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The macroeconomic performance of the inflation targeting policy: An approach based on the Efficient Frontier

Abdelkader Aguir ¹ Mounir Smida²

Abstract

In this paper, we study the economic performance of a monetary policy and in particular the inflation targeting policy. The policy of inflation targeting is a monetary regime which seeks inflation. His practice was marked by a high stability observed. Many searches are interested in this issue without being able to even reach an ultimate consensus. The main idea of this work is to consider the inflation targeting policy as economically efficient when it generates a stable monetary environment .At first, we discusses the theoretical framework of the inflation targeting relating to these conceptual and analytical aspects that seem to complete the reflection on the earlier antinomy. The analysis then focuses on empirical verification. In drawing on the work of Cecchetti & Krause (2002), Flores-Lagoons& Krause (2006), Mishkin & Schmidt Hebbel (2007) and Aguir & Smida (2015), we estimate efficient frontier: inflation variability - output variability, which allows us to deduce the measurement of economic performance and monetary policy efficiency measure.

Keywords: Inflation targeting, monetary policy, efficiency of monetary policy, economic performance.

1. Introduction

The growing interest of central banks in industrialized and emerging countries for Inflation Targeting goes naturally hand in hand with an intensification of academic research about it. The first parts of the work, essentially descriptive, have endeavored to discuss the various operational aspects of monetary policy, and the terms of its effectiveness and viability. Consequently, the second generation of work has in turn

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sought to test empirically the benefits in terms of macroeconomic performance of the adoption of Inflation Targeting .Long focused on industrialized economies because of a lack of a certain hindsight concerning emerging countries , these empirical studies have subsequently concentrated mainly on macroeconomic performance of Inflation Targeting at the heart of emerging economies whose adoption was a debate within the academic community for these category of countries . While these studies find mixed result, even contradictory in the case of industrialized countries, the results seem rather to highlight the positive impact of the adoption of Inflation Targeting on macroeconomic performance of emerging countries. In the sense that countries which have adopted Inflation Targeting would show macroeconomic performance superior in terms of level and volatility of inflation in particular, to the economies which would pursue another strategy of monetary policy. As an important component of economic policy, monetary policy decisions affect clearly the price levels and internal and external equilibrium. The monetary policy framework has experienced considerable development from discretionary policy to policies rules. Since the publication of the work of Kydland and Prescott (1977), it has been shown that discretionary monetary policies engender inflationary bias related to temporal inconsistency problems. Therefore several studies have shown the superiority of political rules, which it evolved from monetary aggregates targeting (Friedman, 1984) to policies targeting of variables reflecting the objectives of monetary policy (Taylor, 1993 ; Svensson and Rudebush, 1998). The inflation-targeting regime is a strategy for conducting monetary policy with the explicit objective to maintain price stability and sets a target for the development of the rate of inflation. It is identified from a general rational expectations model based on the transmission mechanism of monetary policy. For many countries, the introduction of a policy of inflation targeting has had a real impact on the level and expectations of inflation and other macroeconomic variables such as output and the exchange rate (Mishkin, 1992, Schmidt-Hebbel 2002, Truman, 2003,Mishkin and Schmidt-Hebbel, 2007). This work focuses on the assessment of the experience of countries that have adopted the inflation targeting since the 1990s, focusing on both performances on the benefits and the potential costs of the adoption of such a monetary policy framework and try to draw lessons from the twenty years of practice of this regime. This paper is divided into two main parts. It discusses the theoretical and operational aspects of inflation targeting and the efficiency of monetary policy under this regime. Thus, as a first step, analysis will mainly focus on

conceptual and analytical aspects of inflation targeting by drawing the theoretical building on the subject developed in large part by F. Kydland and E. Prescott, R. Barro and D. Gordon, J. Taylor, L. Svensson, L. Ball and N. Sheridan, M. Woodford and B. Bernanke, F. Mishkin and others. The last axis is to evaluate and analyse the efficiency of monetary policy under inflation targeting regime. In drawing on the work of Cecchetti and Krause (2002), Flores-lagoons and Krause (2006) and Mishkin and Schmidt Hebbel (2006), we estimate efficient frontier: inflation variability - output variability, which allows us to deduce the measurement of economic performance and monetary policy efficiency measure. The next section discusses the related literature of inflation targeting. Section 3 presents the empirical analysis and shows the results and section 4 concludes.

