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## INFLATION TARGETING CHALLENGES IN EMERGING MARKET COUNTRIES: THE CASE OF SERBIA\*\*

**ABSTRACT:** *In the past two decades Inflation targeting has been the monetary policy framework of choice for many developed nations around the world. A significant number of emerging market countries\*\*\* have gradually subscribed to the same monetary regime, but with different levels of success. Certain differences among emerging markets in terms of overall macroeconomic environment, strength of basic monetary policy tools, and institutional development have had an effect on the performance of inflation targeting. This paper focuses on the fulfilment of basic preconditions for implementation of inflation targeting in emerging market countries, and on*

*results and challenges of inflation targeting implementation in Serbia more than six years after its introduction. Special attention is paid to high dollarization (euroization), which poses a serious challenge for inflation targeting, and to modification of the Taylor rule for dollarized economies. For inflation targeting in Serbia to be more effective, a (gradual) decrease in overall dollarization (euroization), fiscal discipline and sustainability, and an increase in the independence and capacity of the central bank are needed, among other things.*

**KEY WORDS:** *inflation targeting, emerging market countries, Serbia, monetary policy*

**JEL CLASSIFICATION:** E42, E52, E58

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\*\*\* In this paper the term “emerging market countries” will be used to include the transition and post-transition countries of Eastern Europe and the former Soviet Union.

## **1. INTRODUCTION**

Inflation targeting (IT) has officially existed globally for more than two decades. It was introduced in 1990 by the Reserve Bank of New Zealand<sup>1</sup>. Since then it has spread throughout the world in developed and emerging markets. It has prevailed as the most widespread monetary regime around the globe. Even for the most traditional central banks, which have publicly stated that they conduct a different monetary policy rule, inflation targeting often seems to have been the implicit monetary policy framework of choice (Bernanke and Mihov 1997). Before the introduction of inflation targeting most of the developed nations' central banks were conducting a monetary policy framework that very often had multiple goals, of which stable and low inflation was in most cases one of the major ones. Other goals have frequently been in conflict with the goal of a low level of inflation. But despite its fast global spread among the central banks in developed and emerging markets, a few very important central banks have never explicitly accepted inflation targeting, the US Federal Reserve (the Fed) being one of them. It has traditionally pursued a dual mandate (maximum employment and price stability) and kept on doing so even when it was one of the last major central banks with multiple goals. However, recently even the Fed has declared an inflation target level of 2% (in January 2012)<sup>2</sup>, bringing it much closer to the inflation-targeting monetary policy framework. Thus even the Fed is now commonly believed to be an implicitly inflation-targeting central bank (Thornton, 2012), despite officially still having a dual mandate<sup>3</sup>.

Proponents of inflation targeting have sometimes gone to extremes, on occasions even being referred to as “inflation nutters” (King 1997). However, some of the countries that were early proponents of strict inflation targeting have moved away from the pure IT model into an area closer to a multiple-goal hierarchical mandate. This is often referred to as flexible inflation targeting (Meyer, 2004) or “multiple-goal targeting” (Orphanides 2009), and could be considered as a close cousin of the dual mandate officially pursued by the Fed, although a hierarchical mandate in which price stability is the prime goal still defines an inflation-targeting country.

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1 Reserve Bank of New Zealand Act of 1989, Section 8, Public Act No. 157, 20. December 1989.

2 Press release on 25 January 2012: Federal Reserve issues FOMC statement of longer-run goals and policy strategy <http://www.federalreserve.gov/newsevents/press/monetary/20120125c.htm>.

3 Unemployment rate target is subject to change and at the time of setting the inflation target to 2% (January 2012) the normal rate of unemployment was set in the range of 5.2% to 6%.

So, what challenges does this monetary policy framework face in developed and emerging markets, and how has it fared in transition emerging market country like Serbia, where inflation targeting was officially introduced in 2008?

## 2. LITERATURE OVERVIEW

There have been numerous studies of inflation targeting in developed countries in the past two decades. Substantially less analysis has been done on inflation targeting in emerging markets and very few papers on inflation targeting in Serbia.

For the purpose of this research the literature described below is of particular importance. A paper by Mishkin (2000) underlined major challenges of IT implementation in emerging market countries, drawing on lessons from implementation of IT in Chile. Mishkin and Savastano (2001) debate alternative monetary policy strategies for Latin America, but also provide a thorough analysis of modification of the Taylor rule for exchange rate fluctuations, as dollarization has been singled out as a serious challenge to IT implementation in emerging markets. Jonas and Mishkin (2005) have given a detailed analysis of IT in the Czech Republic, Poland, and Hungary with particular focus on inflation targeting and EU Exchange Rate Mechanism 2 (ERM2) as a prelude to joining the eurozone. Batini and Laxton (2007) focused on the prerequisites and success of IT implementation in emerging market countries and find encouraging results in terms of lower inflation, lower inflation expectations, and lower inflation volatility. Auel and Mendonça (2011) show that credit channel works in an inflation-targeting emerging market country in the case of Brazil. Ayres, Ariel, Belasen, and Kutan (2014) for a sample of 51 developing countries (17 being explicit inflation targeters) find that inflation targeting has different regional effects concerning inflation and output growth and that inflation targeting only reduces inflation and does not stimulate economic growth. Josifidis, Beke-Pucar, Srdić, and Ivan (2014) have explored the exchange rate pass-through effect on prices and output of a selected group of developed and emerging market countries before and after the global financial crisis.

