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Further Examination of Inflation Targeting Policies in Developing Economies: A Regional Perspective *

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Abstract

Over the last few decades several countries have turned to inflation targeting as a policy choice for instilling stability into their economies. Prior studies have shown that inflation targeting has reduced inflation in those countries without significantly impacting GDP. This study seeks to improve upon these results by identifying the impact of timing on the policy decision as well as its impact as related to specific regions of the world. The focus is on developing countries. We find significant regional variation in developing countries in our sample in terms of the direction of changes in inflation following a switch to the inflation targeting policy. Moreover, although the impact of inflation targeting on real GDP is minimal overall, there is a statistically significant increase in real GDP among developing countries in certain regions only, namely, Europe, Latin America, and the Middle East.

JEL Classification: E31, E32, E52, F33, O5
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Introduction

Inflation targeting is not without its critics. It has been argued that inflation targeting has several disadvantages including the following: (1) Decreased discretion by the central bank that leads to declines in output growth; (2) Too much discretion that results in the inability to influence inflation expectations; (3) Higher exchange rate volatility as inflation targeting ignores exchange rate levels; (4) Inability of inflation targeting to be successful in countries that do not meet strict preconditions.[1]

Following the most recent methodology put into place by Brito and Bystedt (2010) and applying this methodology to a large sample of developing countries, the purpose of this study is to explore the effectiveness of inflation targeting on inflation and output growth. We extend previous literature by using a large sample of developing countries including the addition of several more recent inflation targeters. Additionally, unlike previous studies, we examine the effects of inflation targeting on different regions in order to capture regional effects following evidence from Brito and Bystedt (2006) that there are regional specific effects. Being able to assess how inflation targeting affects different regions individually is critical to understanding the effects of inflation targeting.

Background

Inflation targeting is defined as a monetary policy that encompasses five main elements. Those countries that inflation target do the following: (1) publicly announce a medium-term numerical target for inflation; (2) have an institutional commitment to price stability as the primary goal of monetary policy to which other goals are subordinate; (3) have an information inclusive strategy in which many variables are used for deciding the setting of policy

[1] For further information, see, among others, Batini and Laxton (2006).

instruments; (4) have increased transparency of monetary policy transparency through communication with public and the markets about the plans, objectives, and decisions of monetary authorities; and (5) have increased accountability of the central bank for obtaining its inflation objectives.[2]

There are currently twenty-two countries that explicitly follow an inflation targeting policy, including fourteen developing countries and eight industrial countries, spanning the entire world.[3] Within this group of countries, there are countries of varying degrees of economic development, ranging from the most industrialized countries to those countries that are still developing. The group of inflation-targeting developing countries, furthermore, is heterogeneous and the level of economic development varies drastically from one country to the next. These developing countries vary in terms of their economic practices utilized and their level of institutional development.

The results and presumed success of inflation targeting in general is still a controversial topic and varies depending on the economic development status of the country. Much work has been done examining the industrial countries, and there are many studies that have shown favorable results for the industrial inflation targeters.[4] For example, a study done by Mishkin and Schmidt-Hebbel (2007) of twenty-one industrial and emerging country targeters utilizes OLS and IV estimation to show that inflation targeters experience decreases in inflation levels both in the short run and the long run. The authors check the robustness of their results by specifying different control groups and time periods. For example, in this study, inflation targeters are further divided into converging-target and stationary target inflation targeters.

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[2] For further information, see Mishkin (2004).
[3] Numbers as of 2010 from central banks' websites.
[4] For example, see Mishkin and Schmidt-Hebbel (2006), Neumann and Von Hagen (2002), and Natalucci, Levin, and Piger (2006).

Studying a sample of six industrial IT countries and three non-IT countries, Neumann and Von Hagen (2002) are able to show that IT matters when it comes to lowering inflation rates and curbing the volatility of inflation and interest rates. Neumann and Von Hagen (2002) accomplish this by using a variety of methods including dividing their sample into pre- and post-inflation targeting periods, using the method of double differences, estimating Taylor rules and unrestricted VARs, and conducting an event study. In criticism of Neumann and Von Hagen, the authors use a limited sample of countries in their study.

