Theoretical and Practical Foundations of Inflation Targeting with Special Emphasis on the Experience of Serbia

Milena Lazić1* | Ivana Domazet2

1 Belgrade Banking Academy - Faculty of Banking, Insurance and Finance, University Union, Belgrade, Serbia
2 Institute of Economic Sciences, Belgrade, Serbia

ABSTRACT
Compared to the 1970s when the inflation rate in most countries reached double digits, nowadays we are facing low inflation rates globally. Inflation targeting, as a monetary policy strategy, appeared in late 1980s in the period when other strategies proved to be insufficiently effective. The first country to apply inflation targeting in 1989 was New Zealand. Since then, 64 countries have implemented the inflation targeting as a monetary policy regime. The concept of inflation targeting as a strategy for conducting monetary policy in Serbia was introduced in August 2006. When choosing the appropriate strategy to ensure price stability, the NBS relies on the experiences of other countries, especially Central and Eastern European countries. Accordingly, the paper aims to present the genesis of the development of the inflation targeting, as well as the impact of applying this strategy on reducing global inflation. A special segment of this paper is devoted to the analysis of the experiences of Serbia in terms of applying the inflation targeting.

Key words: inflation targeting, small open economy, transmission mechanism of monetary policy, pass-through effect, dollarized economy, Serbia

JEL Classification: E4, E5, E6, N1

INTRODUCTION
Contemporary central banking faces numerous challenges. In this regard, the authors Kozaric and Fabris (Kozaric & Fabris, 2012) stated in their paper that the key problems that central banks are facing today are the followings:

- Choosing monetary policy goal;
- Choosing monetary policy regime and
- Selecting the key monetary policy instruments.

As far as the goals are concerned, Friedman (Friedman, 1968) states that there is a consensus among the general public regarding the basic objectives of economic policy in terms of high employment, low inflation (price stability) and economic growth. The author, however, considers that there is no such consensus to their mutual consent. However, the findings of numerous empirical studies have confirmed the existence of a positive link between price stability (stable economic environment) and economic growth. It is therefore not surprising that the large number of modern central banks as the main goal (or one of the basic goals) of
monetary policy management emphasize the establishment and maintenance of price stability, i.e. the preservation of the purchasing power of the national currency.

In addition, most contemporary central banks implement their monetary policy within the framework of some of the current regimes. Generally, monetary policy regimes provide a framework for the decision-making process implemented by monetary authorities in the country (in the form of a set of more or less rigid rules and procedures). In this regard, the authors Bordo and Schwartz (1997) in their paper made a distinction between monetary regimes and monetary standards. According to these authors the monetary policy regimes imply "... A set of monetary arrangements and institutions accompanied by a set of expectations - expectations by the public with respect to policymakers’ actions and expectations by policymakers about the public’s reaction to their actions.... ". Contrary to that, and according to these authors, monetary standards refer only to institutions and arrangements which are in the function of managing money supply.

Historically, over time, two basic categories of monetary policy regimes have been singled out. The first category includes regimes that have implied convertible of currency into goods (usually gold). The second category includes contemporary regimes that function within the framework of the so-called fiat money. These are as follows:

- Exchange rate targeting;
- Monetary aggregates targeting (monetary targeting);
- Monetary policy regime with an implicit nominal anchor and
- Inflation targeting.

As with homogeneity of the perception of the basic goals of monetary policy, there is a certain consensus regarding the trend of the application of different monetary policy regimes. Eugenio Domingo Solans, the Member of the Executive Board of the European Central Bank, believes that in recent years the tendency towards the "standardization of the monetary policy regimes" has become more prominent at the global level. Namely, in the last few decades, there has been a shift in the way monetary policy is conducted. In other words, many countries have abandoned various forms of fixed exchange rate regimes that they applied until then, adopted a free (or managed) floating of their currencies, or implemented a strategy of inflation targeting. With that regard, one of the key findings presented in the work of the author Pesakovic (2017) was the importance of historical perspective when conducting a policy which was often ignored in past.

The first country which applied inflation targeting in 1989 was New Zealand. Since then, 64 countries have implemented the inflation targeting as a monetary policy regime. The concept of inflation targeting as a monetary policy regime in Serbia was introduced in August 2006. When choosing the appropriate regime/strategy to ensure price stability, the NBS relies on the experiences of other countries, especially Central and Eastern European countries.

