

Inflation targeting in emerging economies: What do the data say?

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Abstract

In a recent thought-provoking paper, Ball and Sheridan [Ball, L., Sheridan, N., 2005. Does inflation targeting matter? In: Bernanke, B.S., Woodford, M. (Eds.), *The Inflation-Targeting Debate*, University of Chicago Press] show that the available evidence for a group of developed economies does not lend credence to the belief that adopting an inflation targeting regime (IT) was instrumental in bringing inflation and inflation volatility down. Here, we extend Ball and Sheridan's analysis for a subset of 36 emerging market economies and find that, for them, the story is quite different. Compared to non-targeters, developing countries adopting the IT regime not only experienced greater drops in inflation, but also in growth volatility, thus corroborating the view that the regime's "constrained flexibility" to deal with adverse shocks delivered concrete welfare gains.

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1. Introduction

In the last 15 years, some developed and developing countries opted to follow in New Zealand's footsteps and implemented the now famous Inflation Targeting framework for managing monetary policy. Since then, numerous researchers (Bernanke and Mishkin, 1997; Svensson, 1997; Bernanke et al., 1999), as well as practitioners in central banks worldwide, have claimed that the potential benefits to be reaped from the adoption of an IT regime are considerable. Some of the alleged gains are lower and less variable inflation and interest rates, more stable growth and enhanced ability to respond to shocks without losing credibility.

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This optimistic assessment is, however, at odds with available empirical evidence. As Ball and Sheridan (2005) show in a recent thought-provoking paper, adopting IT appears to have been irrelevant for a group of 20 OECD developed economies, entailing neither gains nor losses in terms of economic performance. Among other things, their results indicate that the greater reduction in average inflation and inflation variability observed in “targeters” vis-à-vis “nontargeters” vanishes once one controls for mean reversion. The bigger drop in inflation for those economies that moved to inflation targeting systems, they argue, follows simply from the fact that these same countries displayed higher initial inflation and there is a tendency for this variable to revert to its mean.

But, because their paper focused solely on developed economies, these results, somewhat baffling at first sight, may be plagued with a kind of “selection bias” problem. In fact, it is not really surprising that the adoption of IT by a developed economy did not deliver important economic gains since these countries were not suffering from severe inflation problems or other destabilizing macroeconomic disturbances to begin with. Therefore, it is entirely possible that while IT has not brought the heralded good results for developed economies, it may have enhanced macroeconomic performance among developing countries, which are undoubtedly hit by larger shocks and face greater difficulties in designing sound domestic macroeconomic policies.²

In this article, we carefully explore this appealing conjecture and apply Ball and Sheridan’s idea of comparing countries’ economic performances (using a “difs-in-difs” estimation) to a group of 36 emerging economies, 13 of which have opted for the inflation targeting framework. Summing up the results, we find that, within these groups, those that adopted IT experienced greater reductions in inflation and GDP growth variability, even after controlling for mean reversion. In short, IT did matter for them.

2. Data and methodology

As mentioned above, our data set includes 36 emerging economies (13 of which implemented the IT regime)³ and spans from 1980 to 2005. Using the kind of difs-in-difs strategy employed by Ball and Sheridan (2005), we investigate whether changes in average inflation, inflation variability and growth volatility were greater in targeters when compared to non-targeters.

Before proceeding, it is important to emphasize that it does not suffice to check whether the observed changes in these economic variables between two distinct periods were bigger for those who chose to inflation target. The reason for this caveat is that if initial inflation was higher within this group, a more significant reduction in the level of this variable may simply reflect mean reversion and not a direct contribution of the IT regime. To control for this potential problem, we add the initial value of the dependent variable as a right-hand side regressor. We therefore run our “difs-in-difs” regressions based on the following general specification:

$$\Delta x^i = c + \beta \cdot x^i + \alpha \cdot D + \varepsilon \quad (1)$$

Where:

$\Delta x^i = x_F^i - x_I^i$, x_F^i is the “final” period (to be defined below) value of an economic variable i ;
 x_I^i is the “initial” period (to be defined below) value of an economic variable i ;

² Ball and Sheridan raise this possibility when concluding their paper.

