https://doi.org/10.31743/ppe.17128

Souhila Bouhmidi, Hamza Fekir, Ismail Amani

Effectiveness of Inflation Targeting Strategy in Times of Financial Instability in Emerging Countries

Skuteczność strategii celu inflacyjnego w czasach niestabilności finansowej w krajach wschodzących

Introduction

The credibility of the monetary authority is a mandatory asset that enables it to achieve its objective of monetary stability. Indeed, the main concern of central banks is no longer to reduce inflation but to conduct monetary policy in the context of low and stable inflation to be credible in the eyes of economic agents. To this end, in the search for credibility in its monetary policy, there was an emergence, during the late 1980s, of a new regime called "inflation targeting", whose main objective was maintaining the inflation rate at a low and stable rate.

Moreover, the theory of inflation targeting started with Leiderman & Svensson (1995), Svensson (2002), Bernanke & Mishkin (1997), and Bernanke, Gertler, and Gilchrist (1999). These authors worked on the first definitions, prerequisites, advantages, and disadvantages of the targeting strategy, followed by a growing number of researchers who have worked on this topic.

Furthermore, this new strategy of "inflation targeting" owes its emergence to the development of the New Keynesians on expectations. The New Keynesian synthesis makes the expectations of private agents and the central bank a major issue in monetary policy (Woodford, 2003). Indeed, to manipulate expectations, the conduct of monetary policy must be made more "transparent and independent". In this context, an inflation-targeting monetary policy regime emerged in 1989 in New Zealand and was followed by an increasing number of central banks.

It should also be noted that central banks practicing the inflation targeting strategy allow themselves to have a broader view of the economy in its monetary

sphere and the real economy through economic stability. (Fouejieu A., 2012). In other words, this strategy gives the country an opportunity for efficiency in monetary stability and economic growth.

On the other hand, monetary history teaches us that the financial environment is characterized by a repetitive effect of instability. Hence, there is a need to be vigilant and cautious in the choice of monetary strategy. There are many studies on the effectiveness of the monetary strategy of inflation targeting, without being precise in the characteristic of the period studied (period of financial stability or instability).

In this article, we aim to provide answers to the following questions: Does the monetary strategy of inflation targeting prove its effectiveness in economic performance during financial instability? In other words, is inflation targeting the right preventive remedy for the central bank to face a financial crisis?

Our problem requires imposing two following assumptions:

1. The monetary strategy of inflation targeting has proven its effectiveness in economic performance in many countries. In particular in terms of inflation control.

2. Inflation targeting is a strategy considered effective in an environment characterized by financial stability ahead of a financial crisis.

This study aims to estimate the effectiveness of the new monetary strategy of inflation targeting in an environment characterized by financial instability. We applied the following methodology to answer our research problem. Firstly, we present a literature review on the inflation targeting strategy. Indeed, this passage exposes the strategy in several aspects: the definition, advantages and disadvantages attributed to adopting this strategy. Also, the set of prerequisites deemed indispensable for the installation and success of inflation targeting was cited. Secondly, we present the debate that has developed around the strategy's performance, mainly in periods of instability. Finally, our estimate of the effectiveness of inflation targeting during instability is presented, and we have chosen to study it for a panel of emerging countries by adopting a panel economic model.

1. Overall approach to the monetary strategy of inflation targeting

Inflation targeting owes its emergence to the New Keynesian development of expectations. The New Keynesian synthesis makes the expectations of private

agents and the central bank a major issue of monetary policy and describes the monetary authorities as anticipation managers.

Monetary policy must be made more transparent and independent to influence these expectations. In this context, the inflation-targeting monetary policy regime was introduced in New Zealand in 1989, followed by a growing number of central banks. It can now be described as a monetary strategy resulting from the desire of the monetary authorities of countries and currency areas to control or even minimise inflation, based essentially on expectations.

1.1. Definition of the inflation targeting strategy

Inflation targeting is a type of monetary policy regime first introduced in 1989 by New Zealand, followed by a growing number of developed, emerging, and developing countries.

The literature on this strategy provides a wide range of definitions and reflections, each in its own way and with its argument (Leiderman & Svensson, 1995; Svensson, 2002).

Mishkin (2000) defines inflation targeting as a benchmark in the academic world. Indeed, the author considers that the inflation targeting strategy is based on five foundations: (i) a public announcement of a formal inflation target, which may take the form of a figure, a fluctuation range, or a midpoint in a target zone, and is fixed for one or more time horizons; (ii) an explicit commitment to a low and stable inflation rate as the ultimate objective of monetary policy; (iii) central bank independence in the choice of instrument and central bank accountability for achieving the inflation target; (iv) perfect knowledge of the functioning of the economy and of the transmission mechanisms of monetary policy with highly developed modelling and inflation anticipation capabilities; (v) good "internal and external" communication between the monetary authorities and private agents concerning, in particular, the choice of objectives and instruments of monetary policy.