With that regard, the subject of this paper is the analysis of our country's experience regarding the implementation of inflation targeting regime. The paper aims to illustrate the basic effects of inflation targeting implementation in the case of Serbia as a small open emerging market economy with recent hyperinflation past.

The paper consists of four parts. After the introductory remarks, the second part provides an overview of the literature which deals with the inflation targeting strategy and points to the main advantages and disadvantages of this monetary policy regime. In the third part the experience of Serbia regarding the application of inflation targeting strategy was analyzed. Within the fourth, i.e. final part, concluding observations and recommendations for further research in this area have been provided.

2 Including the European Union, USA and South African countries, see more on: http://www.centralbanknews.info/p/inflation-targets.html
LITERATURE REVIEW

Compared to the 1970s when the inflation rate in most countries reached double digits, today we are facing low inflation rates globally (with the exception of underdeveloped countries in South America, Africa and Asia). Inflation targeting, as a monetary policy strategy, appeared in late 1980s in the period when other strategies proved to be insufficiently effective. Bernanke, Laubach, Mishkin and Posen (Bernanke et al., 2001) in their paper defined inflation targeting as the monetary policy framework whose main characteristics are public announcement of numeric target (or fluctuation zone) for the selected inflation rate for one or more time periods, as well as a clear determination of monetary authorities that stable and predictive inflation rate is the main goal of the monetary policy. Inflation target is mostly connected with the consumer price index, i.e. some variances of this index which occur by exclusion of some price categories (food price, energy, mortgage loans interest rates, etc.).

Heenan, Peter and Roger (Heenan, Peter & Roger, 2006) selected the four pillars which they consider to be the basis of inflation targeting:

• Explicit determination of the central bank to proclaim price stability the main goal of the monetary policy, as well as a high degree of central bank independence in its everyday operational procedures;
• Defining explicit numeric target for the selected rate of inflation;
• Responsibility of central bank for implementation of the proclaimed goal which is reflected through a high level of transparency in conducting monetary policy;
• Implementing policy based on pro-active approach, i.e. anticipation of factors which can contribute to the growth of inflationary pressures and accordingly undertaking appropriate measures.

Complementary to the above mentioned, in his paper Svensson (2010) emphasized the following basic characteristics of the inflation targeting:

• the public announcement of the numerical target or the fluctuation zone of the targeted inflation rate measured mainly by the consumer price index (it is also important to note that the inflation rate is previously defined for the midterm goal);
• high level of transparency and responsibility of monetary authorities which is accomplished through continuous communication with the public regarding plans and goals along with making public reports on inflation and its determinants;
• goals regarding stabilization of economic activity are not ignored, although these goals are considered in the long run;
• a certain (justified) deviation from a defined target is tolerated in order to prevent sudden shocks in the short run.

Inflation targeting should be considered primarily as a framework for conducting monetary policy, rather than as a set of rigid rules that the monetary authorities in the country must adhere to (Hammond, 2012). Implementation of the inflation targeting implies that the central bank sets an explicit target in terms of the level of inflation rate, which necessarily affects the increase in the level of transparency, i.e. the establishment of the credibility of the monetary policy process. Generally, central banks usually opt for a "more flexible" form of inflation targeting strategy, that is, instead of explicit numerical value for the target rate they determine the fluctuation zone and the probability of realization of each scenario. In this way, the emphasis is placed on the medium-term (most often two to three years) the fulfillment of the set goal, i.e. justifiable deviations are allowed in the short run.

According to some authors (Gürkaynak et al., 2006), this allows monetary authorities to manage inflationary expectations more easily, while at the same time it represents an efficient method for controlling the level of inflation in the long run. In fact inflation targeting is a
strategy based on two contradictory elements: defining a precise numerical value for the targeted inflation rate in the medium term and responding to sudden and unforeseen shocks in the short run (King, 2005).

The inflation targeting defines a framework for conducting monetary policy which is based on the rule which speaks in favor of the potential rigidity of the regime itself. The regime basically consists of defining the operational target for the nominal short-term interest rate of the central bank that functions in the inflation targeting framework.

In his book, Woodford (2003) states that decision made by monetary authorities almost always involves determination of the level of the short-term interest rate that is in the function of an operational target, as well as increased transparency in decision-making and reaching the ultimate goal. In this context, it is not surprising that dedication to achieving the ultimate goal implies the definition of a specific procedure when deciding on the amount of the short-term interest rate.

However, what gives some flexibility to the regime is the fact that the central bank never actually fixes the interest rate completely. In addition, within the defined framework, the central bank has discretion to respond to sudden shocks.

