^2_{RES}(IT)$	14.62
$\sigma^2_{RES}(NIT)$	77.65
F	0.19
p-value	(0.00)
$CI: \frac{\sigma^2_{RES}(IT)}{\sigma^2_{RES}(NIT)}$	0.16 - 0.23
$CI: \frac{\sigma^2_{RES}(NIT)}{\sigma^2_{RES}(IT)}$	4.42 – 6.31

The F statistics distributes with 355 and 676 degrees of freedom in the numerator and denominator, respectively.

It is apparent that the values of the p-value statistics allow us to reject the null hypothesis. It follows then that international reserves exhibit lower volatility in IT countries than in countries without IT. The 95% confidence intervals indicate that the variability of international reserves in countries NIT multiplies that of IT countries by a factor between 4.4 and 6.3.

Low variability in the domestic interest rate

Let us test the null hypothesis of independence between "Small variance of the nominal interest rate" and "Adoption of IT", and consider two definitions of "Small variance" in the same statistical way as in the preceding tests. The sample begins in 2000:12 because since variances are calculated on annual basis, the first results correspond to the last month of the year 2000.

The results tabulated in Table 12 show that, taking the first definition of interest-rate variability, countries without IT exhibit small variability in 22% of the observed cases, whereas in countries with IT the probability for this result is 31 %. The results obtained with the second definition of interest-rate variability are not statistically significant, as the p-value does not achieve a sufficiently low value. The conclusion of this test is that the probability of having low variability and adopting the IT regime are not independent events.

The results of the last two tests indicate that countries with IT do not interfere more than countries without IT in the value of their nominal exchange rate. This is true for either of the main weapons they use to implement intervention: buying and selling international reserves in the foreign exchange market, and modifying the domestic

interest rate. This finding indicates that "fear of floating" is not more intense or frequent in IT countries than in other non-IT countries with flexible exchange rates.

Table 12
Independence between "Adopting the IT regime" and "Low variability in the interest rate"
2000:12 – 2005:11

	Low interest rate variability					
	Low IR VAR (A)			Low IR VAR (B)		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	443 78%	124 22%	567 100%	514 91%	53 9%	567 100%
(With IT) 1	208 69%	92 31%	300 100%	266 89%	34 11%	300 100%
Total	651	216	867	780	87	867
χ^2 *p-value*	**8.1** **0.00***			**0.86** **0.34***		

Q1 = 0.13% and P10 = 0.018

Table 13
Independence between "Adopting the IT regime" and "Small variability in the inflation rate"
2000:12 – 2005:11

	Small inflation variability					
	Low Inf VAR (A)			Low Inf VAR (B)		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	478 84%	89 16%	567 100%	531 94%	36 6%	567 100%
(With IT) 1	175 58%	125 42%	300 100%	245 82%	55 18%	300 100%
Total	653	214	867	776	91	867
χ^2 *p-value*	**72.1** **0.00***			**29.9** **0.00***		

Q1 = 0.31% and P10 = 0.17%

Low variability of the inflation rate

Let us now test the null hypothesis of independence between "Small variance of the inflation rate" and "Adopting an IT regime", and consider the two definitions of small variance explained in the former statistical tests.

The results, presented in Table 13, indicate that small variability in the inflation rate more frequently corresponds to countries that adopt IT than to countries without IT. The probabilities are in fact, 42% and 16%, respectively when we adopt the first definition of small variability, and 18% and 6%, respectively, when we use the second definition of small variability.

Small output variability

In this test, domestic output is proxied by the annualised industrial production index (IPI), which is available on a monthly basis. The sample only includes the countries that report regular IPI data, which are the five IT countries plus Argentina, Costa Rica, Guatemala, Nicaragua and Venezuela. For this reason, the number of observations used in this empirical analysis is lower than in the tests presented above. The results for the test of independence between "Adopting IT" and "Small output variability", considering the two habitual definitions of small variability, are reported in Table 14. As can be seen, the IT regime guarantees smaller variability in output than non-IT, for each of the two definitions. The probabilities are 34% and 15%, respectively, with the first definition, and 16% and 3%, respectively, with the second definition.

Table 14
Independence between "Adopting the IT regime" and "Small output variability"
2000:12 – 2005:11

	Small output variability					
	Low IPI VAR (A)			**Low IPI VAR (B)**		
Inflation Targeting	**(Without) 0**	**(With) 1**	**Total**	**(Without) 0**	**(With) 1**	**Total**
(Without IT) 0	221 85%	40 15%	261 100%	254 97%	7 3%	261 100%
(With IT) 1	199 66%	101 34%	300 100%	251 84%	49 16%	300 100%
Total	420	141	561	505	56	561
χ^2 *p-value*	**25.0** **0.00***			**29.0** **0.00***		

Q1= 0.66% and P10 = 0.24%
1. Variability of output is obtained by calculating the variance of the annualised industrial production index, using a window of size 12.
2. The group of non-targeter countries (Without IT) only includes Argentina, Costa Rica, Guatemala, Nicaragua, Venezuela.

We also performed the same test using an enlarged group of non-IT countries in which we include the hard pegs Ecuador, Panama, El Salvador, and the period 2000:01-2001:12 of Argentina. For the two definitions of small variance we obtained results that are in the same line as those of Table 13, but rejection of the null is not so strong because the χ^2 statistics are considerably lower.