Overall, according to the review, the inflation targeting strategy can be said to be a monetarist type of monetary policy but with a discretionary margin, where the central bank, being independent, is responsible for posting a numerical inflation rate based on expectations. This strategy reflects a high level of credibility of the central bank reinforced by its transparency and good internal and external communication.

1.2. Institutional and structural conditions for implementing the inflation targeting strategy

To adopt the inflation targeting strategy, the country has to fulfil certain conditions or institutional and structural prerequisites for inflation targeting that have been addressed in the work of Mishkin (2000) and Batini & Laxton (2007). There are five conditions:

- central bank independence,
- transparency of the central bank,
- a well-functioning financial system,
- advanced technical infrastructure,
- a flexible exchange rate regime.

1.2.1. The independence (autonomy) of the central bank

A central bank is said to be autonomous or independent when it is free in the implementation of the instrument for the conduct of monetary policy. In other words, it does not take into account external pressures. The central bank must, therefore, have operational independence, which means that it must have the independence and freedom to decide on the monetary instruments of the monetary policy regime and financial and administrative autonomy in order to avoid time inconsistencies.

1.2.2. Central bank transparency

Adopting an inflation-targeting monetary regime by the central bank should result in practical "transparency" (which creates credibility concerning monetary policy) on the part of a central bank that explicitly commits to a certain inflation target. How? Transparency plays a very important role in the success of the strategy. On the one hand, it signals to the markets that the central bank is accountable for the results it achieves, promoting greater discipline in the design and implementation of its policy. On the other hand, transparency plays a role in monetary targeting as policy objectives, including cross-media targets, are published. Thus, all strategies are explicitly laid out before the public.

1.2.3. A flexible exchange rate regime

A flexible exchange rate regime, one of the fundamental conditions in the literature for implementing the inflation targeting strategy, is adopting a flexible exchange rate regime. This condition is estimated to rule out any intervention by the central bank on an objective other than price stability. Indeed, by adopting the flexible exchange rate regime, the central bank would be oriented towards its primary objective of price stability and rule out any type of intervention that could complicate the management of the inflation targeting strategy.

1.2.4. Advanced technical infrastructure

One of the properties of the inflation targeting strategy is future inflation based on expectations. In addition, the central bank must have reliable forecasts. In order to do so, it must have a well-developed infrastructure in terms of data collection capacity to be able to exploit these data efficiently and define forecasting models.

1.2.5. A well-functioning financial system

The relationship between monetary policy and financial and banking markets is strong and conditional. Therefore, these markets must be stable to minimise the risks of monetary policies.

Table 1, by A. Aguir (2011), " Inflation targeting: an alternative for monetary policy," includes all the institutional and structural conditions required to make the monetary strategy of inflation targeting more effective.

Table 1: Institutional requirements for inflation targeting

Institutional conditions	Content
Instrument independence	The central bank must be autonomous in its choice of monetary policy instruments. The central bank must have at least one main instrument to: inform the markets about its desired monetary policy stance, influence inflation expectations
Joint responsibility for the announcement of the inflation target	The adoption of an inflation target can be announced by the central bank or announced by the government or jointly between the central bank and the government
Communication	The central bank must communicate clearly and frequently with the government the market and the public. This requirement is often akin to a transparency objective

Institutional conditions	Content
Exchange rate flotation	The implementation of inflation targeting cannot be designed without moving to a flexible exchange rate regime that allows domestic monetary policy to determine monetary conditions
Harmonisation with the policy	Monetary policy should not be subject to fiscal imperatives. A sound fiscal position enhances the credibility of inflation targeting
Public support	The public should perceive the strategy adopted as the most appropriate

Source: Aguir, 2011.

1.3. Advantages and disadvantages of the inflation targeting strategy

The set of institutional and structural prerequisites has been predominantly advantageous for the inflation targeting strategy. However, this strategy is not without its drawbacks. In this section, we discuss the advantages and disadvantages estimated by the literature.

Advantages

Inflation targeting combines several important advantages that previous monetary policies have failed to achieve:

– Credibility and transparency of the central bank – inflation targeting policy relies on the existence of multiple meetings, as well as internal and external communications, between the monetary authorities and the public.

– The public will, therefore, have more confidence in the actions of the central bank.

– The central bank's aversion to the objective of price stability – progress in credibility, transparency and communication with the public only increases the central bank's responsibility and commitment to stabilising inflation.

– A possibility to achieve other traditional stabilisation objectives – the theory behind inflation targeting gives an advantage to this strategy, which lies in diversification, i.e. a soft, flexible and not only strict strategy.

– In the current practice of industrialised countries, as far as inflation targeting policy is concerned, all banks, without exception, follow other secondary objectives in addition to their main objective of price stability. Among these secondary objectives, we can mention output stabilization.

– "Domestic shocks" – the monetary regimes that preceded inflation targeting did not take domestic shocks into account. An example that illustrates this thesis is supply shocks when the inflation-targeting country is faced with a supply shock. Monetary policy allows inflation to deviate from its target in response to this supply shock.