Regarding the aforementioned stipulations, in practice there are two basic ways in which the central banks achieve defined operational target in terms of the numerical value of the selected nominal short-term interest rate. The first way involves conducting open market operations in the form of regulating the amount of money in circulation. The other way represents the corridor system and is applied, among other things, in our country. The corridor system involves determining the amount of the selected key interest rate and the basic money market interest rates - deposit facilities interest rate and lending facilities interest rate. The interest rate corridor system has proven to be highly efficient in countries such as Canada, Australia and New Zealand.

The most famous practical example of the rule for determining the level of the short-term nominal interest rate was defined by John Taylor in 1993 (Taylor Rule). In its basic form, Taylor rule was defined by the following equation:

\[ i_t = 2 + \pi_t + 0.5 (\pi_t - 2) + 0.5 (y_t - y_{tp}) \]

where \( \pi_t \) stands for the current inflation rate and \( y_t \) and \( y_{tp} \) represent gross domestic product and potential gross domestic product, respectively. Taylor's rule is defined according to the available empirical data for the American economy. As the optimal inflation rate, the rate of 2% has been selected.

Compared to other strategies, the inflation targeting strategy provides the wider public with the clearest explicit goal, places more emphasis on the transparency of central bank operations and the growth of their credibility (Obradović, Dinić, & Pivašević, 2014). In addition, some authors (Arestis & Sawyer, 2008) believe that the application of the inflation targeting as a monetary policy regime reduces the importance of fiscal policy, due to the reduction of the possibility of deficit budget financing from the primary emission.

Svensson (2002) stated that the strategy of inflation targeting proved more efficient in the domain of reducing the growth rate of the general level of prices compared to the strategy of monetary aggregates targeting. Apart from that, in addition to reducing the inflation rate, it has been proved empirically that the huge number of countries managed to increase credibility and transparency in conducting monetary policy by applying the inflation targeting as a monetary policy strategy (Obradović, Dinić, & Pivašević, 2014).

The first country which applied inflation targeting in 1989 was New Zealand. Inflation targeting was most often applied in situations where another monetary policy regime gave a bad results. Thus, a large number of European countries accepted the concept of inflation targeting
after a sudden collapse of the ERM system in 1992 (Fabris & Galić, 2016). Today, almost all central banks in the world are legally required to declare price stability as one of their primary goals (Laurens et al., 2015).

The panel of countries that implement inflation targeting is very heterogeneous. Analyzing Figure 1, it can be noted that the average level of inflation in developing countries has drastically decreased as the number of developing countries which started to apply this strategy increased (from the initial 60% in 1995 to less than 10% in 2014). When it comes to developed countries, the growth in the number of developed countries that implemented inflation targeting has also contributed to lowering the average inflation rate of developed economies, though to a far lesser extent.

![Figure 1](image.png)

**Figure 1.** The level of the world inflation (for developed countries and developing countries) and the beginning of implementation of the inflation targeting strategy

*Source: (Hale & Philippov, 2015, p.2)*

The IMF study supports the aforementioned (International Monetary Fund, 2005), showing that in the period 1990-2004 in the countries that implemented the inflation targeting, the inflation rate was 4.8 pp lower on average in comparison with the inflation rate of countries that applied some of the alternative monetary policy strategies. In addition, the implementation of the inflation targeting also contributed to lowering the inflation rate variability (declining variability by 3.6 pp versus countries that used alternative monetary policy strategies).

Advantages and disadvantages of the inflation targeting strategy are shown in Table 1.

**Table 1.** Advantages and disadvantages of implementation of inflation targeting strategy

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
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<tr>
<td>Central bank focused on domestic shocks</td>
<td>Rigid regime with too much discretion</td>
</tr>
<tr>
<td>It is not necessary to have stable and predictable link between inflation and monetary aggregates.</td>
<td>Controlled prices make implementation of the regime more difficult</td>
</tr>
<tr>
<td>The strategy is comprehensible to general public</td>
<td>Underdeveloped financial markets make implementation of the regime more difficult</td>
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Although it has many advantages, the inflation targeting regime has some drawbacks as well. In the last few years, the question of the applicability of this regime in the presence of informal dollarization has been increasingly raised in the professional public. Informal dollarization implies a situation where the economy and the population choose to use a foreign currency as a value keeper (which implies the high share of deposits denominated in foreign currency in total deposits).