Utilizing a univariate autoregressive process for each inflation rate, Natalucci, Levin, and Piger (2004) are able to show that inflation targeting has been useful in anchoring inflation expectations and reducing inflation persistence in a group of inflation targeters. In criticism of this article, the authors fail to enact certain measures to ensure that the non-targeting sample closely resembles the inflation targeting sample. The problem with their study is that the sample of inflation targeters is comprised of small, open economies while their non-targeting sample is comprised of larger, closed economies. The inherent differences in these countries could help to explain the differences in inflation performance.

There are a group of studies, however, that have shown that inflation targeting does not lead to as many improvements as once claimed.[5] For example, Ball and Sheridan (2005) utilized a difference-in-difference approach to a sample of OECD countries and showed that once one controls for a regression to the mean, there is no significant evidence that inflation targeting has been successful. In fact, Ball and Sheridan (2005) found that inflation targeters, on average, showed no improvement in terms of output, inflation, or interest rates over countries that chose to pursue other monetary policies. In criticism of Ball and Sheridan (2005), the methodology imposed in their study fails to control for endogeneity and self-selection bias. The choice of a

[5] See Ball and Sheridan (2003, 2005), Cecchetti and Ehrmann (2000), and Angeriz and Arestis (2006).

central bank to inflation-target is an endogenous choice and is taken at different times by different countries. Their methodology, however, fails to correct for this via accounting for country-specific fixed effects and time effects.

Using intervention analysis and modeling inflation by using seemingly unrelated time series equations, Angeriz and Arestis (2006) show that inflation targeters do not experience as many gains in terms of inflation levels as once claimed. Studying a sample of ten inflation targeters the authors are able to show that the choice to inflation target was adopted in these countries after they were already able to gain control over inflation levels. Therefore, the choice of inflation targeting was enacted already after the country had taken other measures to control inflation levels.

Developing countries by nature are a unique and diverse group. For this reason, the findings regarding the effectiveness of inflation-targeting in developing countries vary drastically. Studies have shown that there are certain characteristics that developing countries have that make the implementation and success of inflation targeting harder to ensue. However, arguments can be made that developing countries, specifically, experience the most advantages from inflation-targeting because it forces the countries to set and achieve a desired target, leading to levels of transparency and communication which are initially lacking in developing countries.[6] For this reason, there is mixed evidence as to the effectiveness of inflation-targeting in developing economies. A summary of earlier findings can be seen in the table below:

[6] For reference, see Mishkin (2004).

Author	Methodology	Time Span	Frequency	Size of Sample	Impact on inflation (Sign of Variable)	Impact on GDP (Sign of Variable)	R-Squared of GDP regressions
Angeriz and Arestis (2006)	SURE	1980-2004	Quarterly	10 IT	No impact	-	-
Ball and Sheridan (2005)	Diff-in-Diff	1960-2000	Quarterly	7 IT, 13 Non-IT	Weak negative impact	Weak positive effect	.02-.23 depending on sample
Batini and Laxton (2007)	Diff-in-Diff	1985-2004	Quarterly	31 countries, 21 IT, 10 non-IT	Strong negative impact	-	-
Brito and Bystedt (2006)	Diff-in-Diff	1994-2005	Quarterly	5 IT, 8 non-IT	Strong negative impact	Strong positive effect	.12 and .28
Brito and Bystedt (2010)	OLS, FE	1980-2006	3 year periods	13 IT, 33 non-IT	Weak negative impact	Weak negative effect	.15, .18, .20
Goncalves and Salles (2008)	Diff-in-Diff	1980-2005	Annual	13 IT, 23, non-IT	Strong negative impact	-	-
Lin and Ye (2009)	Probit Propensity Scores	1985-2005	Annual	52 countries, 13 IT	Strong negative impact	-	-
Mishkin and Schmidt-Hebbel (2007)	OLS, IV	1989-2004	Quarterly	13 non-IT, 21 IT	Negative impact	-	-
Natlucci, Levin, and Piger (2004)	impulse responses	1994-2003	Quarterly	5 IT, 7 non-IT	Reduces inflation persistence	-	-
Neumann and von Hagen (2002)	VARs, impulse responses	1978-2001	Monthly, Quarterly	7 IT, 3 non-IT	Significant negative impact	-	-

