Research Paper Economics

Volatility of Exchange Rates Under Inflation Targeting: A Broader Perspective in Emerging Market

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ABSTRACT

The objective of this paper is to examine whether or not the adoption of inflation targeting (IT) reduces exchange fluctuation and induced economic growth in emerging market. Our research will focus on the conduct of monetary policy under inflation targeting, with respect to fluctuations in the exchange rates. We show that the role of the exchange rate is more limited in emerging countries not adopted inflation targeting. While the impact of exchange rates on inflation and on output is relatively strong in economies that not adopted this monetary regime.

KEYWORDS Inflation targeting, Exchange volatility, Economic growth, Emerging markets.

Introduction

Since the first adoption of inflation targeting (IT) by the New Zealand (1991), this topic has become very attractive for Central Banks to give salient regime of floating exchange rates. Since then, the number of emerging countries that have adopted this framework has increased. Theoretically, under inflation targeting can be characterized by three important elements (Svensson (1997)), namely the announcement of a numerical target, the implementation of a policy based on targeting and forecasting high degree of transparency. Recently, there are about thirty Central Banks around the world have adopted this monetary strategy. But it is still difficult to know how fluctuations in the exchange rate must be taken into account in the decisions of the monetary authorities under a regime of inflation targeting.

Several studies have shown that the weak impact of exchange rate on domestic prices (Taylor (2000), Gagnon and Ihrig (2004) and Choudhri and Hakura (2006)), is caused mainly by the decline in the exchange rate pass through which is due to the inadequacy of credibility of monetary policy.

The economic literature showed that flexible inflation targeting limited the variability of inflation, the variability of output gap and the real exchange rate (Svensson (1997)). In another context, Aghion and al. (2009) showed that exchange rate volatility reduces productivity in developing countries. They concluded that the volatility of exchange rate has a negative impact on the macroeconomic variables in industrialized countries. They add that the majority of developing countries have practiced a mixed strategy. Recently, Ghosh (2013) showed that an increase in exchange rate flexibility is found in inflation targeting countries. Indeed, until now the empirical studies have not provided convincing answers about the role of the exchange rate under IT regime. Moreover, few studies have analyzed the relationship between inflation targeting and exchange rate despite its importance. As well as the adoption period is insufficient to detect the effect of the exchange rate under (IT) framework. Based on these results, we try to establish empirical studies that allow providing robust answers to show the important role of exchange rate under (IT) framework.

The aim of this paper is to check whether the adoption of (IT) is effective in reducing the volatility of exchange rates. However, we investigate the volatility of exchange under inflation targeting framework, distinguishing between periods (before IT and after IT regime).Thus, we hope to achieve two goals in this work: one is to contribute to the economic literature on the topic; and the other is to have a more reliable yardstick available in order to explore the effect of exchange rate in emerging countries on the activity during periods of adoption of this framework. We structure the paper such that section two present empirical analysis and introduces the dataset. In section three gives the estimations results. Finally, we give the conclusion. The paper has additional tables in the appendices.

2. Empirical analysis

2.1. Theoretical methodology in monetary policy

To study the impact of inflation targeting on exchange volatility, we use a model recently developed by Beckmann, Belke and Kühl (2011) that address one methodology well known in the literature (Dornbusch (1976), Frenkel (1976), Kouri (1976), Bilson (1978)).

The exchange rate is determined as follows:

$$E = \alpha + \beta_1 m - \beta^f_1 m^f - \beta 2\, y + \beta^f_2 y^f + \beta_3 r - \beta^f_3 r^f \quad (1)$$

The terms (β) represent the elasticities and accordance with the structure of the function of money demand: $\beta = \beta_1 = \beta^f_1 = 1$, where (α) is a constant term and under the original form of the model (α) is equal to zero. (y), (m) and (r) are, respectively, the logarithms of real income, money supply and interest rates expressed in percentage. Than the monetary policy yield an exchange rate determination equation in this form: $E = (m-m^f, y-y^f, r-r^f)$ (4)

2.2. The econometric methodology

Data and estimations

Our empirical work is based on quarterly panel data so as to distinguish between group characteristics, respectively, of inflation targeting and non inflation targeting emerging market. For robustness reasons, different country samples are being used. The first country sample includes the 12 inflation targeting countries. Our dataset consists of 24 emerging market examined over the period 1980:1-2012:4. According to IMF researchers, 12 of the emerging member countries had adopted IT (with flexible exchange rates) by 2007, called ITers or (treatment group) and 12 non ITers or (control group) (Table A in appendix). Accordingly, we estimate treatment effect of IT upon macroeconomics variables by the chosen conservative starting dates of IT. (Table B in appendix). In this regard, we use the exchange rates variable E (SDR) as a dependent variable, GDP growth representing economic activity, inflation rate (calculated with consumer price index) and countries that adopt an inflation targeting framework take one as Dummy and zero otherwise in equation. We estimate the average of inflation and output growth. The volatility of exchange rates is calculated as the standard deviation from the average. For robustness reason, we adopt two different periods (pre-targeting periods and post-targeting periods. Database is from the IMF (International Financial Statistics (IFS)).

