Available online at www.sciencedirect.com
ScienceDirect
Journal of Policy Modeling xxx (2014) xxx–xxx
Journal of Policy Modeling
www.elsevier.com/locate/jpm

Does inflation targeting lower inflation and spur growth?

Kelly Ayres, Ariel R. Belasen*, Ali M. Kutan

Department of Economics and Finance at Southern Illinois University Edwardsville, United States

Received 2 June 2012; received in revised form 28 August 2012; accepted 30 December 2012

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 across six regions. 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

Keywords: Inflation; Targeting; Growth; International; Emerging economies

1. Introduction and motivation

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; and (4) inability of inflation targeting to be successful in countries that do not meet strict preconditions.[1]

* Corresponding author.
E-mail addresses: kayres@siue.edu (K. Ayres), abelase@siue.edu (A.R. Belasen), akutan@siue.edu (A.M. Kutan).
[1] For further information, see, among others, Batini and Laxton (2007).

0161-8938/$ – see front matter
http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

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 further 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 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 and to design appropriate policies in individual countries and specific regions accordingly. The results have important broader policy implications. For example, international monetary institutions like the IMF, the World Bank, the European Central Bank and alike can judge whether regional inflation stability and economic growth might be achieved using an inflation targeting regime. If there are differences in the performance of inflation targeting regimes, regional meetings of the IMF and the World Bank may discuss these issues by organizing policy roundtables, leading to further stability in the global economy and cooperation between policymakers and central banks in regional countries and international institutions including the IMF and the World Bank. Then these international institutions may advice individual countries and regions accordingly by better understanding the differences in the performance of inflation targeting regime across different regions. Region specific policy tools may be used to achieve inflation stability and economic growth. For example, certain countries in a region may establish new ways of coordinating policy by establishing some new forms of economic or monetary unions or agreements toward their policy objectives such as low inflation and stable economic growth.

2. Background and literature review

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 instruments; (4) have increased transparency of monetary policy 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

[2] For further information, see Mishkin (2004, 2008).
[3] Numbers as of 2010 from central banks' websites.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

done examining the industrial countries,[4] and there are many studies that have shown favorable results for the industrial inflation targeters. 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. 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. Siklos (2008) examines the experience of 29 inflation and non-inflation targeting countries by comparing actual and forecasted inflation and find that IT regime may not be fragile in emerging market economies. Using data from both developing and developed countries during the years 1980–2007, Abo-Zaid and Tuzemen (2012) show that countries that do not inflation target would benefit from employing an inflation targeting regime. Developing countries that use inflation targeting have much more stable inflation and higher and more stable GDP growth. In developed targeting countries, there is high GDP growth and a more disciplined fiscal policy.

Another study done by Mollick, Cabral, and Carneiro (2011) utilized static panel data methods to explore the impact of inflation targeting (IT) on output growth during the years of 1986–2004. The authors found that the full utilization of an IT system in industrial and emerging economies results in higher output income per capita. However, the impact on output in emerging market economies was lower. The authors believe that this result may actually be due to lag times in credibility and later implementation of this type of systematic approach to economics.

Utilizing a univariate autoregressive process for each inflation rate, Levin et al. (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

[4] For example, see Mishkin and Schmidt-Hebbel (2007), Neumann and von Hagen (2002), and Levin, Natalucci, and Piger (2004).

[5] See Ball and Sheridan (2005), Cecchetti and Ehrmann (2002), and Angeriz and Arestis (2006).

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

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.

There are also some individual country studies. Us (2004) looks at inflation in the Turkish economy. Turkey has seen high levels of inflation over the last three decades. Utilizing the standard methodologies of VARs and Grainger Causality tests, the author states that the high inflation in Turkey is due to increases in public sector prices. Us (2004) stresses the importance of the Central Bank maintaining a price stability commitment as well as transparency in monetary policy as being important in maintaining credibility. In a follow-up study, Us (2007) analyzes alternative monetary policy rules under various IT regime schemes, including a forward-looking Taylor rule, an monetary conditions index (MCI) rule under strict IT, and an MCI rule under flexible IT. The results indicate that the second alternative is the best scheme in that the economy stabilizes much more quickly, and shows significantly less volatility, in the second alternative. Tanuwidjaja and Choy (2006) propose that in order to achieve lower inflation rates, the Indonesian central bank has to gain credibility. The development of monetary policy that targets inflation and output gaps would produce less macroeconomic volatility. In addition, the development of including an exchange rate as a feedback variable needs to be looked at for use in the future success of monetary policy management. Singh and Kalirajan (2003) study the Indian economy. Utilizing data from the years 1971–1998, the authors state that an increase in inflation has a negative effect on economic growth. In particular, increases in inflation from the previous period negatively impacts economic growth. The authors indicate that gains can be made from directing monetary policy toward maintaining price stability. In addition, the authors show that policy makers should strive to not only maintain price stability, but to keep inflation levels on par with their trading partners. Holub and Hurnik (2008) focus on the Czech Republic's first ten years of experience with an inflation targeting. Using VAR models, they find that the Czech National Bank successfully achieved disinflation under the new policy regime and the regime has successfully anchored inflation expectations in the economy.