– Flexibility of the strategy: the inflation targeting strategy has the ability to adapt to and give optimal responses. It explains that the strategy is not tied to a single variant. On the contrary, inflation targeting allows the monetary authorities to use any variable and any information that can ensure price stability. All these factors reflect the flexibility of inflation targeting and, therefore, its ability to conduct optimal responses.

– The broad scope of the inflation targeting policy – it should be noted that the inflation targeting strategy acts in the medium term and not the short term. This characteristic gives it certain advantages: firstly, it avoids the frequent variations in monetary instruments which can occur if one acts in the short term; the second advantage consists of avoiding losses of credibility following transitory shocks which have effects on the short term.

Despite these many advantages, the inflation targeting strategy is not without its weaknesses, especially for emerging inflation targeting countries.

Disadvantages

The literature on the inflation targeting (IT) strategy elaborates on a number of benefits obtained through its adoption. Nevertheless, the adoption of this regime is not without effect on the economy. The following disadvantages of IT can be identified:

– A likely recession for emerging countries – in practical terms, the introduction of inflation targeting is accompanied by a disinflationary period. Although this reduces inflation, it leads to a dramatic fall in the level of output. Indeed, inflation-targeting countries initially risk triggering a recession. The adverse effect on output ends once a low level of inflation has been established.

– A "long" credibility-building phase – inflation targeting does not transmit immediate signals. This can lead to a relatively long period before credibility and confidence are established.

A hard rule, mentioned by Friedman, is the fact that policy makers follow a hard rule in inflation targeting policy. The authors criticise this regime for

not providing the monetary authorities with sufficient discretion to deal with unpredictable circumstances.

Mishkin (2000) insists on the influence of fiscal policy on monetary policy, as some emerging market countries pursue an irresponsible fiscal policy in parallel with inflation targeting. Indeed, in the long run, the arrival of a very large fiscal deficit is monetised. As a result, public debts explode and lead to higher inflation. This leads to the collapse of the inflation targeting policy. The second develops in the case of a dollarised country. In countries adopting this policy, bank and household debt is denominated in dollars. One of the main features of inflation targeting is the flexibility of the exchange rate. In practice, in the event of a sharp depreciation of the domestic currency, the burden of dollar-denominated debts increases, resulting in a deterioration of the central bank's balance sheets and increased risks of financial crises.

In general, it can be seen that the monetary strategy of inflation targeting develops a significant number of advantages but also some disadvantages for the countries that have chosen to adopt this regime. The main advantages can be summarised in the following triptych: transparency, credibility, communication.

2. The macroeconomic performance of target countries during a period of financial stability and instability – a descriptive analysis

Shortly after the development of the new monetary strategy in the late 1980s, an academic debate spread, with the aim of estimating the performance of this new regime in general, in times of instability in particular. As a result, many empirical studies were made on the effects of inflation targeting on macroeconomic performance, which were mixed in terms of results. Indeed, a comparative study was conducted between a panel of five inflation-targeting countries at the time (Australia, Canada, New Zealand, Sweden and the United Kingdom) and a panel of six non-inflation-targeting industrialised countries. They found that the announcement of an inflation targeting policy significantly reduced expected inflation.

They also concluded that inflation targeting allowed industrialised countries to achieve lower inflation in the long run. However, the same work also argued that inflation targeting in emerging countries is less successful than in industrialised countries, although the declines in the level

of inflation after the adoption of an inflation targeting policy in emerging countries were considerable.

It should be remembered that Fekir and Boulenouar (2015) conducted an econometric study where they investigated the performance of the inflation targeting strategy for a panel of countries, the result of which shows that the adoption of inflation targeting contributes to the strengthening of central banks' credibility, which is manifested in lower inflation and improved economic growth.

Other studies, however, are the opposite of the above results. Ball and Sheridan (2003) found that there was no statistically significant difference in the long run for industrialised countries. This result was affirmed for inflation targeting countries (seven countries) as well as for non-targeting countries (thirteen countries). They also showed an ambiguous effect of the adoption of inflation targeting on the economic performance of emerging countries. They found that the economic environment in the 1990s was relatively stable, and inflation was on a downward trend in both inflation-targeting and non-targeting countries.

On the other hand, empirical work has also attempted to study the performance of the strategy during the commodity price boom of 2006 and the global financial crisis of early 2007. In this regard, one study (Roger, 2010) examined the performance of inflation targeting, for developed and emerging countries, in terms of growth and monetary stability after 20 years of the appearance of inflation targeting strategy. Indeed, he divided his work into two periods: pre-crisis period 1991–2000 and post-crisis period 2001–2009, the results of which are shown in the Table 3.

Table 3: The results of Roger (2000)

Specification	Period 1991–2000		Period 2001–2009	
	Production	Inflation	Volatility of production	Volatility of inflation
High-income inflation targeting countries	Significant increase in production	Inflation down sharply	Low volatility	Low volatility
Low-income inflation targeting countries	Significant increase in production	Inflation down sharply	Slight decline in volatility (stability)	Slight decline in volatility (stability)

Source: authors, based on Roger (2010) analysis.