3. Estimations results

Table 1 and 2 presents the results for all emerging market used, respectively estimation of exchange rates volatility on inflation and output growth. The estimation results yields plausible estimates of the coefficients in the second period of estimations (after IT regime) and for the most part, the coefficients are statistically significant at conventional levels. By contrast, the analysis of the coefficients reported in the first period (before IT regime) are statistically non significant (IT dummy appears with a negative sign and no significant) providing strong evidence of the volatility of exchange rate when the (IT) regime is non implemented. These results confirm the work of Lin (2010) and Rose (2007), which suggests that exchange rate volatility is reduced in emerging market economies. A small fluctuation of the exchange rate in (ITers) emerging market is explained by the greater ability of the Central Bank to systematically control the exchange rate. Specific coefficients output growth and inflation are statistically significant. These results show that the non implementation of the policy of inflation targeting in some emerging countries do not call into question the repeated attempts of these countries to reduce inflation, using other policies (monetary aggregate targeting) to counteract rising inflation. These results were confirmed in the work of Lin and Ye (2009), Divino (2009) and Gonçalves and Salles (2008). In other words, institutional reforms are more beneficial in emerging market, although, emerging market have suffered from periods of hyperinflation in the past which might modify results. In general, the results from using quarterly data further demonstrate confirmatory evidence of the presence of stability of exchange rate in emerging market under IT framework.

The results are quite interesting. IT significantly causes exchange rate stability. Known, stable expectations of exchange rates seem to cause negative exchange rate fluctuations. The results are similar to those Edwards (2006) and Aizenman and Hutchism (2011).

Table 1. Estimation of exchange rates volatility Dependent variable: Change in the standard deviation of exchange rates between samples

	Before IT regime	After IT regime
Constant IT Dummy Inflation	1.047** (0.63) -1. 611 (0.21) -0. 174** (0.21)	2.34** (0.47) - 1. 263*** (0.54) -1. 002*** (0.64)
R^2 Observations	0.54 24	0.83 24

Source: Author's estimations. Numbers in parenthesis are standards errors.

*,**,*** respectively denote significance at the 1%,5 % and 10 % levels.

Table 2. Estimation of exchange rates volatility

	Before IT regime	After IT regime
Constant IT Dummy Output growth	2.722*** (0.83) -1. 01 (0.57) -0. 321* (0.44)	1. 94** (0.61) - 0. 033** (0.79) -1. 081*** (0.07)
R^2 Observations	0.41 24	0.59 24

Source: Author's estimations. Numbers in parenthesis are standards errors.

Conclusion

In this work, we focus on the role of the exchange rate into the inflation targeting framework in emerging market. We examine empirically whether or not the adoption of IT reduces volatility of exchange rates, reduced inflation and induces economic growth. The results show that inflation targeting reduces exchange rate volatility and inflation with sustainable growth. Our results suggest that the role of the exchange rate is more limited in emerging countries not adopted inflation targeting and the adoption of inflation targeting by Central Banks in emerging market is often used with other monetary strategy (Aizenman and al. (2008)). Results indicate that external variables play a very important rule in the conduct of monetary policy.

Finally, although several studies find that (IT) in emerging markets performs less well than in advanced industrial countries, in our study, spreads are considerable in both periods before and after inflation targeting. In this regard, according to study of IMF (2005), the adoption of this monetary strategy has achieved a target inflation target that has not been achieved with other monetary strategies.

Appendix

Table A. Country list

Treatment group		Control group	
Brazil	Ghana	Algeria	Morocco
Chile	Philippine	Argentina	Hong kong
Colombia	South Africa	Bulgaria	Iran
Indonesia	South Korea	Jordan	China
Mexico	Thailand	India	Lebanon
Peru	Turkey	Tunisia	Egypt

Source: Lin and Ye (2009) and Roger (2009).

Table B. Emerging inflation targeters along with their starting dates

	Soft IT: Default starting dates	Full Fledged IT: Conservative starting dates
Chile	January 1991	August 1999
South Korea	April 1998	April 1998
Mexico	January 1999	
Brazil	June 1999	January 2001
Colombia	September 1999	June 1999
South Africa	February 2000	October 1999
Thailand	May 2000	February 2000
Peru	January 2002	May 2000
Indonesia	July 2005	January 2002
Turkey	January 2006	July 2005
Ghana	January 2007	January 2006
Philippine	January 2002	January 2007
		January 2002

Source: Author's compilation, Rose (2007) and Roger (2009).

REFERENCES

Aghion, P.,Bacchetta,P.,Ranciere,R.,and Rogoff, K. (2009). Exchange rate volatility and productivity growth: The role of Financial Development. Journal of Monetary Economics, 56(4), 494–513. | Aizenman, J. and Hutchism,M. (2011). Inflation Targeting and Real Exchange Rates in Emerging Markets, 39(5), 712-724. | Beckmann, J., Belke, A. and Kühl, M. (2011). The dollar-euro exchange rate and macroeconomic fundamentals: A time-varying coefficient approach, Review of World Economics, 147, 11-40. | Dornbusch, R. (1976). Expectations and exchange rate dynamics. The Journal of Political Economy, 84(6), 1161–1176. | Ghosh, A. (2013). Exchange Rate Flexibility in Latin America, Journal of Financial Economic Policy, 5(2), 238-250. | Kouri, P. J. K. (1976). The Exchange Rate and the Balance of Payments in the Short Run and in the Long Run: A Monetary Approach. Scandinavian Journal of Economics, 78(2), 280–304. | Lin, S. (2010). On the International Effects of Inflation Targeting. The Review of Economics and Statistics, 92 (1), 195-99. | Petreski, M. (2012). Output Volatilities and Exchange Rate Considerations Under inflation targeting: A Review. International Journal of Economics and Financial Issues, 2(4), 528-537. | Sek, S. K. (2009). Interactions Between Monetary Policy and Exchange Rate in Inflation Targeting Emerging Countries: The Case of Three East Asian Countries, International Journal of Economics and Finance, 1(2), 27-44. | Wei, D. (2013). Do Central Banks respond to Exchange Rate Movement? Some New Evidence from Structural Estimation. The Canadian Journal of Economics, 46(2). |