There is an existing group of literature that shows that within the sample of developing countries, those that inflation-target will experience the greatest drops in inflation levels and output volatility.[7] For example, Batini and Laxton (2006) utilized a difference-in-difference estimation to show that inflation-targeting has favorable results in emerging market economies. The results of this study showed that inflation-targeting brought about improvements in inflation and inflation-expectations with no adverse effects to output. However, they only utilized a limited time span, and since many of the inflation-targeting countries implemented inflation-

[7] For example, see Goncalves and Salles (2006) and Batini and Laxton (2006).

targeting at the end of the time span studied, the post-time frame was very short. Therefore no long run implications could be ascertained.

Brito and Bystedt (2006) utilized difference-in-difference methodology to show that for countries in Latin America, inflation targeting is a successful monetary policy. Their results showed that Latin American inflation targeters experienced decreases in inflation levels and inflation volatility in addition to the sensitivity of expected inflation to actual inflation without reducing output growth. The authors use regressions to measure the future expected inflation in the country as being dependent on a three-year moving average of inflation. The credibility of a country to meet its objectives can be measured by inflation expectations. According to Brito and Bystedt (2006), successful inflation-targeting countries are expected to show declines in actual and expected inflation. In their study, the authors are able to show that inflation expectations become less sensitive to actual inflation under inflation-targeting regimes, showing that inflation targeting is successful when it comes to Latin American countries. In criticism of their work, the authors failed to perform robustness checks by dropping periods of hyperinflation. Many countries in this study have experienced periods of hyperinflation and this could bias the results.

However, other studies have shown no evidence that inflation-targeting makes any improvements. Brito and Bystedt (2010) extend their research by including a unified sample of those thirteen inflation-targeting countries studied by Goncalves and Salles (2006) and Batini and Laxton (2006) and forty-six non-targeting countries. The authors show that there is no evidence that inflation-targeting improves performance as evidenced by both inflation and output growth. Additionally, the authors are able to show there is lower output growth during inflation targeting adoption.[8]

[8] For further study, see Brito and Bystedt (2010).

The results achieved by Brito and Bystedt (2006) as compared to those obtained later in 2010 by these authors indicate the need for regional specific studies and are a motivating factor for including regional dummies in our study. As previously illustrated, they are able to show that when it comes to Latin America, inflation targeters are able to lower inflation levels and inflation volatility. Yet, when the authors study inflation targeters as a whole, as was done in Brito and Bystedt (2010), they are able to show that successes are not as great as once were thought. This result illustrates the need for regional specific study. By including regional dummies, we hope to reconcile the differences experienced by these authors.

Methodology

Our goal is two-fold. First, we expand upon the existing inflation targeting framework to identify any regional differences in inflation targeting policy. Second, we identify the direct impact of inflation targeting on real economic growth by keying in on the length of time in which an inflation targeting regime change will need before positive and substantive growth is garnered. To begin with, we utilize the base framework set up by Brito and Bystedt (2010), that is, an OLS model regressing the rate of inflation on inflation targeting, previous term of inflation, as well as a dummy variable capturing high inflation, as seen in equation (1):

$$\pi_{it} = \beta_0 + \beta_1 IT_{it} + \beta_2 \pi_{it-1} + \beta_3 \pi_{it}^{H} + u_{it} \tag{1}$$

With respect to our data, the high inflation dummy takes a value of 1 if that inflation rate is more than four standard deviations above the mean. Otherwise it takes a value of 0.[9] As with Brito and Bystedt (2010), we further augment this model with a time-measure dummy variable and then run it both in OLS and in a fixed effects framework, with the latter utilizing a robust standard error correction. We expect to see results similar to Brito and Bystedt (2010), namely that inflation targeting is an effective tool in reducing inflation. Next, we run the complete series of models a second time, but this time accounting for regional differentiation. In equation (2), the inflation targeting measure is replaced with a vector of inflation targeting measures by region, and a vector of regional dummies is added as well:

$$\pi_{it} = \beta_0 + \beta_R \overrightarrow{IT_{Rit}} + \beta_2 \pi_{it-1} + \beta_3 \pi_{it}^H + \gamma_R \vec{R} + u_{it} \qquad (2)$$