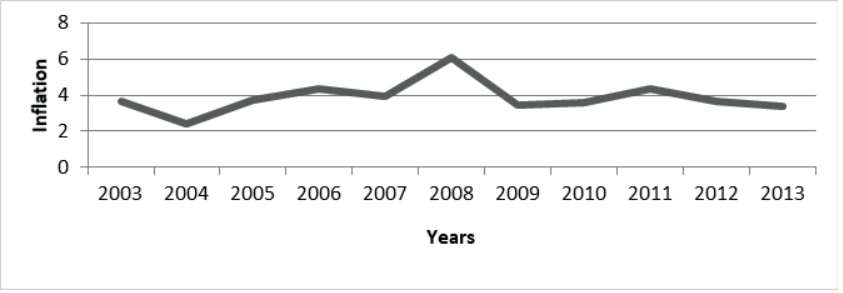
The work of Aguir (2016) concerned a study on the performance of the crisis inflation targeting strategy for emerging market countries. The results showed that there was a significant difference in inflation and growth performance in a global economic environment characterised by an international financial crisis.

In addition, a paper published by the Banque de France studied the characteristics of inflation targeting as a shock absorber in response to large shocks in the form of natural disasters for a sample of 76 countries over the period 1970–2015. The authors concluded that inflation targeting improved macroeconomic performance following such shocks as it reduced inflation, increased output growth and reduced inflation and growth variability compared to alternative monetary regimes.

Thus, we start with a descriptive analysis of the macroeconomic performance, namely economic growth and inflation, in a panel of inflation-targeting countries in the pre-subprime and post-subprime periods over the period 2003–2013.

Firstly, Figure 1 shows that, on average, inflation-targeting countries have a stable average inflation rate over the period studied (2003–2013). This summary confirms the central property of the monetary strategy of inflation targeting, which is the assurance of inflation stability. Secondly, during the crisis (2007–2009), it can be seen that countries using targeting experienced a slight and manageable upward trend in the rate of inflation, with a peak of 6.1% in 2008.

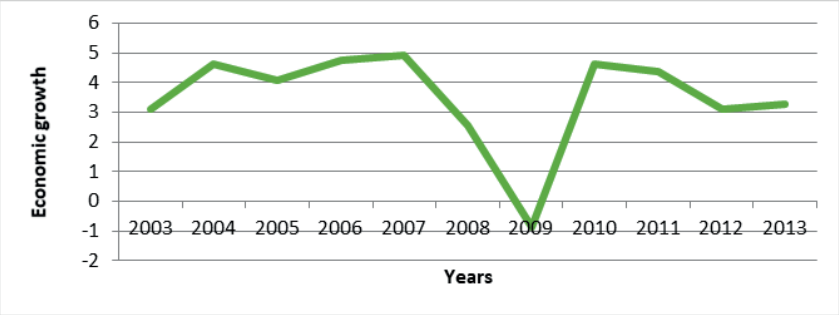
Figure 1: Average inflation rate (in %) before and after the 2007 crisis (inflation targeting countries)



Source: authors, WDI data (World Bank).

With the onset of the subprime crisis in 2007, the entire world was plunged into an unprecedented economic recession. Indeed, the graph (Figure 2) shows that the target countries were not spared the consequences of the crisis. However, an upward trend was observed from 2010 onwards, which suggests that the recovery of economic growth was more or less rapid and effective, with an average economic growth rate of 4%.

Figure 2: Average economic growth before and after the 2007 crisis (inflation targeting countries)



Source: authors, WDI data (World Bank).

In general, it appears from empirical and descriptive studies of inflation targeting countries, as well as the two graphs shown above, that the inflation targeting strategy has worked well in a wide range of countries in periods of stability as well as instability, particularly in terms of inflation rate stability.

3. Credibility of inflation targeting during instability – econometric estimation

From a theoretical point of view, the passage of this global crisis has called for a body of work to measure the effectiveness of the central bank's monetary policies in the face of this shock. Indeed, monetary strategies play an important role in the process of resisting the shock. Thus, a significant amount of work has been done to estimate the strength of inflation targeting monetary policy compared to other policies. The economist confirms that the inflation targeting strategy will only complicate the situation, which is characterised by rising prices, weakening output, and unemployment. In other words, he says that inflation targeting "has failed" as a monetary strategy and adds that it is partly responsible for the subprime crisis. It cites the results of economists who believe that inflation targeting can increase the probability of future crises.

Empirically, and in order to examine the credibility of the monetary strategy of inflation targeting in times of financial instability, we were interested in studying the macroeconomic performance, i.e. the level of inflation and economic growth in an environment of stability and also instability, for a panel of targeting and non-targeting countries. The choice to study the performance of this strategy was

made in view of the impact of the 2007 crisis, which went beyond the monetary sphere and affected the economy in general.

3.1. Empirical model

For our study of the performance of the inflation targeting strategy, we will use a dynamic panel data model with fixed time effects. In particular, the aim is to verify its effectiveness in controlling the inflation rate.