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 prior studies can be found in Table 1 as well as the survey paper by Svensson (2011).

[6] For reference, see Mishkin (2004, 2008).

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 1
Survey analysis.

Author	Methodology	Time span	Frequency	Size of sample	Impact on inflation	Impact on GDP	R^2 of GDP regressions
Angeriz and Arestis (2006)	SURE	1980–2004	Quarterly	10 IT	No impact	N/A	N/A
Ball and Sheridan (2005)	Diff-in-diff	1960–2000	Quarterly	7 IT, 13 non-IT	Small decline	Weak increase	.02–.23 depending on sample
Batini and Laxton (2007)	Diff-in-diff	1985–2004	Quarterly	31 countries, 21 IT, 10 non-IT	Strong decline	N/A	N/A
Brito and Bystedt (2006)	Diff-in-diff	1994–2005	Quarterly	5 IT, 8 non-IT	Strong decline	Strong increase	.12 and .28
Brito and Bystedt (2010)	OLS, fixed effects	1980–2006	3 year periods	13 IT, 33 non-IT	Weak decline	Weak increase	.15, .18, .20
Goncalves and Salles (2008)	Diff-in-diff	1980–2005	Annual	13 IT, 23, non-IT	Strong decline	N/A	N/A
Lin and Ye (2009)	Probit propensity scores	1985–2005	Annual	52 countries, 13 IT	Strong decline	N/A	N/A
Mishkin and Schmidt-Hebbel (2007)	OLS, IV	1989–2004	Quarterly	13 non-IT, 21 IT	Decline	N/A	N/A
Levin et al. (2004)	Impulse responses	1994–2003	Quarterly	5 IT, 7 non-IT	Reduces inflation persistence	N/A	N/A
Neumann and von Hagen (2002)	VARs, impulse responses	1978–2001	Monthly, quarterly	7 IT, 3 non-IT	Decline	N/A	N/A

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

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 (2007) 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-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 (2008) and Batini and Laxton (2007) 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]

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.

2.1. 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

[7] For example, see Goncalves and Salles (2008) and Batini and Laxton (2007).
[8] For further study, see Brito and Bystedt (2010).

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

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 Eq. (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 (FE) 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. Additionally, for verification purposes we also include a dummy variable that captures the impact of the Asian Financial Crisis on the sample. This is also run once via OLS and a second time via FE. Next, we run the complete series of models a second time, but this time accounting for regional differentiation. In Eq. (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. As before we also examine the impact of the Asian Financial Crisis on the sample due to the large swings in global prices that were brought on during the crisis:

$$\pi_{it} = \beta_0 + \beta_R \overrightarrow{IT_{Rit}} + \beta_2 \pi_{it-1} + \beta_3 \pi_{it}^{H} + \beta_4 AFC + \gamma_R \vec{R} + u_{it} \tag{2}$$

where *AFC* is the dummy variable for the Asian Financial Crisis and *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 and other factors.

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. Eqs. (3) and (4) illustrate the two versions of this analysis, one with and one without a regional breakdown:

$$\Delta Y_{it} = \beta_0 + \beta_T \overrightarrow{IT_{it}} + \beta_2 \Delta r_{it} + \beta_3 \Delta Y_{it-1} + \beta_4 \pi_{it}^{H} + \beta_5 AFC + u_{it} \tag{3}$$

[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.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

$$\Delta Y_{it} = \beta_0 + \beta_{RT}\overrightarrow{IT_{Rit}} + \beta_2 \Delta r_{it} + \beta_3 \Delta Y_{it-1} + \beta_4 \pi_{it}^{H} + \beta_5 AFC + \gamma_R \vec{R} + u_{it} \quad (4)$$

The inflation targeting vector will encompass up to eight quarters of lags to identify when and how inflation targeting impacts economic growth. In Eq. (4) that vector is applied to each of the six regions of analysis. We suspect that similar to Eqs. (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 and other differences within each region in terms of effectiveness in combating inflation, there should also be differences in effectiveness with respect to economic growth.