There is relatively little relevant literature on IT in Serbia. Fabris (2006) analysed (at that time still unofficial) implementation of IT in Serbia. Dragutinović (2008) clearly underlined the dominance of the exchange rate channel of monetary transmission in Serbian IT. Aleksić, Đurđević, Palić, and Tasić (2008) find that the interest rate channel of monetary policy does not work in Serbia due to high

dollarization. Kujundžić and Otašević (2012), on sample data from 2008-2011 for 33 banks in Serbia, find only weak evidence of a bank lending channel through foreign currency loans.

The contribution of this paper to the literature is that it provides an overview of inflation targeting prerequisites, functioning, and challenges, focusing on Serbia as a transitional emerging market country. This article aims to identify necessary improvements for a more efficient inflation-targeting monetary policy framework in Serbia and other similar transition emerging economies.

### **3. INFLATION TARGETING**

#### **3.1. The inflation-targeting framework**

“Inflation targeting is a framework for monetary policy characterized by the public announcement of official quantitative targets (or target ranges) for the inflation rate over one or more time horizons, and by explicit acknowledgement that low, stable inflation is monetary policy’s primary long-run goal” (Bernanke, Laubach, Mishkin and Posen 1999, p. 4).

Therefore, declaring the targeted level of inflation and using it as a nominal anchor is the essence of inflation targeting. Inflation targeting, like some other monetary policy frameworks (discretionary monetary policy, monetary targeting, price level targeting), allows for independence of the monetary policy and flexibility of the exchange rate (Šoškić 2014).

Today, most of the central banks implementing Inflation targeting do not only aim at stabilizing inflation on and around its target. As a rule, they also to a certain extent pursue the aim of stabilizing the real economy. At least unofficially, they also pursue minimizing the output gap, and tend to achieve their goals by smooth and gradual monetary policy changes so as not to create unnecessary volatility in the financial and real sectors.

To illustrate this, let us consider the so-called expectations-augmented Phillips curve in the following form (Abel and Bernanke 2001, and Phelps 1967)

$$\pi_{t+1} = E_t \pi_{t+1} - \beta(u_t - \bar{u}_t) \tag{1}$$

where

$\pi_{t+1}$ , stands for actual inflation;

$E_t\pi_{t+1}$ , stands for expected inflation;

$(u_t - \bar{u}_t)$ , stands for cyclical unemployment as the difference between the actual unemployment rate,  $u_t$ , and the natural unemployment rate,  $\bar{u}_t$ <sup>4</sup>; and

$\beta$  represents a positive number that measures the relationship between unanticipated inflation and cyclical unemployment.

It could be argued that central banks committed to inflation targeting can anchor the expected inflation,  $E_t\pi_{t+1}$  by announcing an inflation target. The credibility of this announcement is essential for the success of inflation targeting, i.e., central banks need to deliver inflation that is close to their announced target. In order to achieve this, monetary policy needs to minimize the cyclical unemployment component,  $(u_t - \bar{u}_t)$  even if stabilizing the real economy is not the primary mandate of inflation targeting.

However, most inflation-targeting proponents advocate that achieving and maintaining price stability is the best overall contribution monetary policy can make to economic welfare (Orphanides 2009). Inflation targeting should not be perceived as a policy rule but rather as a policy framework that allows for “constrained discretion” (Bernanke and Mishkin 1997). Inflation targeting is forward-looking and focuses on inflation staying on or around the numerical goal (individually defined for each country). Effective inflation targeting should anchor inflation expectations around the target to allow for additional flexibility of monetary policy (Orphanides and Williams 2005).

The functioning of inflation targeting relies on five basic elements (Mishkin and Posen 1997):

First, there needs to be a public announcement of mid-term numerical inflation targets, which serves the purpose of anchoring inflationary expectations. This should include a level or a range of annual inflation and an intermediate inflation forecast that serves as a target<sup>5</sup>. This nominal anchor is a vital component of the monetary framework and should be set in an inclusive decision-making process involving the government and other stakeholders. Realistic and attainable inflation targets are vital for building the credibility of central banks.

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<sup>4</sup> NAIRU (non-accelerating inflation rate of unemployment) could also be used.

<sup>5</sup> This is why inflation targeting is sometimes referred to as “inflation forecast targeting” (Svensson 1997).

Second, central banks' institutional devotion to price stability should be a primary goal to which all other goals are secondary. Inflation-targeting central banks may have a single legally defined mandate of price stability, or a hierarchical inflation-targeting mandate with the possibility of fulfilling other goals without jeopardizing the fulfilment of the primary goal of price stability<sup>6</sup>.

Third, when making decisions concerning monetary policy instruments, monetary policy strategy should take into account the movement in monetary aggregates, the exchange rate, and other important variables. Thus inflation targeting is more flexible, allows more discretion on the part of central banks, and does not follow a rigid rule.