This study is based on an experimental method, difference-in-differences, which allows us to analyse the effect of a treatment, inflation targeting in our study, before and after the economic crisis. This method is used in several analyses that study the effects of crises, notably in the work of Fouejieu (2012) and Ftiti (2010). Furthermore, we will attempt to estimate the performance of inflation targeting through the difference-in-difference method during and before the subprime crisis (2007–2009), using the following variables: GDP inflation, exchange rate, money supply, foreign reserves, and imports.

3.1.1. Study period and sample

The period of our work is from 2002 to 2009. The literature generally estimates the period of the subprime crisis to be from 2007 to 2009, however, the period of crisis estimated in the work would be the same from 2007 to 2009. Furthermore, we take the period of 2002–2006 as the five-year pre-crisis period

Regarding the sample of our study, it consists of two groups: the first is the test group which includes countries practicing the inflation targeting strategy, and the second is the control group consisting of countries practicing another monetary strategy. Nevertheless, the study sample is composed of 24 countries, all of which are emerging market countries.

The test group – inflation targeting countries – includes South Africa (2000), South Korea (2001), Brazil (1998), Poland (1999), Thailand (2000), Chili (2000), Colombia (1999), Czechia (1997), Hungary (2001), Mexico (2002), Peru (2002), and the Philippines (2002). The control group – non-inflation targeting countries – includes China, India, Indonesia, Vietnam, Russia, Nigeria, Paraguay, Serbia, Bulgaria, Singapore, Malaysia, and Egypt.

3.1.2. Methodology

The appropriate approach to measure the difference in the effectiveness of a monetary policy is the so-called difference-in-difference approach (Ball & Sheridan, 2003). Indeed, this estimation method is considered adequate since the crisis can be considered an exogenous shock and treated as an event study.

The estimation model is written as follows:

$$\Delta Y=\alpha+\beta IT+\theta X+\varepsilon$$

with $\Delta Y - \Delta Y = Ycr - Ypre$, it represents the variation of the dependent variable, with *cr* indicating the crisis period and the pre-crisis period.

IT (inflation targeting) – *IT* is a dummy variable taking the value of 1 if the country is inflation targeting and 0 in the opposite case.

X – is the vector of control variables,

ε – the error term.

In order to answer our research problem, the equation can be rewritten in panel form as follows:

$$\Delta LINF_{i,t}=C+\beta_1 LMON_{i,t}+\beta_2 LEXR_{i,t}+\beta_3 LRES_{i,t}+\beta_4 LGDP_{i,t} +\beta_5 LIMP_{i,t}+\beta_6 LINFTAR_{i,t}+\varepsilon$$

with *C* – constant,

INFTAR – a synthetic variable that takes the value of 1 for target countries and 0 for non-target countries,

INF – inflation measured by consumer price index,

MON – money supply measured in constant US dollars,

EXR – the real effective exchange rate,

RES – foreign exchange reserves measured in constant US dollars,

GDP – gross domestic product measured in constant US dollars,

IMP – goods and services importations in constant US dollars.

All variables are in logarithm.

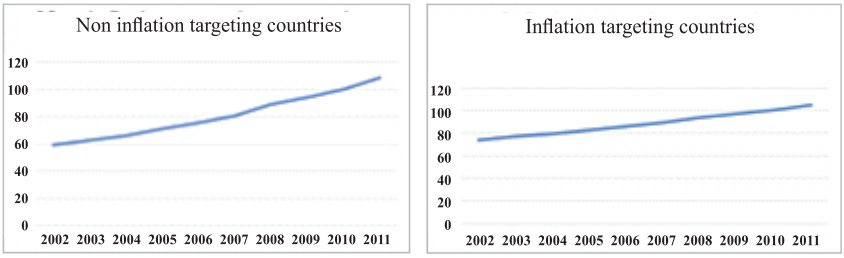
3.1.3. Econometric test result

Our study assesses the economic performance of the inflation targeting strategy before and during financial instability. In other words, the performance of the strategy

in terms of inflation and also in terms of economic growth. The result allows us to estimate the existence of a significant effect or not of the strategy during instability.

Figure 3 represents the trend in the value of inflation for inflation targeting countries as well as for non-inflation-targeting countries. This shows that there is little difference in the change in the value of inflation between the two groups during the estimated crisis period of 2007–2009. In contrast, the targeters faced a larger increase in the value of inflation during the crisis period.

Figure 3: Inflation evolution



Source: authors' estimation.

The average for the period (2002–2006) is 67.01 for non-inflation-targeting countries compared to an average of 79.58 for the same period. In the second period (2007–2009), we observe an average of 88.06 for non-inflation-targeting countries compared to an average of 93.32 for inflation-targeting countries.

• Preliminary tests

First, we will study the existence of a correlation between the explanatory variables and the explained variable, inflation,[1] the results of which are displayed as follows (Table 4):

Table 4: Descriptive statistics

Specification	LIMP	LGDP	LRES	LEXR	LMON	LINF
Mean	24,69	26,08	24,39	4,72	29,43	4,39
Median	24,85	25,93	24,25	4,55	28,998	4,44
Maximum	27,667	29,12	28,32	9,71	35,18	4,59
Minimum	20,16	22,99	20,87	1,11	23,808	3,97

Source: authors' estimation.