2.2. 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.[11] 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, however, due to transitionary changes for some of the countries (such as former Eastern Bloc members), the panel data is unbalanced and does not cover the entire time period for all countries. See Table 2 for more details. The data is furthermore divided into six regional sections in order to determine regional effects of inflation targeting: Asia; Southern and Eastern Europe; Latin America and the Caribbean; the Middle East and North Africa; Oceania; and Sub-Saharan Africa.

Table 3 illustrates the descriptive statistics of the variables in the study for the entire sample period. From Table 3, 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 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.

[10] For further information, see Lin and Ye (2009).
[11] Data for CPI, GDP, population, and interest rates were pulled from the 2010 version of IMF IFS.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 2
IT time period and sample period.

Country	Time frame of study	IT time period	Country	Time frame of study	IT time period
Africa			Slovak Republic	1993: Q1–2010:Q2	2005:Q1–2010:Q2
Cape Verde	1993:Q1–2010:Q2		Slovenia	1993:Q1–2010:Q2	
Mauritius	1985:Q1–2010:Q2		Ukraine	1993:Q1–2010:Q2	
South Africa	1998:Q1–2010:Q2	2000:Q1–2010:Q2			
Asia			*Latin America and the Caribbean*		
China	1992:Q1–2010:Q2		Argentina	1993:Q1–2010:Q2	
Hong Kong	1994:Q1–2010:Q2		Brazil	1991:Q1–2010:Q2	1999:Q3–2010:Q2
Korea	1985:Q1–2010:Q2	1998:Q2–2010:Q2	Chile	1985:Q1–2010:Q2	1991:Q1–2010:Q2
Macao	1988:Q1–2010:Q2		Colombia	1994:Q1–2010:Q2	1999:Q4–2010:Q2
Thailand	1993:Q1–2010:Q2	2000:Q2–2010:Q2	Costa Rica	1985:Q1–2010:Q2	
Eastern and Southern Europe			Dominican Republic	1996:Q1–2010:Q2	
Belarus	1996:Q1–2010:Q2		Guatemala	1986:Q1–2010:Q2	
Bulgaria	1994:Q1–2010:Q2		Jamaica	1985:Q1–2010:Q2	
Croatia	1994:Q2–2010:Q2		Mexico	1985:Q1–2010:Q2	1999:Q1–2010:Q2
Czech Republic	1994:Q1–2010:Q2	1998:Q1–2010:Q2	Paraguay	1991:Q1–2010:Q2	
Estonia	1993:Q3–2010:Q2		Peru	1992:Q1–2010:Q2	2002:Q1–2010:Q2
Georgia	1996:Q1–2010:Q2		Trinidad and Tobago	1985:Q1–2009:Q4	
Hungary	1992:Q1–2010:Q2	2001:Q3–2010:Q2	Uruguay	1985:Q1–2010:Q2	
Kazakhstan	1994:Q1–2010:Q2		Venezuela	1985:Q1–2009:Q4	
Latvia	1994:Q1–2010:Q2				
Lithuania	1994:Q1–2010:Q2				
Macedonia	1994:Q1–2010:Q2				
Poland	1992:Q1–2010:Q2	1998:Q4–2010:Q2			
Romania	1995:Q1–2010:Q2	2005:Q3–2010:Q2			
Russia	1995:Q1–2010:Q2				
Middle East and North Africa			*Oceania*		
Algeria	1985:Q1–2010:Q2		Indonesia	1990:Q1–2009:Q4	2005:Q3–2010:Q2
Egypt	1985:Q1–2010:Q2		Philippines	1985:Q1–2009:Q4	2002:Q1–2010:Q2
Israel	1985:Q1–2010:Q2	1992:Q1–2010:Q2	Singapore	1985:Q1–2010:Q2	
Iran	1986:Q2–2009:Q2				
Jordan	1993:Q1–2010:Q2				
Morocco	1994:Q1–2010:Q2				
Syria	1985:Q1–2010:Q2				
Tunisia	1988:Q1–2010:Q2				
Turkey	1987:Q1–2010:Q2	2002:Q1–2010:Q2			