R signifies the six regions which the data will be broken down into (Asia; Eastern and Southern Europe; Latin America and the Caribbean; Middle East and North Africa; Oceania; and Sub-Saharan Africa). By augmenting Brito and Bystedt's (2010) inflation targeting models with regional dummy variables to account for variation in both inflation rates as well as the impact of inflation targeting policy across regions, we can improve the model and better identify successes and failures of inflation targeting regimes. We suspect that given the variety of differences across regions it will be important to control for clustering effects. Hence in the fixed effects specification of the model, we will be utilizing cluster-robust standard errors. Our expectation for this particular model is that each of the regions will have differences in the effectiveness of inflation targeting mainly due to institutional differences in their governments and central banks.

[9] An alternative specification was also examined in which high inflation took a value of 1 for inflation rates in excess of 50%. There were no statistically significant differences between the two specifications and the correlation between the two was 0.962.

Furthermore, the base model will be augmented slightly so that it can also be used to assess the impact of inflation targeting on economic growth. However, since there is likely an adjustment period during the transition from one monetary regime to another, the net impact of inflation targeting on growth probably will come with a delay. Therefore, we replace the single measure of inflation targeting with a vector measuring the impact of inflation targeting over time. Additionally, since economic growth is also dependent upon interest rates, we include the change in interest rates along with a lag of growth as controls in place of the lagged level of inflation. Equations (3) and (4) illustrate the two versions of this analysis, one with and one without a regional breakdown:

$$\%\Delta Y_{it} = \beta_0 + \beta_T \overrightarrow{IT_{it}} + \beta_2 \Delta r_{it} + \beta_3 \%\Delta Y_{it-1} + \beta_4 \pi_{it}^H + u_{it} \tag{3}$$

$$\%\Delta Y_{it} = \beta_0 + \beta_{RT} \overrightarrow{\overline{IT_{Rit}}} + \beta_2 \Delta r_{it} + \beta_3 \%\Delta Y_{it-1} + \beta_4 \pi_{it}^H + \gamma_R \vec{R} + u_{it} \tag{4}$$

The inflation targeting vector will encompass up to eight quarters of lags to identify when and how inflation targeting impacts economic growth. In equation (4) that vector is applied to each of the six regions of analysis. We suspect that similar to equations (1) and (2), the growth models should also yield significant results, albeit with somewhat of a delayed impact. This impact should lose significance over time as the initial boost in growth rate will probably not feature substantive increases down the line. At the regional level, just as we suspect there will be institutional differences within each region in terms of effectiveness in combating inflation, there should also be differences in effectiveness with respect to economic growth.

Data

We examine a large set of fifty-one developing countries including seventeen explicit inflation targeters. Since developing countries are so diverse, it is important to obtain a sample of similar countries to compare the effects of inflation targeting on inflation levels. To ensure the success of inflation targeting can be rightfully assessed by comparing the developing countries to similar countries that pursue other monetary policies, we have followed the sample selection process of Lin and Ye (2009). The control group we employ only includes non-targeting countries that have real GDP per capita that is at least as large as that of the poorest targeting country, and that has a population size as least as large as the least populated country in the targeting group.[10]

The data is pulled from the International Monetary Fund's Financial Statistics database. When data was not available for a country from the IMF, data was obtained from the Global Financial Database. The frequency of the data is quarterly and spans the time period 1985-2010. The data is furthermore divided into regional sections in order to determine regional effects of inflation targeting. The regions studied include the following: Asia, Eastern and Southern Europe, Latin America. Most of our observations in this sample can be classified in the Eastern and Southern European region, the Latin American and the Caribbean region, and the Middle East and North African region.