2. Stability, Economic Growth: Related Literature.

The first work of literature that has made a significant change in the relationship between volatility cycles and economic growth is that of Ramey and Ramey (1995). Using a sample of twenty four countries they calculated the correlation between growth and volatility. Afonso and Furceri (2010) studied macroeconomic growth using a sample of 34 countries and affirm the negative link between volatility and economic growth cycles. In the same circumstances the work of Dincer & Zafer (2012), Jetter et al (2013), Antonakakis & Badinger (2015) Joya (2015) reached similar results and that the volatility of the cycles, whatever their have negative effects on economic growth.

Indeed, a macroeconomic framework is considered stable if it is stable monetary policy characterized by low and stable inflation, Ftiti (2010). Aizenman & Pinto (2005), Hnatkovska & Loayza (2005) studied the issue of macroeconomic policy in connection with growth and development. The authors showed that a stable macroeconomic environment is needed to support sustainable growth and achieve good economic performance. According to the theory of growth, high inflation led to a decrease in the accumulation of capital which negatively affects economic growth (Ftiti 2010). Beaudry et al. (2001), Alba et al (2011), Aisen & Veiga (2013), Knut et al (2013) confirm in their studies that a stable monetary level generates sustainable growth.

The question of the economic performance of inflation targeting policy is at the heart of the economic debate in recent years. Our objective is attempting to measure economic performance of monetary policy in the economic literature that a stable monetary environment reflects a good macroeconomic performance.

The Inflation targeting policy is economically efficient, when it generates an increased degree of stability in the macroeconomic environment. And establish a relationship between stability and performance.

Stable monetary environment \implies low degree of uncertainty \implies degree of interaction between the variables high \implies convergent responses to shocks.
Aguir.A(2014)

We will try in what follows to judge the performance of the inflation targeting policy based on the effect of macroeconomic stability and in particular the environment of monetary policy.

In what follows, we calculate other performance measures to identify the contribution of the effectiveness of monetary policy in the differences of macroeconomic performance between countries with the CI and those without the CI.

2. Method of estimation:

In drawing on the work of Cecchetti & Krause (2002), Flores-lagoons & Krause (2006), Mishkin & Schmidt Hebbel (2006), and Aguir & Smida (2015), we estimate the border of efficiency: inflation variability - variability of output, which allows us to deduce the measures of economic performance and efficiency measures of monetary policy. The performance of monetary policy can be estimated by using the principle of arbitrage between the variability of inflation and the variability of output practiced by those responsible for monetary policy. This arbitration allows us to construct an efficiency frontier.

The efficiency frontier is also an indicator of the degree of optimality of monetary policy, Aguir & Smida (2015).

When monetary policy is sub-optimal, the economy will be exposed to greater volatility of output and inflation, it will be located at a significant distance from the border. Movement towards the efficiency frontier indicates an improvement of monetary policy.

This feature of the efficient frontier allows us to construct measures of economic performance and the performance of the monetary policy in order to distinguish the contribution of the efficiency of monetary policy than the variability of shocks in the differences observed in macroeconomic performance between countries without the CI and those with the CI.

We begin by obtaining a measure of the performance of an economy in terms of output-

inflation variability. Specifically, we derive a standard conventional goal of a Central Bank which is the minimization of the following loss function, determined by quadratic deviation of the inflation of the output:

$$L = \lambda (\pi_t - \pi_t^*)^2 + (1 - \lambda) (\gamma_t - \gamma_t^*)^2$$

With:

π_t is the rate of inflation;

π_t^* is the target of inflation;

γ_t is the logarithm of the output level;

γ_t^* is the target or the trend level of output.

λ is the weight attached to the inflation.

The change in performance due to the change in the size of the shock is derived from the following combination of optimal variances of output and inflation:

$$S = \lambda (\pi_t - \pi_t^*)_{opt}^2 + (1 - \lambda) (\gamma_t - \gamma_t^*)_{opt}^2$$

With $(\pi_t - \pi_t^*)_{opt}^2$ and $(\gamma_t - \gamma_t^*)_{opt}^2$ are the deviations of inflation and output relative to their targets under an optimal policy. S is a measure of the variability of supply shocks. For example, a negative difference of this measure between countries without the CI and the country with the CI, $\Delta S = S_{NT} - S_{IT}$, indicates that the shocks hitting the country without the CI are smaller than the shock of the country with the CI.