From Table 2, 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 $5816. 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 $7030 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.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 3
Descriptive statistics.

	n	Mean	Std dev	Min	Max
Overall					
Inflation rate (as ΔCPI)	3984	−0.130	10.080	−347.367	325.505
Interest rate	4062	−0.925	196.387	−11300.240	3617.163
Growth real GDP per capita	2389	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
Growth 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
Growth 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
Growth 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
Growth 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
Growth 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
Growth real GDP per capita	43	0.004	0.032	−0.064	0.045

3. Estimation results

Table 3 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, or lowers, the inflation rate, and augmenting the OLS models with a dummy for the Asian Financial Crisis does not significantly change the coefficients. However, when using a fixed effects panel regression the coefficient for inflation targeting, while still negative is no longer significant. Models 6 through 10 follow the functional forms of models 1 through 5 but include the regional breakdown in the data. The results of these regressions can be found in Table 4.

Interestingly, the OLS version reported in model 6 only has negative coefficients for regional inflation targeting in half of the regions: Southern and Eastern Europe; Latin America and the Caribbean; and the Middle East and North Africa. This indicates that it is possible that inflation targeting is an ineffective policy for some nations in combating high levels of inflation. Furthermore, following Brito and Bystedt's (2010) second augmentation featuring a time control, only Latin America and the Caribbean retain significance. Adding in a control for the Asian Financial Crisis restores the significance for Southern and Eastern Europe as well (likely controlling for the instability in the Russian Ruble that was brought on by the crisis).

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 4
Regression results of inflation rates on inflation targeting (Brito and Bystedt (2010) replication).

Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5
Inflation targeting					
Coefficient	−1.230***	−0.558*	−0.596**	−0.803	−0.875
Standard error	(0.290)	(0.302)	(0.303)	(0.677)	(0.675)
Lag of inflation (one-quarter)					
Coefficient	0.311***	0.300***	0.299***	0.264***	0.264***
Standard error	(0.011)	(0.011)	(0.110)	(0.091)	(0.091)
High inflation dummy					
Coefficient	93.888***	94.325***	94.359***	97.009***	97.018***
Standard error	(1.794)	(1.783)	(1.783)	(20.093)	(20.056)
Asian financial crisis dummy					
Coefficient			−0.728**		−0.785**
Standard error			(0.366)		(0.346)
Time (quarters)					
Coefficient		−0.034***	−0.034***		−0.035***
Standard error		(0.005)	(0.008)		(0.008)
R^2	.6698	.6739	.6746	.6735	.6738
F	2691.61	2059.18	1649.36	149.30	127.03
n, groups	3984	3984	3984	3984, 51	3984, 51

Notes: All regressions were also run with constants as well. Models 1–3 were run using OLS. Models 4 and 5 were fixed effects models run using robust standard errors.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

However, in each of these first three cases there is no control for clustering in the standard errors, thus the results are potentially biased. Models 9 and 10, on the other hand, introduce 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.[12] 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 11 through 15 in Table 5 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 to an inflation targeting policy, growth will slow by 5.0%. However, the following quarter will feature a 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

[12] Note that statistical analysis indicates that the slight differences in these three coefficients are indeed significant.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 5
Regression results of inflation rates on regional inflation targeting.