³ The inflation targeters in the sample are: Brazil, Chile, Colombia, Czech Republic, Hungary, Israel, Mexico, Peru, Philippines, Poland, South Africa, South Korea and Thailand. The group of non-targeters is comprised by Argentina, Bulgaria, China, Costa Rica, Côte d’Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, India, Indonesia, Lebanon, Malaysia, Morocco, Nigeria, Pakistan, Panama, Tunisia, Turkey, Uruguay, Venezuela, Singapore and Taiwan.

- c is a simple constant and;
 D is a *dummy* variable equal to 1 when the country inflation targets, and 0 otherwise;
 i takes values of average inflation, inflation volatility (standard deviation), and growth variability (standard deviation);
 ε is an error term.

The idea here is fairly simple: to assess whether having adopted the Inflation Targeting framework made any difference in terms of economic performance using the non-targeters as a

Table 1
Inflation data^a

Country	Adoption year	Initial inflation	Final inflation	Fall
Brazil	1999	8,7	7,9	-0,8
Chile	1991	21,8	7,2	-14,6
Colombia	2000	22,8	6,9	-15,9
Czech Republic	1998	3,8	3,5	-0,3
Hungary	2001	15,3	5,9	-9,4
Israel	1992	17,2	6,1	-11,1
Mexico	1999	21,8	7,2	-14,6
Peru	1994	48,6	6,6	-42,0
Philippines	2002	11,3	5,0	-6,3
Poland	1999	22,8	4,5	-18,3
South Africa	2000	12,3	5,2	-7,1
Thailand	2000	5,4	2,2	-3,3
South Korea	1998	7,4	3,4	-4,0
Targeters mean	1998	17	5,5	-11,4
Argentina	–	7.3	6.4	-0.9
Bulgaria	–	4.5	7.3	2.8
China	–	8.6	0.6	-8.0
Costa Rica	–	19.3	11.0	-8.3
Côte d'Ivoire	–	6.3	3.0	-3.3
Dominican Republic	–	17.9	9.2	-8.7
Ecuador	–	30.2	16.6	-13.7
Egypt	–	15.3	5.1	-10.2
El Salvador	–	16.0	2.7	-13.3
India	–	9.4	5.2	-4.2
Indonesia	–	9.0	10.2	-1.2
Lebanon	–	14.6	1.3	-13.4
Malaysia	–	3.6	2.3	-1.4
Morocco	–	6.5	1.6	-4.9
Nigeria	–	18.5	12.8	-5.8
Pakistan	–	8.9	5.1	-3.8
Panama	–	2.3	1.1	-1.2
Tunisia	–	7.2	2.7	-4.5
Turkey	–	37.9	21.7	-16.2
Uruguay	–	33.9	9.4	-24.5
Venezuela	–	24.3	22.4	-1.9
Singapore	–	2.6	0.5	-2.1
Taiwan	–	4.1	0.8	-3.2
Non-targeters' mean	–	13,4	6,9	-6,5

^a Here we report only one "initial period", i.e., that beginning in 1980.

Table 2
Inflation regressions

Dependent variable: Fall in inflation			
Controls	Model 1 (beginning of initial period: 1980)	Model 2 (beginning of initial period: 1985)	Model 3 (beginning of initial period: 1990)
<i>C</i>	2.56 (0.0681)	50 (0.0523)	2.33 (0.0516)
IT dummy	−2.53 (0.0607)	−2.48 (0.0569)	−1.99 (0.0995)
Initial inflation	−0.67 (0.0000)	−0.67 (0.0000)	−0.71 (0.0000)
<i>R</i> ²	0,79	0,82	0,86

White heteroskedasticity-consistent standard errors.

p-values in parentheses.

“control group”. In other words, we are interested in the economic and statistical significance of the parameters α , after controlling for mean reversion (we expect the β s to be of negative sign).