Finally, we are evolving the efficiency of monetary policy by measuring how the current performance is achieved compared to the optimal policy (IE, the distance to the border of efficiency). We call this measure E and the set thus:

$$E = \lambda [(\pi_t - \pi_t^*)^2 - (\pi_t - \pi_t^*)_{opt}^2] + (1 - \lambda) [(\gamma_t - \gamma_t^*)^2 - (\gamma_t - \gamma_t^*)_{opt}^2]$$

Thus the smallest value of E indicates that the monetary performance is closer to the optimal policy. The differences in the efficiency of policy between countries without the CI and those with the CI are obtained by calculating $\Delta E = E_{NT} - E_{IT}$; a negative value of ΔE implies that countries without the CI policy is more efficient.

To identify the impact of CI, our approach is to compare the performance between seven groups for the 13 emerging countries practicing the inflation targeting and 12 emerging (appendix 2) countries practicing other monetary policies: (appendix 1 & 2).

- countries with CI before CI # countries with CI after CI,
- countries with CI before CI # countries with CI after CI (convergence period),
- countries with CI before CI # countries with CI after CI (period of stationarity)
- country without CI before 1999: 4 # country without CI after 1999: 4,
- countries with CI after the CI # country without CI after 1999: 4,

- countries with CI after CI (convergence period), # countries without CI after 1999: 4;
- countries with CI after CI (period of stationarity), # country without CI after 1999: 4
- countries with CI after period of crisis (2008- 2015), # country without CI after period of crisis (2008-2015)

3.2. Estimation results:

Using the method for estimating the panel dynamic ordinary least square (Pooled OLS).

Table 1 report the estimated measures of economic performance (L), the efficiency of monetary policy ϵ and variability of supply shocks (S) for each pair of groups of countries.

The first line of table 1 indicates the action estimated for countries engaged in targeting inflation before and after the adoption of this plan. In these countries, economic performance (L) improved after the adoption of the inflation targeting. This performance gain is reflected by the negative value $\Delta L = -5,40$. The defalcation of the gain shows that it comes at a rate of 84% of positive supply shocks and 16% of the efficiency of monetary policy under inflation targeting regime.

This proportion has improved during the period of convergence for the efficiency of monetary policy, as saying that that during the period of the stationary positive supply shocks has improved and gain the efficiency of monetary policy remained stable.

Countries not practicing inflation targeting have experienced economic inefficiency during the period [2000 - 2015] compared to the initial period [1990-1999]. This inefficiency valued at $\Delta L = 68.99$ is due to adverse supply shocks and a loss of efficiency of the monetary policy pursued by these countries (table 1, 4th line). The comparison of the two groups of countries during the period of post targeting shows that countries pursuing inflation targeting have experienced a better economic performance. This difference in performance is partly explained by a good monetary policy, especially during the period of convergence targets.

Table 1: calculation Loss L, S and E

	L1	E1	S1		L2	E2	S2	Variations		
								L2-L1	E2-E1	S2-
Countries with IT, before IT	26.34	3.61	20.21	Countries with IT, after IT	17.89	2.18	17.12	-6.40	-1	-5.40
Countries with IT, before IT	26.34	3.61	20.21	Countries with IT, convergence period	28.09	1.32	26.77	3.68	-1.25	4.93
Countries with IT, before IT	26.34	3.61	20.21	Countries with IT, stationarity period	4.60	1.38	3.22	-19.81	-1.19	-18.62
Country without IT, before 2000:1	8.65	2.77	5.88	Country without the IT, before 2000:1	61.31	7.64	43.19	68.99	2.13	66.86
Countries with IT, after IT	18.01	1.58	16.43	Country without the IT, before 2000:1	61.31	7.64	43.19	59.63	3.32	56.31
Countries with IT, convergence period	28.09	1.32	26.77	Country without the IT , before 2000:1	61.31	7.64	43.19	49.55	3.58	45.97
Countries with IT, stationarity period	4.60	1.38	3.22	Country without the IT, before 2000:1	61.31	7.64	43.19	73.04	3.52	69.52
Countries with IT, Period of crisis 2008:1	7.54	1.04	5.47	Country without the IT, Period of crisis 2008:1	52.87	2.83	61.68	73.04	3.52	69.52