Fourth, transparency of monetary policy and the central bank's communication with financial markets and the general public about plans, goals, and decisions is a must. The two vital elements concerning communication are definition of the inflation target and periodical evaluations of the inflation outlook elaborating how the target is to be achieved (inflation report). More communication does not necessarily mean better communication (for example, concerning output gap projections) and can sometimes even be counterproductive (Dale, Orphanides, and Osterholm 2008).

Fifth, there needs to be an increase in central bank credibility concerning the fulfilment of inflation goals and a mechanism for central bank accountability needs to be put in place. This relies on the institutional independence of the central bank and its capacity to deliver the targeted levels of inflation. Missing the target needs to have transparent consequences, such as public explanations, and potentially direct personal responsibility of central bank officials (Abel and Bernanke 2001), as has explicitly been the case in some inflation-targeting central banks.

### **3.2. Pros and Cons of IT**

Inflation targeting has some clear advantages.

Relative to the exchange-rate peg, inflation targeting allows monetary policy to have a certain level of discretion and to focus on domestic issues and respond to shocks to the domestic economy.

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<sup>6</sup> The ECB can be seen as a central bank with modified inflation targeting that retains the role of monetary aggregates (money) targeting (as a consequence of trying to preserve the tradition of the Bundesbank). The Fed, on the other hand, as we have seen, can be treated as an implicit Inflation-targeting central bank, despite its official dual mandate.

Relative to money-growth (monetary aggregates) targeting, inflation targeting has the clear advantage of overcoming the problem of money demand volatility, i.e., the velocity of money instability. In other words, a stable relationship between inflation and money is not critical to IT success. If demand for money changes, under inflation targeting there is nothing to prevent the central bank from adjusting the money supply to compensate for that change.

Another advantage of inflation targeting is that it is easily understood by the public. Most people understand that the central bank is trying to achieve a certain rate of inflation. That is much easier to explain than (under monetary-aggregates targeting) that the central bank is trying to achieve a certain growth rate of, for example, a monetary aggregate of M3. If the central bank is good at communicating its goals to the public and the markets it may increase its credibility and accountability.

Finally, inflation targeting calls for transparency of monetary policy - of its goals (inflation targets), projections, and results (inflation report). Thus inflation targeting allows for easier accountability of central banks to the public.

However, inflation targeting is not ideal. The initial criticisms that inflation targeting is too rigid, has the potential to produce too much output volatility, allows for too much discretion, and lowers growth are not valid objections if the framework is properly conducted (Bernanke et al. 1999). But there are some potentially serious disadvantages of inflation targeting, especially for emerging markets.

When the central bank targets monetary aggregates or the exchange rate it can directly influence these variables. A major disadvantage of inflation targeting is that when targeting inflation the central bank influence is indirect and with a significant time lag, i.e., with monetary policy transmission lags. These lags can vary significantly from one country to another (Ehrmann 2000 and Goodhart 2001). So the conduct of the inflation-targeting regime is more complex and therefore may pose a risk to the credibility of the central bank, especially in emerging markets and transition economies. As a result, the central bank cannot easily judge which policy actions are needed to achieve the inflation target and the public cannot instantly determine whether the central bank is living up to its promises with its current policy actions. Thus inflation-targeting central banks may badly miss their targets and lose credibility as a result. At the same time,

the fact that current policies have a delayed effect<sup>7</sup> on inflation can produce weak central bank accountability.

Another disadvantage is that inflation targeting alone cannot override the dominance of fiscal policy over macroeconomic variables, but this is not a shortcoming of only this monetary regime.

In addition, the flexibility of exchange rate movements associated with inflation targeting can cause financial stability risks and decrease the stability of the country's business environment. This is especially the case in the partially dollarized (euroized) financial systems of emerging and transition countries.

Finally, recent deflationary pressures after the global financial crisis of 2007/2008 have proven that inflation targeting may not be an adequate framework for dealing with disinflationary and deflationary expectations, and that price level targeting may potentially be a more adequate approach (Ambler 2009) in the new post-crisis environment.

### **3.3. Prerequisites for IT**

The implementation of inflation targeting has proved to be relatively successful in developed economies (Bernanke et al. 1999) and emerging market and transition countries (Jonas and Mishkin 2005, Batini and Laxton 2007). However, implementation of an inflation-targeting framework calls for certain preconditions to be fulfilled in emerging and transition countries to improve their chances of success.

Batini and Laxton (2007) advocate four broad preconditions for IT success in emerging and transition countries.

First and foremost, the central bank must have full institutional independence. This does not just mean that it must have full legal autonomy it has to be free from the fiscal and political pressures that conflict with the goal of achieving an inflation target. In practical terms, the policymaking board of the central bank must be insulated from politicians, without government members, and with members of the board protected from arbitrary dismissal and appointed to long terms. The central bank should have full and exclusive control of decisions concerning monetary policy instruments. This precondition also includes a strong

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<sup>7</sup> In some countries this may be years ahead.

fiscal position. Lack of fiscal discipline is incompatible with inflation targeting. High budget deficits lead to public debt crises or pressures for monetization of public debt, with pressure on the exchange rate and an increase in inflationary expectations. Therefore, an absence of fiscal dominance over the macroeconomic environment and institutional development to ensure fiscal discipline are essential for inflation targeting to have a chance of success (Mishkin and Savastano 2001).