This resulted in a significant weakening of the key policy instrument (domestic short-term interest rates) to the achievement of the final target (targeted inflation rate / fluctuation zone). In their paper, Fabris and Galic (2016) state that countries with two currency systems which are characterized by a high level of fluctuations in the exchange rate cannot apply the conventional inflation targeting regime. Namely, the high level of fluctuations in the exchange rate in the conditions of high dollarization significantly determines the level of prices in the country. Regarding that, there is a consensus in the literature that the pass-through effect is higher in highly dollarized countries compared to those in which dollarization is not present (Reinhart, Rogoff, & Savastano, 2014).

**EXPERIENCE OF SERBIA IN IMPLEMENTING INFLATION TARGETING**

Over the past two decades Serbian economy has been characterized by price volatility and high inflation rates, inadequate monetary policy and a very weak and underdeveloped financial system (Vilaret, Pješčić, & Đukić, 2009). In order to increase the credibility of the central bank, for the last two decades domestic monetary authorities have been trying to build an environment with low and stable inflation rates. With that regard, numerous empirical studies have found that a low, stable and predictable inflation rate is positively correlated with the economic growth. Currently and according to scores assigned by the two most prominent rating agencies, Serbia has stable outlook, but there is a possibility for change in economic environment and a high credit risk, mostly due to slow economic grow and high share of public and foreign debt in GDP (Brkić and Pijalović).

The problem of price instability, which culminated in hyperinflation in the first half of the 1990s, with the existence of high degree of pass-through of the exchange rate on prices, was the main reason why foreign exchange rate was used as a nominal anchor for a long time in the suppression of inflationary pressures (Tasić, 2008). Consequently, the inflation rate was reduced from 111.9% in 2000 to 15% in 2002.

After the official exchange rate became equal to the market rate, the National Bank of Serbia abandoned the fixed exchange rate regime and introduced the managed floating as the exchange rate regime. All that resulted in decline of inflationary expectations in the forthcoming period.

The concept of inflation targeting as a monetary policy regime in Serbia was introduced in August 2006, although formal implementation of the regime did not start before January 2009.
When choosing appropriate strategy to ensure price stability, the NBS relies on the experiences of other countries, especially Central and Eastern European countries.

As a measure of inflation, the annual percentage change in the consumer price index is taken, which at the same time represents the most reliable numerical indicator of the direction of monetary policy conduct in the country. However, the inflation projection cannot be made without assuming direction of monetary policy conducting during the period covered by planning. The assumption of direction of monetary policy conducting is a critical aspect of the inflation projection because it can be interpreted as a statement of the intention of the central bank in the medium term (Đurđević, 2007).

The basic instrument that the NBS uses to achieve its goal is the key policy rate. Other monetary policy measures are an auxiliary instruments whose main goal is to make the monetary transmission process more efficient. Inflation projections are based on the assumptions about the movement of the interest rate on which they are based. With that regard, the literature provides three basic models for the projection of the inflation rate in the following period (Đurđević, 2007):

- constant key policy rate;
- the key policy rate based on market expectations;
- the key policy rate which central bank intends to follow.

Table 2 shows the monetary policy regime conducted by the National Bank of Serbia since the year 2000. Apart from that, the main characteristics of these regimes are explained.

Table 2. Monetary policy regimes implemented by the NBS in the period 2000 - 2015

<table>
<thead>
<tr>
<th>Monetary policy regime</th>
<th>Operation target</th>
<th>Exchange rate regime</th>
<th>Monetary policy instruments</th>
<th>Control of capital</th>
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<tr>
<td>Monetary targeting (2000-2006)</td>
<td>Net domestic assets (top); Net foreign assets (bottom)</td>
<td>Managed fluctuation</td>
<td>Interventions on the foreign exchange market; the rate of mandatory reserve; open market operations</td>
<td>Yes (short term)</td>
</tr>
<tr>
<td>Inflation targeting (September 2006)</td>
<td>Short-term interest rates</td>
<td>Managed fluctuation with a tendency towards free fluctuation</td>
<td>Two-week (one week) repo rate as the main instruments; auxiliary instruments: interventions on foreign exchange market; prudential measures; mandatory reserve rate</td>
<td>Yes (short term)</td>
</tr>
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Source: (Vilaret, Pješčić & Dukić, 2009), p. 60

In the new monetary policy framework, the target for inflation is determined as a unique value with the allowed deviation for several years in advance.