Coefficient	Model 6	Model 7	Model 8	Model 9	Model 10
Asia IT					
Coefficient	−0.333	0.498	0.472	0.979***	0.950**
Standard error	(0.835)	(0.836)	(0.836)	(0.343)	(0.377)
Eastern and Southern Europe IT					
Coefficient	−1.440**	−0.943	−1.000*	−1.005**	−1.096**
Standard error	(0.575)	(0.575)	(0.575)	(0.488)	(0.485)
Latin America and Caribbean IT					
Coefficient	−1.838***	−1.067**	−1.101**	−0.662	−0.745
Standard error	(0.499)	(0.506)	(0.506)	(1.109)	(1.085)
Middle East and North Africa IT					
Coefficient	−1.207*	−0.582	−0.582	−4.535**	−4.516*
Standard error	(0.720)	(0.719)	(0.719)	(2.192)	(2.258)
Oceania IT					
Coefficient	0.062	1.502	1.455	1.044***	0.990***
Standard error	(1.087)	(1.095)	(1.095)	(0.377)	(0.366)
Sub-Saharan Africa IT					
Coefficient	0.151	0.976	0.908	0.975***	0.502**
Standard error	(1.196)	(1.192)	(1.192)	(0.195)	(0.200)
Lag of inflation (one-quarter)					
Coefficient	0.305***	0.292***	0.291***	0.261***	0.260***
Standard error	(0.011)	(0.011)	(0.011)	(0.090)	(0.090)
High inflation dummy					
Coefficient	94.159***	94.573***	94.604***	97.342***	97.342***
Standard error	(1.791)	(1.779)	(1.779)	(20.092)	(20.059)
Asian financial crisis dummy					
Coefficient			−0.762**		−0.741**
Standard error			(0.366)		(0.350)
Time (quarters)					
Coefficient		−0.034***	−0.038***	−0.034***	−0.035***
Standard error		(0.005)	(0.005)	(0.008)	(0.008)
R^2	.6723	.6771	.6774	.6695	.6699
F	626.51	594.45	555.58	832.95	750.68
n, groups	3984	3984	3984	3984, 51	3984, 51

Notes: All regressions were also run with constants as well as regional dummy variables. Models 6–8 were run using OLS. Models 9 and 10 were run using fixed effects with robust standard errors.

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

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.[13]

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

[13] 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.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 6
Regression results of real GDP growth rates on inflation targeting.

Coefficient	Model 11	Model 12	Model 13	Model 14	Model 15
Inflation targeting					
Coefficient	−0.052**	−0.052**	−0.051*	−0.047***	−0.46***
Standard error	(0.026)	(0.026)	(0.026)	(0.015)	(0.015)
Inflation targeting lag 1					
Coefficient	0.073**	0.073**	0.073**	0.072***	0.072***
Standard error	(0.037)	(0.037)	(0.037)	(0.023)	(0.023)
Inflation targeting lag 2					
Coefficient	−0.002	−0.002	−0.002	0.001	0.001
Standard error	(0.034)	(0.034)	(0.034)	(0.035)	(0.035)
Inflation targeting lag 3					
Coefficient	−0.027	−0.027	−0.027	−0.027	−0.027
Standard error	(0.030)	(0.030)	(0.030)	(0.038)	(0.038)
Inflation targeting lag 4					
Coefficient	0.033	0.033	0.033	0.033	0.033
Standard error	(0.030)	(0.030)	(0.030)	(0.026)	(0.026)
Change in interest rates					
Coefficient	-2.1×10^{-5}***	-2.1×10^{-5}***	-2.1×10^{-5}***	-2.1×10^{-5}***	-2.1×10^{-5}***
Robust standard error	(7.7×10^{-6})	(7.7×10^{-6})	(7.7×10^{-5})	(3.4×10^{-6})	(3.4×10^{-5})
Lag of real GDP growth					
Coefficient	−0.211***	−0.211***	−0.212***	−0.223***	−0.224***
Standard error	(0.022)	(0.022)	(0.022)	(0.060)	(0.060)
High inflation dummy					
Coefficient	−0.015	−0.016	−0.016	−0.026	−0.027
Standard error	(0.024)	(0.024)	(0.024)	(0.051)	(0.050)
Asian financial crisis dummy					
Coefficient			−0.010		−0.010***
Standard error			(0.007)		(0.003)
Time (quarters)					
Coefficient		-2.5×10^{-5}	-4.6×10^{-5}	-1.4×10^{-4}	-1.6×10^{-4}*
Standard error		(9.8×10^{-5})	(9.9×10^{-5})	(8.8×10^{-5})	(8.8×10^{-5})
R^2	.0520	.0520	.0530	.0570	0.0512
F	9.38	8.66	8.19	181.47	214.91
n, groups	2066	2066	2066	2066, 32	2066, 32

Notes: Due to space constraints, the last four lags were left off. The coefficients for those lags were universally highly insignificant. 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.

to data limitations. Furthermore, the Oceanic nations do not experience any significant impact in economic growth whatsoever from a transition to inflation targeting. Most interesting of all is that the Asian countries face a net overall two-quarter downward shift in growth rates as a result of inflation targeting even when controlling for the Asian Financial Crisis. 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 (Table 6).[14]

[14] See Dincer and Eichengreen's (2007) research on central bank transparency for example.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Table 7
Regression results of real GDP growth rates on regional inflation targeting.