Second, the central bank must have a strong research capacity, i.e., a well-developed technical infrastructure. The central bank must have inflation forecasting and modelling capacities and the continuously updated and available data needed to implement them. The transmission mechanism between monetary policy instruments and inflation must be fully understood.

Third, the country needs to have a solid economic structure. This means that prices must be fully deregulated, and the economy should not be overly sensitive to commodity prices (food, energy etc.). The economy should also not be overly sensitive to exchange rates. Specifically important for emerging market countries, dollarization should be minimal. This means that the local currency must be predominantly in use. The local currency interest rate is a basic inflation-targeting policy instrument. This interest rate should influence savings, consumption, and investments. If an emerging economy uses other currencies (dollars, euros) in a significant portion of financial transactions the reference rate of the central bank loses much of its influence over financial transactions, and therefore loses much of its impact on aggregate demand and inflation.

Fourth, the country should have a healthy financial system. In essence, this means that the banking system needs to be sound and capital markets relatively well developed. Monetary policy aiming at an inflation target should not be in potential conflict with financial stability goals. In addition, a healthy banking system and well developed capital markets are very important for effective monetary policy transmission.

In addition to these four broad preconditions, it should be noted that introduction of inflation targeting yields much better results after successful inflation reduction to relatively low levels. In other words, inflation targeting has a much better chance of being successful if implemented on relatively stable single digit inflation levels with several years of track record [Bernanke et al. 1999].

The absence of these prerequisites may lead inflation targeting to fail, resulting in long-run erosion of central bank credibility.

#### 4. PREREQUISITES FOR IT IN SERBIA

Now we will analyse the fulfilment of the prerequisites for IT implementation given by Batini and Laxton (2007) when IT was introduced in Serbia at the beginning of 2009, and at the beginning of 2015.

**Table 1.** Fulfilment of IT prerequisites in Serbia in 2009 and 2015<sup>8</sup>

Prerequisites/Parameters	2009	2015	Change
<b>Institutional independence</b>			
Absence of fiscal obligation by CB	High	High	Unchanged
Operational independence	Medium	Low	Negative
Inflation-focused mandate	High	Medium	Negative
Favourable fiscal balance	Medium	Low	Negative
Low public debt	Medium	Low	Negative
Central bank independence	Medium	Low	Negative
<b>Central bank Infrastructure</b>			
Data availability	Medium	Medium	Unchanged
Systematic forecasting process	Medium	Medium	Unchanged
Models capable of cond. forecasts	Medium	Medium	Unchanged
<b>Economic Structure</b>			
Low exchange rate pass-through.	High	Medium	Positive
Low sensitivity of inf. to comm. prices	High	High	Unchanged
Extent of trade openness	Medium	Medium	Unchanged
Extent of dollarization <sup>9</sup>	High	High	Unchanged
<b>Health of the Financial System</b>			
Regulatory capital (CAR)	High	High	Unchanged
Stock market capitalization.	Low	Low	Unchanged
Depth of private bond market	Low	Low	Unchanged
Stock market turnover	Medium	Low	Negative
Lack of currency mismatch in banks	Medium	Medium	Unchanged
Maturity of bonds	Low	Medium	Positive

This approach is chosen to show not just whether the prerequisites were there at the introduction of IT in beginning of 2009 but also to evaluate whether there was the necessary commitment of the authorities and their ability to plan and

<sup>8</sup> Author's estimates based on publicly available official data, assessment of status and changes in legal framework and observable policy conduct.

<sup>9</sup> In the case of Serbia, it is euroization.

drive necessary institutional change after introduction of inflation targeting. As in Batini and Laxton (2007), only three reference values are going to be given to parameters: low, medium, and high<sup>10</sup>.

As we can see in Table 1, prerequisites for inflation targeting were to a large extent unfulfilled at the beginning of 2009 when it was introduced. However, as Batini and Laxton (2007) conclude in their paper, IT in emerging markets stands a chance even without full compliance with the above set of prerequisites at the introduction of the new monetary framework. For the eventual success of IT in emerging markets it is vital to at least broadly fulfil the most important prerequisites (institutional independence, CB capacity, stable banking system) at the inception of the new monetary regime and for the authorities to exhibit the determination to plan and deliver positive institutional changes. However, as we have seen in Table 1, in Serbia that was not the case. Instead of having a less-than-ideal start but with gradual and committed improvements, we observe stagnancy and even deterioration in the conduct of some very important conditions for successful inflation targeting (dollarization, institutional independence, the capacity of the central bank, etc.)

Fiscal discipline is of utmost importance for the success of inflation targeting. However, in the last several years we have observed a constant increase in budget deficits and public debt-to-GDP ratios in Serbia.

Institutional independence has also deteriorated since mid-2012 and the enactment of the new Law on the National Bank of Serbia, the premature dismissal of previous central bank governing structures, and the subsequent political appointments.

Dollarization has been extremely high, and has not decreased, despite the efforts of the central bank in 2010 and 2011 and the signing of a “Memorandum on Dinarization” between the central bank and the government in April 2012. This memorandum has been largely ignored ever since, not just by the government but by the central bank as well. With high dollarization, the interest rate channel as the main transmission channel of Inflation targeting does not work (Aleksić at al.2008). High dollarization in Serbia is persistent (Rajković and Urošević 2014) and adversely affects banking sector credit risk and non-performing loans (NPLs) (Božović, Urošević, and Živković 2009).