[1] Due to the nature of the data, panel data with T=2 and N=10, stationarity, and cointegration tests are not necessary, as the study does not incorporate a long-term effect.

- Test of Chow

The probability of a model with a time fixed effect (Table 5) is (0.00), which is below the critical threshold of 0.05, so the model used must have fixed or random effects. In this case, the Chow test is significant. On the other hand, we have to use the Hausmann test to determine if the chosen model should have random time effects. However, the conditions for making a random effects model are not fulfilled since the number of cross-sections is not higher than the number of coefficients.

Table 5: Fixed effects redundancy test

Test	Probability	d.f.	Statistics
F period	0.0000	(1,40)	47.734705
Chi-square period	0.0000	1	37.701029

Source: authors' estimation.

From now on, we will use the Lagrange Multiplier test for cross-sectional fixed effects since the Chow test was not conclusive for the latter.

- Lagrange Multiplier test

The result shows that the probability of the Breusch-Pagan test equals 0.16 and is therefore greater than 0.05, so the null hypothesis H0 is retained, indicating that the model with random cross-sectional effects does not fit our model equation. Thus, from different tests (Table 6), it appears that the model used must be a model with time fixed effects only.

Table 6: Hypothesis testings

Test	Probability	Result
Breusch-Pagan	(0.1607)	1.967746
Honda	(0.9197)	-1.402764
King-Wu	(0.9197)	-1.402764
Standardised Honda	(0.7219)	-0.588404
Standardised King-Wu	(0.7219)	-0.588404
Gourieroux et al.	–	–

Source: authors' estimation.

- Estimations results

The model is estimated using a Panel EGLS method with period fixed effects and White robust standard errors method. According to model estimation, the result is significant since the probability of the null hypothesis of the F-statistic test, equal to 18.20, is below (Table 7) the significance level (p=0.00<0.05). Thus, the percentage explained by the explanatory variables, adjusted R2, is 72% (R2=0.72). Furthermore, the Durbin-Watson coefficient of 1.93 is close to the value of 2, indicating the absence of a heteroscedasticity problem, which demonstrates the correct identification of the model.

The constant is positive (4,27) and significant (p=0.00<0.05). The variable of interest in our study concerns the effectiveness of inflation targeting in times of crisis; the coefficient of the representative variable of the latter INFTAR is positive (0,10) and significant (0.01). This result indicates that inflation targeting is less effective during economic crises in emerging countries, as it is based on credibility and is highly affected during times of crisis.

Table 7: Estimation results

Variable	Coefficient	Probability
C (constant)	4,27	0,00*
LMON	0,00	0,86
LEXR	-0,01	0,13
LRES	0,04	0,03*
LGDP	-0,05	0,02*
LIMP	0,01	0,06**
INFTAR	0,10	0,01*

Source: authors' estimation.

This result contrast with those of Krusec (2011), Cizkowicz and Rzonca (2015), Duong (2021) or Sethi and Mishra (2024), among others, that consider inflation targeting as efficient during economic crises in emerging countries with different samples. However, inflation targeting inefficiency during crisis has been found in some studies, namely Fouejieu (2017) found that the financial sector is more fragile in inflation targeting countries during the crisis. There are other studies that support a lower effectiveness of inflation targeting in emerging countries, Broto (2011) for Brazil, Nene, Ilesanmi, and Sekome (2022) for South Africa, among others.

Indeed, our results indicate a significant effect concerning control variables. GDP variable (p=0,02) has a negative coefficient (-0,05). This effect is widely accepted

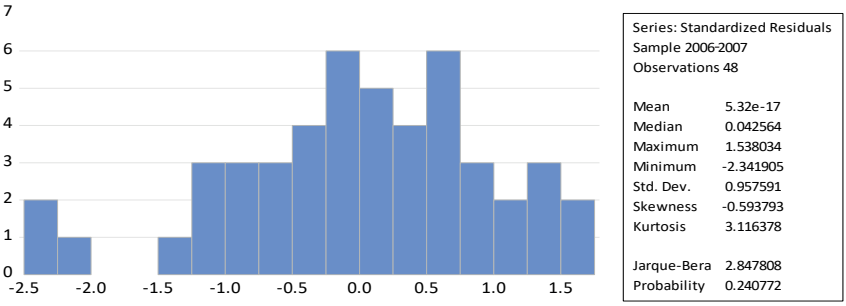
in theoretical and empirical studies as a production increase corresponds to an increase in offer, which make less pressure on products forcing prices to decrease.

Foreign exchange reserves are also significant (p=0,03) with a positive coefficient (0,04). RES being part of money counterpart, an increase translates into money supply and as such is likely to raise inflation. As for importation variable, it has a positive coefficient (0,01) but is only significant at 10% level (p=0,06), as an increase in import prices could lead to a substantial increase in the aggregate price level, thereby pushing the inflation rate up.

- Robustness test

The results of the residuals in our study are broadly within the permissible error range. To test the normality of the residual distribution, we rely on Jarque-Bera (prob=0,24>0,05) we can reject null hypothesis and conclude that residuals have normal distribution (Figure 4).