Coefficient	Model 16	Model 17	Model 18	Model 19	Model 20
Asia IT					
Coefficient	−0.054	−0.053	−0.050	−0.057***	−0.053***
Standard error	(0.067)	(0.067)	(0.067)	(0.008)	(0.008)
Asia IT lag					
Coefficient	0.048	0.050	0.047	0.052***	0.049***
Standard error	(0.067)	(0.068)	(0.068)	(0.009)	(0.010)
Eastern and Southern Europe IT					
Coefficient	−0.056	−0.057	−0.055	−0.044	−0.042
Standard error	(0.055)	(0.055)	(0.055)	(0.049)	(0.032)
Eastern and Southern Europe IT lag					
Coefficient	0.046	0.047	0.045	0.049	0.046
Standard error	(0.055)	(0.055)	(0.055)	(0.038)	(0.037)
Latin America and Caribbean IT					
Coefficient	−0.020	−0.020	−0.019	−0.025**	−0.024**
Standard error	(0.047)	(0.047)	(0.047)	(0.010)	(0.010)
Latin America and Caribbean IT lag					
Coefficient	0.026	0.028	0.026	0.029**	0.028**
Standard error	(0.048)	(0.048)	(0.048)	(0.011)	(0.012)
Middle East and North Africa IT					
Coefficient	−0.106	−0.107	−0.108	−0.096*	−0.096*
Standard error	(0.067)	(0.067)	(0.067)	(0.048)	(0.048)
Middle East and North Africa IT lag					
Coefficient	0.098	0.100	0.101	0.110***	0.111***
Standard error	(0.067)	(0.067)	(0.067)	(0.033)	(0.032)
Oceania IT					
Coefficient	−0.042	−0.040	−0.040	−0.035	−0.036
Standard error	(0.067)	(0.067)	(0.067)	(0.053)	(0.053)
Oceania IT Lag					
Coefficient	0.051	0.052	0.052	0.053	0.053
Standard error	(0.068)	(0.068)	(0.068)	(0.055)	(0.054)
Change in interest rates					
Coefficient	-2.2×10^{-5}***	-2.1×10^{-5}***	-2.1×10^{-5}***	-2.1×10^{-5}***	-2.0×10^{-5}***
Robust standard error	(7.7×10^{-6})	(7.8×10^{-6})	(7.8×10^{-6})	(3.5×10^{-6})	(3.4×10^{-6})
Lag of real GDP growth					
Coefficient	−0.215***	−0.215***	−0.215***	−0.224***	−0.225***
Standard error	(0.022)	(0.022)	(0.022)	(0.061)	(0.061)
High inflation dummy					
Coefficient	−0.009	−0.011	−0.012	−0.026	0.028
Standard error	(0.024)	(0.024)	(0.024)	(0.052)	(0.051)
Asian financial crisis					
Coefficient			−0.010		−0.009***
Standard error			(0.007)		(0.003)
Time (quarters)					
Coefficient		-8.4×10^{-5}	-1.1×10^{-4}	-1.6×10^{-4}***	-1.8×10^{-4}***
Standard error		(1.0×10^{-4})	(1.0×10^{-4})	(8.4×10^{-5})	(8.3×10^{-5})
R^2	.0535	.0538	.0546	.0473	.0479
F	6.43	6.13	5.91	8.56	8.11
n, groups	2066	2066	2066	2066, 32	2066, 32

Notes: 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.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

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 (Table 7).

4. Conclusion and policy implications

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. 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.

Our results have important policy implications. The results indicate that IT regime have different regional effects in affecting inflation and output growth. In advising individual countries, for example, the International Monetary Fund may take a regional approach to lower inflation and promote economic growth in a particular region. The central banks and international institutions like the IMF and the World Bank may establish annual policy roundtables discussing why regional differences do exist and also promote research on more of a regional level analysis to gauge the different impacts of inflation targeting regime within each particular region. Individual countries in specific regions may establish new forms of cooperation to design policy objectives more at a regional level to achieve low and stable inflation and a sustainable level of economic growth. For example, in addition to regional trade agreements, countries may form new regional unions to further improve regional inflation and growth performance by coordinating their individual monetary, fiscal and exchange rate polices accordingly.