Table 1 illustrates the descriptive statistics of the variables in the study for the entire sample period. From Table 1, we can see that the average inflation rate experienced by the entire sample is around 4%. The rate experienced in Eastern and Southern Europe and the Latin America and the Caribbean regions are slightly higher with rates around 5%. Table 1 illustrates that the lowest average inflation rates occur in the Asian, Oceanic, and Sub-Saharan African

[10] For further information, see Lin and Ye (2009).

regions, with rates around 1-1.5%. These rates indicate that inflation rates in these regions are much more under control than the other regions in the study. The highest inflation rate experienced during this time period occurs in the Eastern and Southern European region indicating periods of hyperinflation in this region during the early years of transition. The average volatility of the inflation rate experienced by the entire sample is a standard deviation of 12.40. The volatility of this rate is higher most notably in the Eastern and Southern European region with a standard deviation of 19.06, indicating greater volatility experienced in this region due to the transition to a market economy and price reforms.

From Table 1, it can be noted the variation in economic growth experienced in this sample. For the entire sample period, the average real GDP per capita value is around $5,816. In terms of this economic growth factor, the poorest region is that of Sub-Saharan Africa (with real GDP per capita of $369). The wealthiest region is the Asian region with a real GDP per capita of $13,783. In terms of this economic wealth factor, the other regions range from $520 experienced in Middle East and North Africa to $7,030 experienced in Eastern and Southern Europe. As noted previously, our sample period only employs non-targeting countries that have real GDP per capita that is at least as large as that of the poorest targeting country. This measure ensures that the sample period is more homogeneous.

Estimation Results

Table 2 lists the replication results of Brito and Bystedt's (2010) models 1 through 3 using our data set. The two OLS specifications match up well with the earlier results in that inflation targeting directly negatively impacts the inflation rate. However, when using a fixed effects panel regression the coefficient for inflation targeting, while still negative is no longer significant. Models 4 through 6 follow the functional form of models 1 through 3 but include the regional breakdown in the data. The results of these regressions can be found in Table 3.

Interestingly, while the OLS version reported in model 4 has negative coefficients for all six of the regions, not all were significant. This indicates that it is possible that inflation targeting is ineffective policy for some nations in combating high levels of inflation. Furthermore, following Brito and Bystedt's (2010) second augmentation featuring a time control, all six of the regions lose significant. However, in each of these first two cases there is no control for clustering in the standard errors, thus the results are potentially biased. Model 6, on the other hand, introduces cluster-robust standard errors into the model (following the third specification in Brito and Bystedt (2010)). Among the six regions, the Eastern and Southern European nations that started inflation targeting experienced a one-point reduction in their inflation rates. Relative to their mean inflation rate of 4.63%, this represents a 0.05 standard deviation decline. Similarly, the Middle Eastern and North African nations experience a 4.53-point reduction in inflation on average which represents a 0.82 standard deviation decline from their mean. On the other hand, Asian, Sub-Saharan African, and Oceanic nations experience average increases in inflation of close to one point. This in turn translates to 0.59, 0.63, and 0.44 standard deviation increases in inflation for countries each of the three regions respectively. This further underscores the previous notion that inflation targeting is far from a universal tool to combat inflationary pressures.

The other major portion of our analysis deals with real economic growth in light of inflation targeting. Models 7 through 9 in Table 4 utilize a series of eight quarterly lags to capture the timing effects of inflation targeting policy on real GDP growth rates over the course of two years. Once again, following the fixed effects version, what we find is that the quarter in which there is a regime change, growth will slow by 5.0%. However, the following quarter will feature an 6.7% increase in the growth rate. Thus for our sample of countries, the net two-period increase in growth from inflation targeting is 1.7%. A possible explanation for this divergence is that countries which undergo inflation targeting likely face an unstable economic situation going in, and a sudden regime shift only adds more uncertainty to their economy. However, once implemented the inflation targeting should be beneficial for the economy in the following quarter. Overall this growth appears to be short-term only since the subsequent quarters do not have any significant differences between inflation-targeting and non-inflation-targeting countries.[11]

Next, in models 10 through 12, we examine the timing effects of inflation targeting on real GDP growth across each of the regions. As before, we find major differences between several of the regions. For this particular set of models, the Sub-Saharan Africa region drops out due to data limitations. Furthermore, the Oceanic nations do not experience any significant impact in economic growth whatsoever from a transition to inflation targeting. Most surprising of all is that the Asian countries face a net overall two-quarter downward shift in growth rates as a result of inflation targeting. During the transition, growth rates will fall by 5.7% on average; and they will only be offset by a 5.2% increase the following period leaving them roughly 0.5% lower than they would have been had they not began inflation targeting. This coincides with the prior results showing that these nations actually incur increases in inflation following a regime change. More than likely this has to do with the strength and openness of the central bank along with overall institutional quality.[12]

[11] Note that regardless of the length of the lags, beyond the first quarter following the implementation of inflation targeting the impact on growth is insignificant.
[12] See Dincer and Eichengreen’s (2007) research on central bank transparency for example.