For the period from January 2018 to December 2019, the Memorandum on targeted inflation rates of the National Bank of Serbia foresees a targeted rate of total inflation of 3% with a tolerance of +/- 1.5 p.p (see Figure 2).
Taking into account that Serbia is highly euro-oriented economy, in the conditions of applying the inflation targeting, the fact that the monetary policy in our country is far less effective and precise in comparison with other countries in which foreign currency is not dominant should be taken into consideration.

The change in the key policy rate by the central bank should theoretically influence the cost of the loan and, consequently, the aggregate demand in such a way that any increase in that rate also increases the cost of borrowing, reduces the aggregate demand and lowers the inflation rate. In addition, the growth of interest rates simultaneously discourages consumption (aggregate demand), i.e. has a stimulating effect on the economy and savings.

However, in highly dollarized economies operating in the inflation targeting regime, the change in the key policy rate only affects the cost of loans and deposits denominated in domestic currency, which implies higher volatility and far more significant changes in this instrument in absolute terms in order to achieve the desired effect.

In support of the above mentioned, the results of the research conducted by Rajkovic and Urosevic (Rajkovic & Urosevic, 2016) point out that when faced with a negative external shock (under which the mentioned authors imply an increase in foreign interest rates), central banks operating in two-currency monetary systems tend to be more restrictive compared to central banks that do not function in dollarized economies. Besides that, on the global level the global economic crisis led to the use and development of new tools for risk management in banking sector (Abdesslem, Pascal, 2014).

In the case of our country, the fact that the dominant part of the loan is denominated or indexed in euro makes the direction of the ECB’s monetary policy more likely to affect the cost of the loan (and therefore the aggregate demand) than the change in the key policy rate of the NBS. Moreover, the success of the inflation targeting in Serbia depends on comprehension and assessment of the impact of pass-through of the exchange rate on prices.

Numerous researches have shown that the classical channels of monetary transmission do not work in the financial system of our country which is highly euro oriented, that is, that the exchange rate channel becomes dominant channel of influence on the level of inflation and even
the goal itself (Šoškić, 2016). In his study Šoškić noticed that for a more efficient monetary policy, i.e. a lower and more stable inflation rate, which is also within the defined inflation target, it is necessary to influence the reduction in level of dollarization (euroization), which would contribute to the smooth functioning of the traditional monetary transmission channel.

CONCLUSION

Experience of a great number of countries has shown that ensuring price stability, in the medium term, is a prerequisite for achieving other important macroeconomic goals - stable and sustainable economic growth, employment growth and improvement in the living standards. It is therefore not surprising that a large number of modern central banks emphasize the establishment and maintenance of price stability as one of the basic goals of monetary policy implementation, i.e. the preservation of the purchasing power of the national currency.

Central banks of many countries around the world function in some of the contemporary monetary policy regimes. Depending on the specificity of the particular economy, the chosen regime may prove to be adequate or inadequate. Compared to other strategies, inflation targeting provides the wider public with the clearest explicit goal, and places more emphasis on the transparency of central bank operations, the improvement of their credibility and accountability in monetary policy management.

The strategy proved to be more efficient in lowering the rate of inflation compared to the strategy of targeting monetary aggregates. Moreover, apart from lowering the inflation rate, it has been empirically confirmed that a large number of countries have managed to increase the credibility and transparency of monetary policy in general through the implementation of inflation targeting.

Taking into account that Serbia is an import dependent highly dollarized economy characterized by recent inflationary past and, in general, public mistrust in domestic currency, in addition to choosing the appropriate monetary policy regime the monetary authorities in our country have to pay special attention to the foreign exchange rate mechanism.

Consequently, comprehension and assessment of the impact of pass-through of the exchange rate on prices is crucially important for the success of inflation targeting in Serbia. This is supported by the fact that, immediately prior to the implementation of the new monetary policy regime, the exchange rate was used as a nominal anchor in our country. In this regard, future research in this field should focus on the impact of the pass-through of the exchange rate on prices in the Serbian economy.

ACKNOWLEDGMENTS

This paper is written as a part of the research projects OI179015 (Challenges and Prospects of Structural Changes in Serbia: Strategic Directions for Economic Development and Harmonization with EU Requirements) and III47009 (European Integrations and Social and Economic Changes in Serbian Economy on the Way to the EU), financed by the Ministry of Education, Science, and Technological Development of the Republic of Serbia.

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<th>Article history:</th>
<th>Received: July 18, 2019</th>
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<td>Accepted: August 19, 2019</td>
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