References

Abo-Zaid, S., & Tuzemen, D. (2012). Inflation targeting: A three decade perspective. *Journal of Policy Modeling*, *34*, 621–645.

Angeriz, A., & Arestis, P. (2006). Has inflation targeting had any impact on inflation? *Journal of Post Keynesian Economics*, *28*, 559–571.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008

Ball, L., & Sheridan, N. (2005). Does inflation targeting matter? In B. Bernanke, & M. Woodford (Eds.), *The inflation targeting debate* (pp. 249–276). Chicago: The University of Chicago Press.

Batini, N., & Laxton, D. (2007). Under what conditions can inflation targeting be adopted? The experience of emerging markets. In F. Mishkin, & K. Schmidt-Hebbel (Eds.), *Monetary policy under inflation targeting* (pp. 1–38). Santiago: Central Bank of Chile.

Brito, R., & Bystedt, B. (2006). *The macroeconomic effects of inflation targeting in Latin America. Ibmec Sao Paulo Working Papers*.

Brito, R., & Bystedt, B. (2010). Inflation targeting in emerging economies: Panel evidence. *Journal of Development Economics*, *91*, 198–210.

Cecchetti, S., & Ehrmann, M. (2002). Does Inflation Targeting Increase Output Volatility?: An International Comparison of Policymakers' Preferences and Outcomes. In N. Loayza, & K. Schmidt-Hebbel (Eds.), *Monetary Policy: Rules and Transmission Mechanisms* (pp. 247–274).

Dincer, N., & Eichengreen, B. (2007). *Central bank transparency: Where, why, and with what effects? NBER Working Paper 13003*.

Goncalves, C., & Salles, J. (2008). Inflation targeting in emerging economies: What do the data say? *Journal of Development Economics*, *85*, 312–318.

Holub, T., & Hurnik, J. (2008). Ten years of Czech inflation targeting: Missed targets and anchored expectations. *Emerging Markets Finance and Trade*, *44*(6), 67–86.

Levin, A., Natalucci, F. M., & Piger, J. (2004). The macroeconomic effects of inflation targeting. *Federal Reserve Bank of St. Louis Review*, *86*(4), 51–80.

Lin, S., & Ye, H. (2009). Does inflation targeting make a difference in developing countries? *Journal of Development Economics*, *89*, 118–123.

Mishkin, F. (2004). *Can inflating targeting work in emerging market countries? NBER Working Paper 10646*.

Mishkin, F. S. (2008). Challenges for inflation targeting in emerging market countries. *Emerging Markets Finance and Trade*, *44*(6), 5–16.

Mishkin, F., & Schmidt-Hebbel, K. (2007). *Does inflation targeting make a difference? NBER Working Paper 12876*.

Mollick, A., Cabral, R., & Carneiro, F. (2011). Does inflation targeting matter for output growth? Evidence from industrial and emerging economies. *Journal of Policy Modeling*, *33*, 537–551.

Neumann, M. J. M., & von Hagen, J. (2002). Does inflation targeting matter? *Federal Reserve Bank of St. Louis Review*, *84*(4), 127–148.

Siklos, P. L. (2008). Inflation targeting around the world. *Emerging Markets Finance and Trade*, *44*(6), 17–37.

Singh, K., & Kalirajan, K. (2003). The inflation-growth nexus in India: An empirical analysis. *Journal of Policy Modeling*, *25*, 377–396.

Svensson, L. E. O. (2011). Inflation targeting. In B. Friedman, & M. Woodford (Eds.), *Handbook of monetary economics* (pp. 1237–1302). Elsevier.

Tanuwidjaja, E., & Choy, K. (2006). Central bank credibility and monetary policy in Indonesia. *Journal of Policy Modeling*, *28*, 1011–1022.

Us, V. (2004). Inflation dynamics and monetary policy strategy: Some prospects for the Turkish economy. *Journal of Policy Modeling*, *26*, 1003–1013.

Us, V. (2007). Alternative monetary policy rules in the Turkish economy under an inflation-targeting framework. *Emerging Markets Finance and Trade*, *43*(2), 82–101.

Please cite this article in press as: Ayres, K., et al. Does inflation targeting lower inflation and spur growth? *Journal of Policy Modeling* (2014), http://dx.doi.org/10.1016/j.jpolmod.2012.12.008