The remaining regions all benefit from inflation targeting but have differences in magnitude in the impact on their growth rates. The Middle Eastern and North African nations experience an immediate 9.6% drop in their real GDP growth rates in the quarter in which inflation targeting occurs. However, this drop is more than offset by a large 11.0% gain in the following quarter; leaving them with an overall 1.4% average net increase in GDP growth rate. The Southern and Eastern European and the Latin American and Caribbean countries have much smaller quarterly and net changes in real growth rates. The initial period of inflation targeting will bring with it a 5.2% decline in real growth in the average nation in this region. This is followed by a 5.6% increase which brings the net growth rate up 0.4% overall. Similarly, Latin American and Caribbean nations also experience a drop in real GDP growth rates brought upon by the regime change. Inflation targeting lowers real GDP growth by 2.5% on average. This is surpassed in the following quarter by a 2.9% average increase leaving a 0.4% net gain to GDP growth as well. Once again, in all cases, this growth is short-term only and after the quarter following the regime change, all of the countries grow at exactly the same rate as the remaining countries in their region.[13]

Conclusion

To summarize, while inflation targeting is a helpful tool in reducing inflation, the direct impact on growth is fairly limited. Middle Eastern and North African and Southern and Eastern European nations are able to lower their inflation rates substantially by undergoing a regime change to begin inflation targeting. And along with Latin American and Caribbean nations, all of these nations are able to turn that into direct success in short-term economic growth.

[13] Our findings compare favorably to those in reported in Svensson (2011) in which he examines many of the same studies as reported in our table in the literature review and finds that overall inflation targeting brings about a reduction in inflation rates with little effect at all on GDP.

Meanwhile, the Asian, Sub-Saharan African, and Oceanic nations that undergo inflation targeting will actually find that their inflation rates will rise under the new regime, and therefore will not undergo any substantive economic growth through an inflation targeting regime change. Overall, however, any impact on growth is short-term, if present at all, indicating that inflation targeting is only beneficial in reducing inflation and not for stimulating economic growth.

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Table 1: Descriptive Statistics

	n	Mean	Std Dev	Min	Max
Overall					
Inflation Rate (as ΔCPI)	3984	-0.130	10.080	-347.367	325.505
Interest Rate	4,062	-0.925	196.387	-11300.240	3617.163
Real GDP Per Capita	2,389	0.144	1.755	-44.737	14.927
Asia					
Inflation Rate (as ΔCPI)	392	-0.037	1.468	-5.529	6.096
Interest Rate	390	-0.041	1.442	-8.463	7.490
Real GDP Per Capita	237	0.173	2.100	-9.073	4.460
Eastern and Southern Europe					
Inflation Rate (as ΔCPI)	1093	-0.337	17.781	-347.367	325.505
Interest Rate	1116	-0.335	23.057	-314.533	427.647
Real GDP Per Capita	984	0.004	2.070	-35.010	14.927
Latin America and the Caribbean					
Inflation Rate (as ΔCPI)	1204	-0.078	5.361	-144.233	31.418
Interest Rate	1232	-0.045	355.839	-11300.240	3617.163
Real GDP Per Capita	469	0.009	0.105	-0.504	0.613
Middle East and North Africa					
Inflation Rate (as ΔCPI)	803	-0.049	5.247	-38.762	35.656
Interest Rate	820	0.078	13.717	-154.9	209.103
Real GDP Per Capita	451	-0.098	2.107	-44.737	0.256
Oceania					
Inflation Rate (as ΔCPI)	276	-0.001	1.986	-15.295	16.248
Interest Rate	282	0.006	3.670	-21.42	30.920
Real GDP Per Capita	205	0.142	0.653	-2.893	3.118
Sub-Saharan Africa					
Inflation Rate (as ΔCPI)	216	-0.011	1.926	-8.309	5.696
Interest Rate	222	0.019	1.316	-3.300	13.717
Real GDP Per Capita	43	0.004	0.032	-0.064	0.045