GDP growth

In this section we estimate a model of treatment effects to analyse to what extent the adoption of the IT regime affects economic growth. We apply the two-step model suggested by Heckman (1979), Maddala (1983) and Greene (2003). The method consists of estimating two equations: a treatment equation (probit) in a first step and an outcome equation in a second step. The nature of this test requires using quarterly data for the variables of interest. However, since data with this frequency are not available everywhere, the analysis is confined to a sub-sample of countries that do report the appropriate information over the whole period. The countries are: the five IT economies plus Argentina, Bolivia, Costa Rica, Ecuador, Dominican Republic, Uruguay and Venezuela.

Table 15
Economic growth and adoption of Inflation Targeting
2000:I – 2005:III

Treatment variable: Adoption of the inflation target strategy (IT)		
Variable	**Coefficient**	**p-value**
C	-0.31496	0.55180
INT	6.56303	0.00030*
EDEBT	-18.97735	0.00040*
CA	-12.33283	0.00010*
RES	39.18623	0.00000*
Outcome variable: rate of GDP growth		
Variable	**Coefficient**	**p-value**
C	-7.0909	0.031166**
OP	3.3938	0.037988**
G	5.5775	0.569462
GFFK	27.3564	0.000127*
GDP_0	2.4526	0.366910
IT	-0.5315	0.000722*
HAZ	0.4092	0.020348**
ω	4.3700	
ρ	0.1000	

Level of significance: (*): 1%; (**): 5%

The *probit* estimation with cross-section observations seeks to determine the extent to which some variables proposed in the empirical literature dealing with this issue affect the probability of adopting the IT regime. We consider the following potential determinants: a) the amount of interest payments on foreign debt (INT), b) the stock of public external debt (EDEBT), c) the current account balance (CA) d) the stock of international reserves (RES).

The estimation of an outcome equation is intended to assess the influence of several variables in economic growth. Our candidates are: a) international openness OP), b) government expenditures (G), c) gross formation of fixed capital (GFFK), d) the initial level of GDP per capita (GDP_0), e) adoption of inflation targeting regime (IT). In order to solve the inconsistency problems, in this step we include a hazard variable (HAZ) in the regression. The results of both estimations are reported in Table 16.

As far as the estimation of treatment effects is concerned, it seems that the countries with the highest probability of adopting IT are those that: a) pay high amounts of interests on external debt; b) have a low stock of external public debt; compatibility with the first determinant occurs when the bulk of interest payments correspond to private debt; c) run current account deficits, and d) have high stocks of international reserves

As regards the estimation of the outcome equation, the results presented in the lower part of Table 16 indicate that economic growth is favoured by: a) international openness, b) gross formation of fixed capital, and c) adoption of IT.

The effects of factors a) and b) on GDP growth have been extensively demonstrated in the empirical literature on economic growth. To our knowledge, our analysis provides the first empirical proof that in emerging market countries the adoption of IT affects the rate of economic growth of these countries positively.

Summarising the main findings of our empirical analysis, using monthly data from a group o LA countries during the period 2000-2005, it seems clear that the adoption of IT is directly related to the probability of having: i) relatively low rate of inflation, ii) low levels of domestic interest rates, iii) low variations in the nominal exchange rates, iv) relatively low variability in several macroeconomic variables such as the stock of international reserves, the interest rate, the rate of inflation and domestic output; v) higher rates of GDP growth.

4. Concluding remarks

In this paper we have analysed the extent to which inflation targeting has improved macroeconomic performance in a group of Latin American countries over the last six years. In the theoretical part of the paper we built a model to show that the flexible version of this regime enables the monetary authorities to pursue other legitimate goals of macroeconomic policy such as stabilisation of production.

The optimal values of four endogenous variables are derived as effective responses to each type of shock. Looking at the responses of domestic output and real interest rate, we find that monetary policy may be pro-cyclical or counter-cyclical, depending on the nature of external shocks. It turns out that pro-cyclical movements in the real interest rate are optimal policy responses when the underlying shocks are variations in a) the foreign potential output; b) domestic supply shocks; c) variations in the foreign interest rates; d) changes in the country risk premium.

With the help of our theoretical framework we clarify some issues of the debate on "fear of floating" in emerging market economies. Thus, we confirm the findings of Gallego and Jones (2005) by showing that fear of floating is the optimal policy for EMC in "good" times since it avoids the negative effects of excessive exchange rate volatility on inflation and corporate balance sheets. However, in a "bad" state, the best exchange rate strategy is floating with full commitment of the authorities because it improves insurance for the private sector against potential sudden stops. In the absence of credibility and commitment, fear of floating is unavoidable and inefficient in a "bad" state, and inflicts the negative results argued by Calvo and Reinhart (2002) and other supporters of hard pegs for EMCs.

In the empirical part of the paper we show that IT in the countries of our sample is linked to improvements in macroeconomic stability in the short term and economic growth in the medium term. The last result is compatible with the findings of Edwards and Levy Yeyati (2003) related to the virtues of flexible exchange rates as shock absorbers. They found, indeed, that flexible exchange rate arrangements help reduce the real impact of terms of trade shocks on GDP growth. We go one step further by showing that, among the group of countries that have flexible exchange rates IT provides a bonus in economic growth.

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