Figure 4: Residuals normality



Source: EViews results.

Discussion

Despite the increasing adoption of inflation targeting as a monetary stability strategy by many countries its effectiveness during periods of financial instability remains debated given its potential impact on a country's economic and financial stability as well as the international financial market.

During the subprime crisis, a notable shift occurred in the conventional view of countries vulnerable to crisis. Developed industrialized countries were disproportionately affected by the crisis, unlike in previous decades (1980s–1990s)

when less developed countries were most affected. Generally, it was believed that emerging markets were relatively resilient to financial crisis, largely due to the fact that they had consistently accumulated substantial current account surpluses.

As it has been demonstrated in this paper results, inflation-targeting emerging countries have less effectiveness in controlling inflation than non-targeting emerging countries. This can be explained by many factors.

First, inflation-targeting strategy is based on expectations and central banks credibility. Although, during economic crisis, especially during 2007–2008 financial and economic crisis, credibility of central banks was highly affected and thus economic agents expectations (Guler, 2021).

Second, zero lower bound – as a consequence of financial crisis many central banks lowered their interest rates to very low levels which limit monetary policy and inflation targeting primary tool (Kiley & Roberts, 2017). This can even lead to a liquidity trap and deflation pressures.

Third, inflation targeting rigidity can have adverse effects, especially while facing exogenous shocks, during economic crisis. This rigidity leads to further reduction of credibility and lower inflation targeting effectiveness. This is the main reason why economists as Svensson (2010) suggest a flexible inflation targeting by putting some weight on real economy.

Conclusion

The aim of this paper is to investigate the effectiveness of inflation targeting in times of financial instability. The previous literature on the issue reaches mixed conclusions. Some academics argue for the adoption of this strategy by generally believing that it positively affects the level of inflation as well as economic growth. On the other hand, a significant number of works insist on the important risk of this monetary policy on the economic conjuncture and even implicate the inflation targeting strategy in the magnitude of the financial crisis of 2007.

Results, through a comparative econometric study using a difference-in-difference methodology, between inflation targeting and non-inflation targeting emerging countries stipulates that this strategy was ineffective during financial instability period and caused a higher inflation than other monetary policy strategies.

This result can be explained by many factors in theoretical and empirical literature, as some studies focus on emerging countries basing their arguments on higher financial instability on those countries that is accentuated during an economic crisis.

Other studies on inflation targeting characteristics conclude that its effectiveness is reduced during this period as it is based on expectations and credibility both that are highly affected during financial instability. This is even more accentuated when practiced inflation targeting is rigid and cannot adapt to unexpected chocks. Another reason is the very low interest rates during the 2007 crisis that limited, alongside other factors, monetary policy range and even more for inflation targeting.

This result is only true for emerging countries as other studies have confirmed IT effectiveness for developed countries during economic crisis. It is also useful to notice that inflation targeting strategy has been discussed in emerging countries even outside crisis periods with less effectiveness than in developed countries.

Bibliography

Aguir, A. (2016). *Stabilité, croissance économique et ciblage d'inflation*. Université Grenoble Alpes: PhD Thesis.

Ball, L., & Sheridan, N. (2003). Does Inflation Targeting Matter? *NBER Working Paper*, 9577. doi: 10.3386/w9577.

Batini, N., & Laxton, D. (2007). Under What Conditions Can Inflation Targeting Be Adopted? The Experience of Emerging Markets. *Working Papers Central Bank of Chile*, 406.

Bernanke, B., & Mishkin, F. (1997). Inflation Targeting: A New Framework for Monetary Policy? *Journal of Economic Perspectives*, *11*(2), 97–116. doi: 10.1257/jep.11.2.97.

Bernanke, B., Gertler, M., & Gilchrist, S. (1999). The Financial Accelerator in a Quantitative Business Cycle Framework. In: J. B. Taylor, & M. Woodford (Eds.), *Handbook of Macroeconomics* (Vol. 1, part C, pp. 1341–1393). Amsterdam: North-Holland. doi: 10.1016/S1574-0048(99)10034-X.

Broto, C. (2011). Inflation Targeting in Latin America: Empirical Analysis Using GARCH Models. *Economic Modelling*, *28*(3), 1424–1434. doi: 10.1016/j.econmod.2011.02.009.

Cizkowicz, P., & Rzonca, A. (2015). Inflation Targeting and Its Discontents: The Case of Poland. *Acta Oeconomica*, *61*(1), 107–122.

Duong, T. (2021). Inflation Targeting and Economic Performance over the Crisis: Evidence from Emerging Market Economies. *Asian Journal of Economics and Banking*, *6*(3), 337–352.

Fekir, H., & Boulenouar, B. (2015). Ciblage d'inflation et performance des banques centrale. *Revue Algérienne d'Economie et Gestion*, *8*(2), 181–203.

Fouejieu, A. (2007). Inflation Targeting and Financial Stability in Emerging Markets. *Economic Modelling*, *60*(C), 51–70.