Table 2: Regression Results of Inflation Rates on Inflation Targeting

Coefficient:	**Model 1**	**Model 2**	**Model 3**
Inflation Targeting			
Coefficient:	-1.230***	-0.558*	-0.803
Standard Error:	(0.290)	(0.302)	(0.677)
Lag of Inflation (one-quarter)			
Coefficient:	0.311***	0.300***	-0.264***
Standard Error:	(0.011)	(0.011)	(0.091)
High Inflation Dummy			
Coefficient:	93.888***	94.325***	97.009***
Standard Error:	(1.794)	(1.783)	(20.093)
Time (quarters)			
Coefficient:		-0.034***	-0.034***
Standard Error:		(0.005)	(0.008)
R^2	**.6698**	**.6739**	**.6735**
F	**2691.61**	**2059.18**	**149.30**
n, groups	3984	3984	3984, 51

Note: All regressions were also run with constants as well. Model 3 uses robust standard errors.
*Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Table 3: Regression Results of Inflation Rates on Regional Inflation Targeting

Coefficient:	**Model 4**	**Model 5**	**Model 6**
Asia IT			
Coefficient:	-1.610**	-0.898	0.979***
Standard Error:	(0.746)	(0.748)	(0.343)
Eastern and Southern Europe IT			
Coefficient:	-1.385**	-0.568	-1.005**
Standard Error:	(0.542)	(0.550)	(0.487)
Latin America and Caribbean IT			
Coefficient:	-1.229***	-0.651	-0.662
Standard Error:	(0.463)	(0.466)	(1.109)
Middle East and North Africa IT			
Coefficient:	-0.863	-0.409	-4.535**
Standard Error:	(0.683)	(0.681)	(2.192)
Oceania IT			
Coefficient:	-0.974	-0.009	1.044***
Standard Error:	(0.994)	(0.997)	(0.377)
Sub-Saharan Africa IT			
Coefficient:	-1.027	-0.250	0.975***
Standard Error:	(1.084)	(1.082)	(0.195)
Lag of Inflation (one-quarter)			
Coefficient:	0.311***	0.300***	-0.261***
Standard Error:	(0.011)	(0.0110)	(0.090)
High Inflation Dummy			
Coefficient:	93.902***	94.335***	97.342***
Standard Error:	(1.795)	(1.784)	(20.092)
Time (quarters)			
Coefficient:		-0.034***	-0.034***
Standard Error:		(0.005)	(0.008)
R^2	**.6699**	**.6743**	**.6695**
F	**1008.37**	**914.28**	**832.95**
n, groups	3984	3984	3984, 51

Note: All regressions were also run with constants as well as regional dummy variables. Model 6 uses robust standard errors. *Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Table 4: Regression Results of Real GDP Growth Rates on Inflation Targeting