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<sup>10</sup> But instead of 1, 0.5, and 0, we will use high, medium, and low.

The influence of commodity (food) prices on inflation was and still is high, with a processed and unprocessed food weight of around 38% in the consumer price index (CPI) for most of the past six years<sup>11</sup>. There has been no real effort to minimize the volatility of these prices and diminish the negative impact they may have on the level and volatility of inflation and inflationary expectations.

Obviously, there was a lack of adequate preconditions for implementation of inflation targeting at end of 2008/beginning of 2009 (mentioned in Table 1). But in addition, some other conditions were also not supporting the IT effort.

At the beginning of 2009, it was obvious that there was a lack of understanding and lack of consensus about inflation-targeting implementation among the government, the real sector, the financial sector, and the general public. There was insufficient understanding of why it was being implemented, what everyone needs to do in order for IT to work, and what are realistic expectations from the central bank under the new monetary regime. Flexibility of exchange rate within the framework of inflation targeting was and still is an unacceptable feature for most stakeholders. Strong lobbying groups in the corporate and financial sectors and the government prefer a fixed exchange rate. Without full understanding of the central bank's mandate under inflation targeting it is all but impossible to increase the credibility of the central bank.

Inflation targeting was officially introduced at the beginning of 2009, following several years of appreciation of the real and even the nominal exchange rate, mainly due to high capital inflows at that time. Setting a relatively low inflation target in these circumstances hampered the necessity of eventual depreciation of the real exchange rate, since a relatively high pass-through would increase inflation and inflationary expectations and eventually drive inflation substantially out of the targeted inflation corridor.

Inflation targeting was introduced after several years (2005 to 2008) of credit growth based on dollarization (euroization). Dollarization has diminished the possibility of depreciation of the real exchange rate without deteriorating financial stability (through a rise in NPLs). It has also significantly decreased the effectiveness of the basic inflation-targeting monetary policy tool, the central bank's reference rate.

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<sup>11</sup> After the last CPI revision at the beginning of 2013, food prices have a somewhat smaller weight in CPI, but still very significant – 34,5%.

Inflation targeting was introduced at the beginning of 2009 when there was still a considerable portion of so-called government-regulated prices (again, contrary to preconditions described by Batini and Laxton (2007)). These regulated prices (according to the arrangement between the government and the central bank) were to have a higher rate of growth compared to the CPI under inflation targeting. Thus the cost of the inefficiency of public corporations that have regulated prices was being shifted to consumers, while monetary policy needed to be more restrictive to achieve an inflation target, hitting more the tradable sectors of the economy, precisely the ones necessary to provide healthy rates of economic growth.

Inflation targeting was introduced in a very transparent framework of daily publicly available information on potential interventions in the FX market by the central bank. This transparency, however, was to a certain extent misused by the media. Public debate focused on the amount of FX intervention by the central bank and the fact that it did not stop the depreciation trend, without explaining to the public that the mandate of the central bank under inflation targeting was precisely that: not to reverse the trend but to cut unnecessary volatility. Therefore this type of media reporting was creating negative expectations in terms of future exchange rate movements and inflation. It was again a case, this time in Serbia, of the well-known phenomenon that despite transparency being a virtue, too much transparency can sometimes hamper the stability and efficiency of financial markets (Neuenkirch 2013). However, once a central bank allows a higher level of transparency it is not easy to revert.

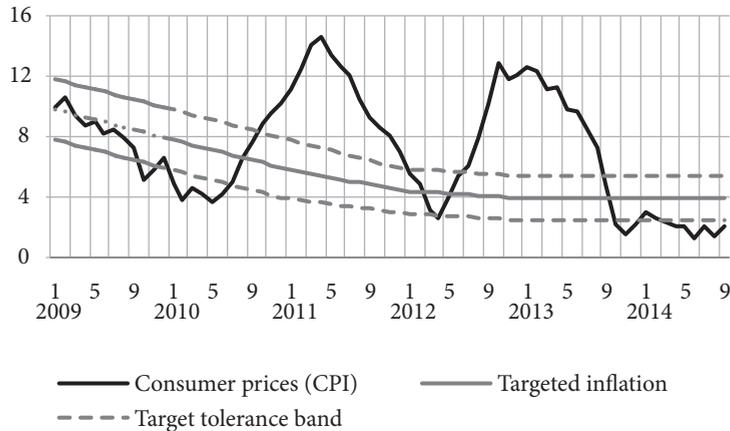
## **5. EFFECTIVENESS OF IT IN SERBIA**

So, how effective has inflation targeting been in Serbia since 2009?

### **5.1. Inflation and output**

One of the main reasons for the implementation of inflation targeting was that it was expected to be effective in bringing down inflation and stabilizing inflation within the target corridor, with the potential side effect of stabilizing output.