We employ annual inflation and GDP growth rates from the IMF’s World Economic Outlook. Note that the estimation strategy makes it necessary to define a dividing line between what we call the “initial” and “final” periods. Whereas defining the date demarcating the partition between the end of the initial period (I) and the beginning of the final period (F) is straightforward for the inflation targeting countries (it is simply the year a given country adopted the regime if the adoption happens in the first 6 months of that year, or the following year otherwise⁴), this process involves an unavoidable degree of arbitrariness when it comes to the non-targeters group. In this regard, we again follow Ball and Sheridan’s suggestion and use the average date of adoption for the targeters group, 1998, as our dividing line for the non-targeters.⁵

For robustness, we experiment with three different “initial” periods. All of them end when the country adopts the IT arrangement (or, in the case of the non-targeters, in 1998), and what varies is the date chosen as the beginning of the period: we conduct these tests with 1980, 1985 and 1990.⁶

A potential problem of major importance when studying changes in inflation in a group of emerging economies is the presence of hyperinflation. Many countries in Latin America, for instance, experienced extremely high inflation rates until the mid-nineties. This could potentially contaminate our estimations. For example, if a disproportionate number of targeters suffered from too high inflation in the past,⁷ the huge drops in inflation from the initial to the final period in these countries would “artificially” inflate the significance of the IT dummy variable.⁸ To avoid the contamination of our results by the incidence of hyperinflations, we calculate the averages of our economic variables excluding the years when inflation was above a 50% threshold. We chose to eliminate only the high inflation years instead of discarding all of the data from any given country

⁴ The adoption dates of the IT framework by the countries in our data set were based on Fraga et al. (2003).

⁵ In the traditional “difs-in-difs” estimations, the first and second periods are exactly the same for the control and treatment groups. Hence, the application of this method here is to some extent casual. As one referee pointed out, assuming as counterfactuals an average of all IT dates introduces some symmetry, though. The reason is that biases imposed by fixing a date earlier than that of the IT implementation date for certain countries would be compensated by biases of a different sign for those countries when the average is later than their application.

⁶ We also ran the same regressions using 1997 and 1999 as the years demarcating the end of the initial period. These changes did not substantially affect our results.

⁷ For instance, Brazil, the country most hardly hit by hyperinflation in our sample, eventually turned to IT.

⁸ Moreover, in general, since the dynamics of hyperinflations are quite different from those of moderate inflations, researchers usually treat both as very distinct phenomena.

that experienced such troubles for one practical reason: too many economies in our sample had at least one year of very high inflation. If we were to eliminate all countries having gone through at least one year of hyperinflation, we would have to discard 16 out of 36 economies in our data set.

3. Results

In this section we present the main results of the paper, namely, that emerging economies adopting the IT regime saw more significant reductions in average inflation and growth volatility than those that selected alternative frameworks to conduct their monetary policies.

Table 3
GDP growth volatility data

Country	Adoption year	Initial growth volatility	Final growth volatility	Fall
Brazil	1999	4.0	1,7	-2.2
Chile	1991	6.7	3,3	-3.4
Colombia	2000	2.3	1,5	-0.8
Czech Republic	1998	3.5	2,2	-1.3
Hungary	2001	3.8	0,5	-3.3
Israel	1992	1.9	2,9	1.0
Mexico	1999	4.0	2,3	-1.7
Peru	1994	7.4	3,8	-3.6
Philippines	2002	3.8	0,7	-3.1
Poland	1999	5.4	1,6	-3.9
South Africa	2000	2.5	0,9	-1.7
Thailand	2000	5.1	1,7	-3.5
South Korea	1998	3.0	5,1	2.1
Targeters' mean	1998	4,1	2,2	-2,0
Argentina	-	5.7	7.5	1.8
Bulgaria	-	6.2	1.1	-5.1
China	-	3.4	1.1	-2.3
Costa Rica	-	3.9	2.8	-1.1
Côte d'Ivoire	-	3.8	2.5	-1.4
Dominican Republic	-	3.8	3.8	-0.1
Ecuador	-	3.4	3.9	0.4
Egypt	-	2.3	1.6	-0.7
El Salvador	-	4.6	0.8	-3.8
India	-	1.6	1.6	0.0
Indonesia	-	2.0	6.3	4.3
Lebanon	-	23.0	2.4	-20.7
Malaysia	-	3.0	5.1	2.1
Morocco	-	5.7	2.7	-3.0
Nigeria	-	5.9	3.5	-2.4
Pakistan	-	1.5	1.8	0.3
Panama	-	5.6	2.5	-3.1
Tunisia	-	2.8	1.4	-1.4
Turkey	-	4.0	6.2	2.3
Uruguay	-	4.6	7.1	2.5
Venezuela	-	4.7	9.2	4.5
Singapore	-	3.3	4.5	1.2
Taiwan	-	2.3	2.7	0.4
Non-targeters' mean	-	4,7	3,6	-1,1