Fouejieu, A. (2012). Coping with the Recent Financial Crisis: Did Inflation Targeting Make Any Difference? *Document de recherche du Laboratoire d'Economie d'Orléan*, 5, 1–32.

Fouejieu, A. (2017). Inflation Targeting and Financial Stability in Emerging Markets. *Economic Modelling*, *60*, 51–70. doi: 10.1016/j.econmod.2016.08.020.

Ftiti, Z. (2010). *Politique de ciblage d'inflation règles de conduite, efficacité, performance*. Institut Supérieur de Gestion de Tunis / Université de Lyon: PhD Thesis.

Ftiti, Z. (2010). The Macroeconomic Performance of the Inflation Targeting Policy: An Approach Based on the Evolutionary Co-Spectral Analysis. *Economic Modelling*, *27*(1), 468–476. doi: 10.1016/j.econmod.2009.10.013.

Guler, A. (2021). Does Monetary Policy Help in Anchoring Inflation Expectations? Evidence from Six Inflation Targeting Emerging Economies. *Journal of Central Banking Theory and Practice*, 1, 93–111.

Kiley, M. T., & Roberts, J. M. (2017). Monetary Policy in a Low Interest Rate World. *Brookings Papers on Economic Activity*, 1, 317–396.

Krusec, D. (2011). Is Inflation Targeting Effective? Monetary Transmission in Poland, the Czech Republic, Slovakia and Hungary. *Eastern European Economics*, *49*(1), 52–71.

Leiderman, L., & Svensson, L. (1995). *Inflation Targets.* London: Center for Economic Policy Research.

Mishkin, F. S. (2000). Inflation Targeting in Emerging-Market Countries. *American Economic Review*, *90*(2), 105–109. doi: 10.1257/aer.90.2.105.

Nene, S. T., Ilesanmi, K. D., & Sekome, M. (2022). The Effect of Inflation Targeting (IT) Policy on the Inflation Uncertainty and Economic Growth in Selected African and European Countries. *Economies*, *10*(2), 1–16. doi: 10.3390/economies10020037.

Roger, S. (2010). Inflation Targeting Turns 20. *Finance and Development*, *47*, 46–49.

Sethi, C., & Mishra, B. R. (2024). Is Inflation Targeting Effective? Lessons from Global Financial Crisis and COVID-19 Pandemic. *International Journal of Finance & Economics*, 1, 1–22.

Svensson, L. (2002). Inflation Targeting: Should It Be Modelled as an Instrument Rule or a Targeting Rule? *European Economic Review*, *46*(4/5), 771–780. doi: 10.1016/S0014-2921(01)00212-4.

Svensson, L. (2010). Inflation Targeting. In: B. M. Friedman, & M. Woodford (Eds.), *Handbook of Monetary Economics* (Ed. 1, Vol. 3, pp. 1237–1302). Burlington: Elsevier.

Woodford, M. (2003). *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press.

Summary

This paper aims to assess the effectiveness of inflation targeting policy in emerging economies during an economic crisis, particularly the 2007 financial and economic crisis.

Thus, considering pre-crisis and crisis periods, an econometric model based on the difference-in-differences method (DID) was adopted. The sample consists of twelve inflation-targeting countries, the test group, and twelve non-targeting countries, the control group. The model was estimated using the EGLS method on panel data.

The results show that inflation-targeting emerging countries have less control over prices during crisis than emerging countries without inflation-targeting policy.

Keywords: inflation targeting, economic crises, difference in difference, panel data, emerging country

Streszczenie

Celem artykułu jest ocena skuteczności polityki celu inflacyjnego w gospodarkach wschodzących w okresie kryzysu gospodarczego, w szczególności kryzysu finansowo-gospodarczego z 2007 r.

W związku z tym, uwzględniając okresy przedkryzysowe i kryzysowe, zastosowano model ekonometryczny oparty na metodzie różnic w różnicach (DID). Próbka składa się z dwunastu krajów stosujących celowanie w inflację (grupa badawcza) oraz dwunastu krajów nie stosujących tej polityki (grupa kontrolna). Model oszacowano metodą EGLS na danych panelowych.

Wyniki pokazują, że kraje wschodzące stosujące celowanie w inflację mają mniejszą kontrolę nad cenami podczas kryzysu w porównaniu z krajami wschodzącymi, które nie stosują polityki celowania w inflację.

Słowa kluczowe: cel inflacyjny, kryzysy gospodarcze, różnica w różnicy, dane panelowe, kraj wschodzący

Note about the authors

Souhila Bouhmidi – Doctor in economic sciences, University of Oran 2 Mohamed ben Ahmed (Algeria); area of studies: monetary economics, macroeconomics.

Hamza Fekir – Professor, University of Oran 2 Mohamed ben Ahmed (Algeria); area of studies: monetary economics, macroeconomics.

Ismail Amani – Professor (Associate), University of Oran 2 Mohamed ben Ahmed (Algeria); area of studies: macroeconomics, econometrics, behavioral economics; ORCID: 0000-0002-9845-5091.