**Figure 1.** Inflation in Serbia (YoY rate, in %)



**Source:** National bank of Serbia

[http://www.nbs.rs/internet/cirilica/30/30\\_9/kretanje\\_inflacije.html](http://www.nbs.rs/internet/cirilica/30/30_9/kretanje_inflacije.html)

However, if we look at Figure 1 it is obvious that the inflation path since the inception of IT in Serbia exhibits substantial volatility. In the initial phase of implementation it seemed that inflation has been steadily brought down within a target corridor. However, this period was also the period of the first wave of recession in Serbia after the global financial crisis, with GDP dropping by around 3.5% in 2009. Therefore the gradual decline in inflation within the corridor of inflation targeting was most probably the outcome of decline in aggregate demand due to severely depressed output caused by the global crisis than by the effectiveness of inflation targeting.

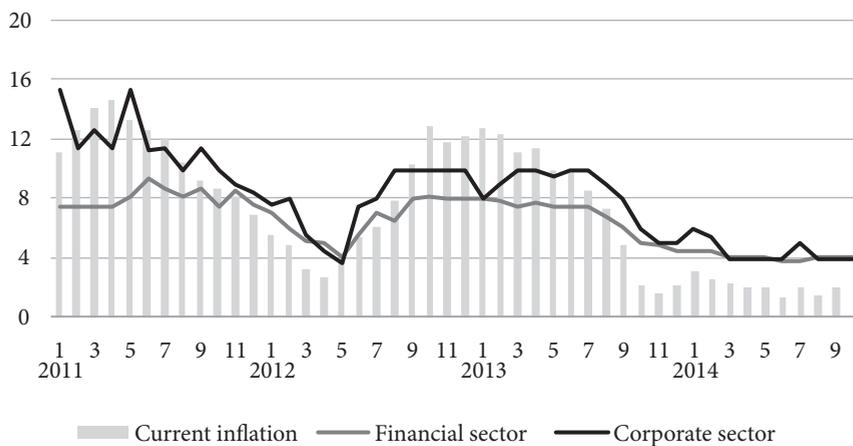
As is obvious from Figure 1, by the end of 2009 inflation very soon slipped below the lower bound of the inflation-target corridor, and has remained out-side of this corridor most of the time ever since<sup>12</sup>. Huge spikes of inflation above the upper band in 2011 and 2013 are the consequence of a supply shock in food production. Serbian CPI is oversensitive to prices of unprocessed and processed food, and volatility of these prices proves to be highest in the SEE region. This over-sensitivity of inflation to commodity prices makes it very hard to have solid inflation projections, with not much that can be done with the available monetary policy instruments. This is a well-known effect that can seriously hamper inflation targeting (see in Prerequisites for IT, Economic Structure), and obviously needs to be dealt with for IT to work.

<sup>12</sup> The only exception being the first half of 2012.

In the rest of the period inflation was mainly below the lower band of the target corridor. This has even led to comments<sup>13</sup> that such low inflation shows the success of monetary policy, which neglects the fact that undershooting an inflation target is just as bad and costly as overshooting it (Mishkin and Savastano 2002).

If we take a look at inflationary expectations (Figure 2) we can see that they have been declining in recent years, that the financial sector as a rule has lower inflationary expectations compared to the corporate sector, and that they anchored around the inflation target in 2014. However, throughout most of the period inflationary expectations closely follow the current inflation, not the inflation target. And just when current inflation falls below the lower band of the inflation target, expectations decline to the level of the inflation target. Unfortunately, this inflation-expectations behaviour can only be explained as a lack of confidence in the inflation-targeting determination of the central bank in the eyes of financial and corporate sector representatives. Lack of credibility on the part of the central bank can seriously hamper inflation-targeting prospects (see Prerequisites for IT, Institutional Independence).

**Figure 2.** Inflation expectations one-year ahead and current inflation (y-o-y rates, in %)



Source: NBS Inflation Report November 2014

In terms of growth and its volatility (Figure 3) we can observe that since the inception of IT in Serbia the country has entered a period of negative, low, and volatile economic growth. It would most probably be unsound to argue that these

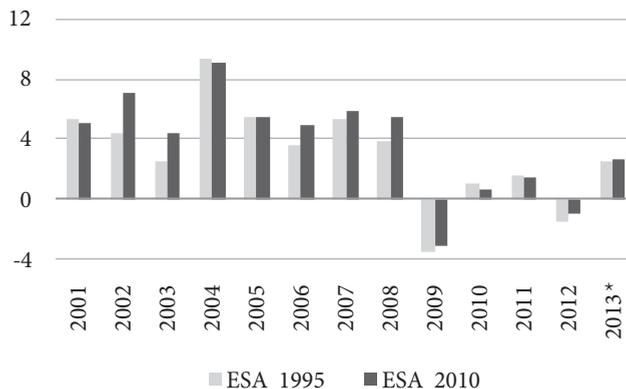
<sup>13</sup> Coming from the central bank itself.

on average lower and more volatile growth rates are due to inflation targeting, since they coincide with the first wave of the global financial crisis and seizure of capital inflows to the country. But it would certainly be fair to say that it would be hard to find evidence that inflation-targeting implementation in Serbia has supported growth and decreased output volatility. In other words, in terms of growth and output volatility, inflation targeting in Serbia may not be harmful but most probably is not beneficial either.