The signs (-) means a gain in performance

The signs (+) means a loss of performance

Conclusion

The inflation targeting is a monetary policy adopted since 1990. Empirical studies have so far been largely focused on developed countries, as these countries which for the most part, have adopted inflation targeting in the early 90s They suggest that this strategy was coupled with an improved economic performance. His justifications should in fact be translated in practice by an emerging credibility of cultures, transparency and good communication during the implementation of the inflation targeting rule. However, the implementation of inflation targeting can not perfectly apply if certain conditions are not met beforehand, including the independence of the central bank, the existence of appropriate technical structure, stability macroeconomic framework and a sound financial market. Following the literature review, the performance of the inflation targeting policy was judged on the basis of the macroeconomic stability of the effect and in particular the environment of monetary policy. The inflation rate decreased variability was lower and inflation expectations were less strong. This proves that this regime is in favor of economic growth. To ensure that these performance differences are attributable to the choice of the inflation targeting regime, the efficiency frontier were estimated: variability of inflation - variability of output, which allows to deduce measures economic performance and measures the efficiency of monetary policy. Drawing on the work of Cecchetti & Krause (2002), Cecchetti, SG, Flores-Lagunes, A & Krause, S (2006) and Mishkin and Schmidt Hebbel (2007), n shown that this monetary regime is in favor sustainable economic growth and the country's inflation targeting knows more macroeconomic performance than its neighbor of not targeting and that these differences are generally attributable to the choice of the regime.

References

- Aghion, P, Bacchetta. P, Rogoff K (2006). "Exchange Rate Volatility and Productivity Growth: The Role of Financial Development. " NBER Working Paper No. 12117 (March).
- Aguir.A(2014) "Inflation targeting: an alternative to monetary policy" International Journal of Economics and Finance Vol. 6, No. 7, July 2014
- Aizenman, Joshua (2008). "International reserves management and the current account",pp. 435-474, Current Account and External Financing, Santiago, the Central Bank ofChile, Edited by K. Cowan, S. Edwards and R. Valdés.

Aizenman, Joshua and Daniel Riera-Crichton (2008). "Real exchange rate and international reserves in the era of growing financial and trade integration," *Review of Economics and Statistics*, Vol. 90. 812-815.

Arellano, M., and S. Bond, 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58, 277-297.

Ball, Lawrence and N. Sheridan (2005). "Does inflation targeting matter? " In *Monetary Policy under Inflation Targeting*, edited by F. Mishkin and K. Schmidt-Hebbel. Santiago: Central Bank of Chile.

Beaudry P., Caglayan M., Schiantarelli F. (2001) Monetary instability, the predictability of prices, and the allocation of investment : An Empirical investigation using U.K Panel data, *The American Economic Review*, 91, 3, pp. 648-662.

Bernanke B.S., Mishkin F.S. (1997) Inflation targeting : a new framework for monetary policy, *Journal of Economic Perspectives*, 11, pp. 97-116.

Capistrán, C., Ramos-Francia, M. (2010). Does inflation targeting affect the dispersion of inflation expectations? *Journal of Money, Credit and Banking* 42(1), 113-134.

Clarida, Richard H. (2001). "The Empirics of Monetary Policy Rules in Open Economies," *International Journal of Finance and Economics* 6 (315-323). Clardia,

Clardia, Richard H., J. Gali, and M. Gertler (2000). "Monetary Policy Rules and Macroeconomic Stability: Theory and Evidence," *Quarterly Journal of Economics* (January).

Conçalves, Carlos Eduardo S., and João M. Salles (2008). "Inflation targeting in emerging economies: What do the data say? " *Journal of Development Economics* 85, 312-318.

De Mello, Luiz (2008). *Monetary Policies and Inflation Targeting in Emerging Economies* (edited volume). OECD (Paris).

De Mello, Luiz and Diego Moccero (2008). "Monetary Policy and Macroeconomic Stability in Latin America: The Cases of Brazil, Chile, Colombia and Mexico. " In De

Edwards, Sebastian (2006). "The Relationship Between Exchange Rates and Inflation Targeters Revisited," *NBER Working Paper* 12163 (April).

Ho W-M. (1996) The imperfect information, money and economic growth, *Journal of Money, Credit and Banking*, 28, 4, pp. 578-603.