Table 4
GDP volatility regressions

Dependent variable: Fall in GDP volatility			
Controls	Model 1 (beginning of initial period: 1980)	Model 2 (beginning of initial period: 1985)	Model 3 (beginning of initial period: 1990)
C	3.61 (0.0000)	3.56 (0.0000)	3.59 (0.0000)
IT dummy	-1.41 (0.0296)	-1.40 (0.0305)	-1.57 (0.0215)
Initial volatility	-1.00 (0.0000)	-1.00 (0.0000)	-1.01 (0.0000)
R ²	0,76	0,73	0,63

White heteroskedasticity-consistent standard errors.

p-values in parentheses.

As Table 1 shows, average inflation actually fell by a larger amount in countries adopting the IT regime. However, as Ball and Sheridan warn us, one has to beware of the possibility of simple mean reversion since inflation was initially higher in the countries belonging to the IT group.

Nevertheless, the results presented in Table 2 show that, even after controlling for mean reversion, inflation fell more in the targeters group. The dummy variable in the inflation regressions is of negative sign, as suggested by the initial conjecture, and has *p*-values of 6%, 5% and 10%, depending on the initial period under consideration.⁹ Moreover, judging by the size of the point estimates we found (-2.53%, -2.48%, -1.99%), the additional inflation reduction experienced by those adopting IT was not at all immaterial.¹⁰

When we substitute inflation volatility for inflation in our regressions, we find no strong evidence that adopting IT made any difference (results not reported). The dummy variable has the “correct” negative sign, but is never significant at 10%.

Moving to growth volatility, Table 3 already hints that the greater reduction in this variable in the targeters group cannot be due to mean reversion simply because the targeters’ initial growth volatility was indeed lower than the non-targeters’ initial volatility. As expected, in Table 4 the IT dummy appears with negative sign and is highly significant in all three regressions. Furthermore, the extra fall in growth volatility in the targeters group (around 1.5 percentage points) looks huge, lending support to IT’s advocates, claims that the system is better able to cope with adverse shocks.

Finally, since in the “aggregate” both groups do not seem to display any major characteristic that markedly differentiates them besides their distinct choices about monetary policy arrangements, it is indeed plausible to conclude that the adoption of the IT regime did help to bring inflation and growth volatility to lower levels in emerging economies.¹¹

4. Concluding remarks

In this short paper, we reproduced Ball and Sheridan’s (2005) analysis using data for 36 developing economies, 13 of which have implemented the inflation targeting framework.

⁹ Although our *p*-values are not below the 5% threshold, it is important to remember that we are working with a small sample of countries.

¹⁰ Specially after one realizes that the actual difference in the average inflation declines between groups is of 5%.

¹¹ One may argue that the fall in growth volatility was actually due to the simultaneous adoption of a floating exchange rate regime by the countries choosing to inflation target. But this does not seem to be the case. From the 13 targeters in our sample, only Brazil and Thailand implemented the IT regime shortly after the demise of a currency peg. Further, South Korea, one of our targeters, is more properly described as having a fixed exchange rate regime!

Our results suggest that the choice of the IT regime proved beneficial for emerging economies. In particular, we find that: (i) the greater fall in inflation experienced by emerging market targeters can, to some extent, be attributed to the regime itself and not only to mean reversion; (ii) those choosing to inflation target saw a greater reduction in growth volatility than those opting for alternative monetary policy arrangements (lending some credence to the often asserted “flexibility to cope with shocks” characteristic of the regime). Moreover, the often heard claim that Inflation Targeting regimes hinder economic growth is clearly not sustained by the empirical evidence. In sum, the data so far suggests that the adoption of IT by emerging economies did contribute towards the attainment of superior outcomes in terms of economic performance.

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