Based on the above data, it is obvious that since its inception in Serbia most of the time inflation targeting has missed the inflation target, has not succeeded in reducing inflation volatility, has been unsuccessful in anchoring inflationary expectations based on the credibility of the commitment and projections of the central bank, has not supported growth, and has not decreased output volatility.

We have seen the lack of fulfilment of preconditions for inflation targeting in Serbia in 2009 and 2015 and we have seen the absence of significant positive results of its implementation.

**Figure 3.** Real GDP Growth Rates (in %)



Source: NBS Inflation Report November 2014

So, what is the main obstacle for inflation targeting in Serbia?

## 5.2. Inflation targeting and dollarization

It is clear that high dollarization poses a serious challenge for inflation targeting (see Prerequisites for IT, Economic Structure).

We know that inflation targeting goes hand in hand with exchange rate flexibility. But we also know that high dollarization can seriously hamper inflation targeting (Mishkin and Savastano 2001) by making any substantial exchange rate depreciation a shock that deteriorates the balance sheets of banks, corporates, individuals, and government, and increases the risks of a financial crisis (Mishkin 1996).

Therefore, in highly dollarized countries, monetary policy needs to take into account exchange rate movement not just in terms of exchange rate pass-through to inflation but due to financial stability concerns as well.

Let us start with the basic original Taylor rule (Taylor 1993) that states that the nominal desired policy instrument of the central bank (short-term interest rate),  $i$ , has to react to deviations of inflation and output from their respective targeted levels:

$$i = \pi + 0.02 + 0.5y + 0.5(\pi - 0.02) \quad (2)$$

where

$\pi$ , stands for actual inflation in the previous year, and

$y = (Y - Y^*)/Y^*$ , stands for percentage deviation of output from full-employment output.

In this equation, 0.5 is used as a weight ( $\alpha_1$ ) i.e., monetary policy reaction coefficient for the output gap,  $y$ , but also as a weight ( $\alpha_2$ ) for the inflation gap,  $(\pi - 0.02)$ , i.e., the difference between inflation,  $\pi$ , and the inflation target,  $\pi^*$ , of 2% ( $\pi^* = 0.02$ ). Since  $\alpha_1 = \alpha_2 = 0.5$ , it implies that the short-term interest rate as a monetary policy tool should be equally sensitive to the output gap and inflation gap. If the output gap is 0 and the inflation gap is 0 the equation reads as: actual inflation,  $\pi$ , plus real short term interest of 2% (0.02). This is then an equilibrium-level interest rate,  $\bar{i}$ . Taylor has showed that historically this simple rule quite accurately describes actual Fed interest rate moves.

If we expand this basic rule in terms of expectations and forward-looking policies (Clarida et al. 1998), we introduce  $E_t$  as expectations at time  $t$  and get:

$$i_t = \bar{i} + \alpha_1 E_t(\pi_{t+k} - \pi^*) + \alpha_2 E_t(Y_{t+k} - Y^*) \quad (3)$$

The second term on the right hand side of the equation is the expected inflation gap of the  $k$ -period ahead. The third term is the expected output gap of the  $k$ -period ahead. Again,  $\alpha_1$  and  $\alpha_2$  are the reaction coefficients of the monetary policy tool of the expected gaps.

If exchange rate is important in dollarized economies because of a pass-through effect and possible financial stability impact, it has to be taken into account in a monetary policy rule.

We can assume that exchange rate is a function of interest rate and that it can be determined by:

$$e_{t+k} - e^* = \theta i_t + \varepsilon_t \quad (4)$$

where  $e_{t+k} - e^*$  is the log of the real exchange rate expressed as a deviation from medium term (normal) exchange rate level,  $\theta$ , is a function that captures a positive relationship between exchange rate and interest rate, and  $\varepsilon_t$  is an error term (Mishkin and Sevastano 2001). Now our Taylor-based rule for monetary policy in a dollarized economy takes the following form:

$$i_t = \bar{i} + \alpha_1 E_t(\pi_{t+k} - \pi^*) + \alpha_2 E_t(Y_{t+k} - Y^*) + \alpha_3 E_t(e_{t+k} - e^*) \quad (5)$$

The third term on the right hand side is the expected exchange rate gap of the  $k$ -period ahead. Again,  $\alpha_3$  is a reaction coefficient of the monetary policy tool of the expected exchange rate gap.

In conducting inflation targeting in emerging markets with highly dollarized economies it is very important to understand how large  $\alpha_3$  is. As  $\alpha_3$  approaches 1, inflation targeting approaches exchange-rate targeting. This is very much a possibility in emerging countries like Serbia if the exchange rate channel is dominant (Dragutinović 2008) and the interest rate channel does not work due to high dollarization (Aleksić, et al. 2008).

Most of the assets and most of the liabilities in Serbia are FX denominated, with the highest portion in euros or linked to the euro FX rate. 73.3% of total deposits are in FX, 85% of total corporate loans are in FX, and 64% of total household loans are in FX (NBS 2013).

So how does this very high dollarization affect inflation targeting in Serbia?