International Monetary Fund (2005). *World Economic Outlook*. Washington, D.C.

Johnson, David (2002). "The effect of inflation targeting on the behavior of expected inflation: evidence from an 11 country panel," *Journal of Monetary Economics* 49, 1521-1538.

Kormendi Roger C., P. Meguire (1985). Macroeconomic determinants of growth : cross-country evidence, *Journal of Monetary Economics*, 16, 2, pp. 141-164.

Leiderman L., Svensson L.E.O. (1995) *Inflation Targets*, London : Centre for Economic Policy Research.

Martin.F (2000), " Term structure of interest rates, monetary rule and identification of shocks activity " CREREG, University Rennes 1

Martin P., Rogers C.A. (1997) *Stabilisation policy, learning by doing, and economic growth*, *Oxford Economic Papers*, 49, pp. 152-66.

Mishkin F. S. (2000) *Inflation targeting in emerging market countries*, NBER Working Paper, 10646.

Mishkin, F. S. (2004). "Can inflation targeting work in emerging markets? " NBER Working Paper No. 10646 (July).

Mishkin, S. and Schmidt-Hebbel, Klaus (2007). "Does inflation targeting make a difference? " NBER Working Paper 12876.

Ravenna, Federico (2008). "The Impact of Inflation Targeting: Testing the Good Luck Hypothesis." Mimeo. University of California, Santa Cruz, Department of Economics.

Rose, Andrew (2007). "A stable international monetary system emerges: Inflation targeting is Bretton Woods, reversed. " *Journal of International Money and Finance* 26,663-681.

Schmidt-Hebbel, Klaus and Alejandro Werner (2002). " Inflation Targeting in Brazil, Chile and Mexico: Performance, Credibility, and the Exchange Rate, " *Economía* (Spring), 31-89.

Appendix

Appendix 1: Table1.Period pre and Post inflation targeting

IT countries	Period Pre targets		period Post Ciblage			
			Period of convergence targets		Period of stationarity	
Czech Republic	1990 :Q1	1997 :Q4	1998 :Q1	2004 :Q4	2005 :Q1	2015 :Q4

Korea	1990 :Q1	1998 :Q1	1998 :Q2	2004 :Q4	2005 :Q1	2015 :Q4
Poland	1990 :Q1	1998 :Q4	1999:Q1	2004 :Q4	2005 :Q1	2015 :Q4
Brazil	1990 :Q1	1999 :Q1	1999 :Q2	2004 :Q4	2005 :Q1	2015 :Q4
Chile	1990 :Q1	1999 :Q2	1999 :Q3	2004 :Q4	2005 :Q1	2015 :Q4
Colombia	1990 :Q1	1999 :Q2	1999 :Q3	2004 :Q4	2005 :Q1	2015 :Q4
South Africa	1990 :Q1	1999 :Q4	2000:Q1	2000 :Q4	2001 :Q1	2015 :Q4
Thailand	1990 :Q1	2000 :Q1	*	*	2000 :Q2	2015 :Q4
Mexico	1990 :Q1	2000 :Q4	2001:Q1	2002 :Q4	2003 :Q1	2015 :Q4
Hungary	1990 :Q1	2001 :Q2	2001 :Q3	2004 :Q4	2005 :Q1	2015 :Q4
Peru	1990 :Q1	2001 :Q4	2002 :Q1	2004 :Q4	2005 :Q1	2015 :Q4
Philippines	1990 :Q1	2001 :Q4	2002 :Q1	2003 :Q1	2003 :Q2	2015 :Q4
Turkey	1990 :Q1	2005 :Q4	*	*	2006 :Q1	2015 :Q4

Source for IT start dates: Mishkin and Schmidt-Hebbel (2007)

Appendix 2: Emerging Markets Sample

IT countries	Start of Inflation Targeting Regime	Non-IT countries
Brazil	1999Q1	Argentina
Colombia	1999Q1	Indonesia
Czech Republic	1998Q1	Jordan
Hungary	2001Q1	Malaysia
Israel	1992Q1	Morocco
Korea	1998Q1	Uruguay
Mexico	1999Q1	Paraguay
Peru	1994Q1	Georgia
Philippines	2001Q1	Croatia
Poland	1998Q1	Bulgaria
Thailand	2000Q1	Bolivia
South africa	2000Q1	Tunisia
Turkey	2006Q1	