Coefficient:	**Model 7**	**Model 8**	**Model 9**
Inflation Targeting			
Coefficient:	-0.052**	-0.052**	-0.047***
Standard Error:	(0.026)	(0.026)	(0.015)
Inflation Targeting Lag 1			
Coefficient:	0.073**	0.073**	0.072***
Standard Error:	(0.037)	(0.037)	(0.023)
Inflation Targeting Lag 2			
Coefficient:	-0.002	-0.002	0.001
Standard Error:	(0.034)	(0.034)	(0.035)
Inflation Targeting Lag 3			
Coefficient:	-0.027	-0.027	-0.027
Standard Error:	(0.030)	(0.030)	(0.038)
Inflation Targeting Lag 4			
Coefficient:	0.033	0.033	-0.033
Standard Error:	(0.030)	(0.030)	(0.026)
Inflation Targeting Lag 5			
Coefficient:	-0.016	-0.016	-0.016
Standard Error:	(0.030)	(0.030)	(0.033)
Inflation Targeting Lag 6			
Coefficient:	-0.024	-0.024	-0.025
Standard Error:	(0.030)	(0.030)	(0.025)
Inflation Targeting Lag 7			
Coefficient:	0.004	0.004	0.004
Standard Error:	(0.030)	(0.030)	(0.025)
Inflation Targeting Lag 8			
Coefficient:	0.006	0.006	0.008
Standard Error:	(0.021)	(0.021)	(0.013)
Change in Interest Rates			
Coefficient:	$-2.1*10^{-5}$***	$-2.1*10^{-5}$***	$-2.1*10^{-5}$***
Robust Standard Error:	$(7.7*10^{-6})$	$(7.7*10^{-6})$	$(3.4*10^{-6})$
Lag of Real GDP Growth			
Coefficient:	-0.211***	-0.211***	-0.223***
Standard Error:	(0.022)	(0.022)	(0.060)
High Inflation Dummy			
Coefficient:	-0.015	-0.016	-0.026
Standard Error:	(0.024)	(0.024)	(0.051)
Time (quarters)			
Coefficient:		$-2.5*10^{-5}$	$-1.4*10^{-4}$
Standard Error:		$(9.8*10^{-5})$	$(8.8*10^{-5})$
R^2	**.0520**	**.0520**	**.0570**
F	**9.38**	**8.66**	**181.47**
n, groups	2066	2066	2066, 32

Note: All regressions were also run with constants as well. Model 9 uses robust standard errors.
*Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Table 5: Fixed Effects Regression Results of Real GDP Growth Rates on Regional Inflation Targeting

Coefficient:	**Model 10**	**Model 11**	**Model 12**
Asia IT			
Coefficient:	-0.054	-0.053	-0.057***
Standard Error:	(0.067)	(0.067)	(0.008)
Asia IT Lag			
Coefficient:	0.048	0.050	0.052***
Standard Error:	(0.067)	(0.068)	(0.009)
Eastern and Southern Europe IT			
Coefficient:	-0.056	-0.057	-0.052*
Standard Error:	(0.055)	(0.055)	(0.029)
Eastern and Southern Europe IT Lag			
Coefficient:	0.046	0.047	0.056*
Standard Error:	(0.055)	(0.055)	(0.033)
Latin America and Caribbean IT			
Coefficient:	-0.020	-0.020	-0.025**
Standard Error:	(0.047)	(0.047)	(0.010)
Latin America and Caribbean IT Lag			
Coefficient:	0.026	0.028	0.029**
Standard Error:	(0.048)	(0.048)	(0.011)
Middle East and North Africa IT			
Coefficient:	-0.106	-0.107	-0.096*
Standard Error:	(0.067)	(0.067)	(0.048)
Middle East and North Africa IT Lag			
Coefficient:	0.098	0.100	0.110***
Standard Error:	(0.067)	(0.067)	(0.033)
Oceania IT			
Coefficient:	-0.042	-0.040	-0.035
Standard Error:	(0.067)	(0.067)	(0.053)
Oceania IT Lag			
Coefficient:	0.051	0.052	0.053
Standard Error:	(0.068)	(0.068)	(0.055)
Change in Interest Rates			
Coefficient:	$-2.2*10^{-5}$***	$-2.1*10^{-5}$***	$-2.1*10^{-5}$***
Robust Standard Error:	$(7.7*10^{-6})$	$(7.8*10^{-6})$	$(3.5*10^{-6})$
Lag of Real GDP Growth			
Coefficient:	-0.215***	-0.215***	-0.224***
Standard Error:	(0.022)	(0.022)	(0.061)
High Inflation Dummy			
Coefficient:	-0.009	-0.011	-0.026
Standard Error:	(0.024)	(0.024)	(0.052)
Time (quarters)			
Coefficient:		$-8.4*10^{-5}$	$-1.6*10^{-4}$***
Standard Error:		$(1.0*10^{-4})$	$(8.4*10^{-5})$
R^2	**.0535**	**.0538**	**.0560**
F	**6.43**	**6.13**	**85.35**
n, groups	2066	2066	2066, 32

Note: All regressions were run with constants, regional dummy variables, as well as additional quarterly lags. Only the first lags are reported in this table because the others are insignificant throughout each specification. The Sub-Saharan Africa region was omitted in these specifications due to data limitations. Model 12 uses robust standard errors. *Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level