First, every time a reference rate is raised, the interest rate channel should increase the cost of borrowing, stimulate savings, and decrease demand. But when the National Bank of Serbia increases the reference rate it mainly influences the local currency cost of borrowing and local currency denominated loans. Since they are only 15% of total corporate loans and 36% of total household loans, the influence of reference rate on aggregate demand is vastly hampered. At the same time, since 89.4% of household savings are FX denominated (NBS 2013), an increase in local currency reference rate hardly stimulates additional savings. Therefore the reference rate movement has a low aggregate demand impact.

Second, since the vast majority of loans are denominated in euros or linked to the movement in the euro exchange rate, the ECB reference rate and EURIBOR have a greater impact on the cost of borrowing in Serbia than the reference rate of the National Bank of Serbia.

Third, the high level of dollarization increases the pass-through of exchange rate depreciation into inflation<sup>14</sup>. In this way, potentially, there is a decrease of manoeuvring space for monetary policy relaxation, since every decrease in the local currency interest rate decreases the interest rate differential, and can induce withdrawal from the local currency, depreciation, and, consequently, substantial pass-through inflation.

Fourth, every increase in the central bank interest rate, without any change in the financing conditions in euro-denominated loans, increases the cost of borrowing for local currency loans. As a consequence it stimulates additional euro-denominated borrowing. This in turn increases dollarization (euroization) of the system, and a vicious circle begins. An increase in dollarization colludes with the interests of financial stability<sup>15</sup>, and additionally decreases the effectiveness of the central bank reference rate.

Fifth, a rising NBS reference rate, without a change in euro interest rates, increases the interest rate differential between the local currency and the euro, and stimulates inflow of short-term speculative capital – the carry trade. This

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<sup>14</sup> Since a lot of payments in the country are made in euros or indexed to the euro exchange rate (real estate, rents, some salaries, materials, etc.).

<sup>15</sup> As a solution to this problem, the NBS (between 2010 and 2012) put an order in the policy instrument of reserve requirements, and used the change in reserve requirements for FX sources of funding as a tool to simultaneously increase the cost of borrowing for FX-denominated loans in line with the increase in the local currency reference rate. That has increased the effectiveness of NBS monetary policy.

capital inflow can support fundamentally unjustified appreciation of local currency, but when exiting can provoke fundamentally unjustified depreciation of local currency, thus increasing the instability of the local financial system. It could be argued that the reference rate can easily be transformed from a mid-term instrument influencing aggregate demand into a short-term instrument managing the carry trade and exchange rate.

In such circumstances, inflation targeting would have actually been abandoned in favour of exchange rate targeting. Effectively, there would be a change in the nominal anchor from targeted inflation to targeted exchange rate. In the parlance of the above-mentioned equation (5),  $\alpha_3$  would tend to 1.

Sixth, in the case of negative expectations of exchange rate depreciation, high dollarization can provoke a relatively sudden and overemphasized shift among transactors from local currency to foreign currency, which is perceived as a flight to safety. This can contribute to and overstate depreciation and, through pass-through, unnecessarily increase inflation. Higher prices, once achieved through pass-through, tend not to come down in the same proportion after the subsequent appreciation.

Briefly, without a gradual and continual decrease in dollarization, inflation targeting in highly dollarized countries lacks a realistic chance of success.

## **6. DISCUSSION AND CONCLUSIONS**

Serbia has gathered substantial Inflation targeting experience in the environment of a financially underdeveloped but highly dollarized economic system. Inflation-targeting results after six years of implementation in Serbia are below par among emerging markets, and with discouraging trends. They are far below the expectations from this monetary policy framework at its inception.

If inflation targeting remains the monetary framework of choice for Serbia, it is vital to create conditions for its success. This calls for substantial and persistent improvements in several areas.

**Decrease dollarization (euroization).** Initiate and persistently implement the Memorandum on Dinarization signed between the government and the central bank in 2012. It is vital to create a consensus on this important issue and generate support in the government, financial institutions, the real sector, and the general

public. The rule is simple: if the country wants to have and use its monetary policy, it needs to use its money more.

**Increase institutional independence and central bank capacity.** The central bank needs to (re)gain its independence from political influence. It also needs to significantly increase its know-how, forecasting capacities, and the effectiveness of its infrastructure and policy tools. Fiscal discipline needs to be established and sustainable in the long run.

**Decrease the sensitivity of inflation to commodity (food) prices.** It is vital to decrease the volatility of food prices in Serbia (at least to the regional average). At the same time it is important to explore and use methodological opportunities to decrease the sensitivity of the CPI to sudden and short-term price movements of unprocessed and processed food. The aim is to decrease potential methodologically avoidable and unnecessary volatility in this measure of inflation.

**Decrease non-performing loans.** This should be carried out in an organized way by the majority of banks in order to strengthen their balance sheets and make them more resistant to the flexible exchange rate associated with inflation targeting.

**Optimize the transparency level** of central bank FX operations. This is important to avoid creating unnecessary negative market expectations due to misinterpretation of information.

If Serbia and similar emerging market countries are not prepared to support and implement such measures, inflation targeting will not succeed. If nothing is done to create conditions for successful implementation of inflation targeting and none of the alternatives to IT are implemented, the system may gradually slide towards an undefined discretionary monetary regime with perceived multiple implicit goals. This may be inefficient not just in terms of inflation control and stable sustainable growth but also in terms of resistance to financial crisis.

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