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**CONTEMPORARY ISSUES IN  
ECONOMICS, BUSINESS  
AND MANAGEMENT**

**Editor  
Verica Babić**



**FACULTY OF ECONOMICS  
UNIVERSITY OF KRAGUJEVAC**

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**Edited by**

Verica Babić, Ph.D.

**FACULTY OF ECONOMICS  
UNIVERSITY OF KRAGUJEVAC  
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## PREFACE

The Proceedings is the result of the fifth biennial International Scientific Conference on *Contemporary Issues in Economics, Business and Management* (EBM 2018), organized by the Faculty of Economics – University of Kragujevac, on 9<sup>th</sup> and 10<sup>th</sup> of November, 2018. The Conference provided an opportunity for all those interested in various fields of economics, business and management to discuss their research and to exchange ideas. This year, we brought together about 120 young and experienced researchers, PhD students, post-doctoral researchers, academicians, and professionals from business, government and non-governmental institutions, from ten different countries, i.e. Republic of Serbia, Poland, Russia, Spain, Germany, Slovenia, Japan, Croatia, Republic of Bosnia and Herzegovina, Hungary. The Conference EBM 2018 included plenary session and five parallel sessions. As distinguished researchers in the appropriate fields of economics and management, the keynote speakers at the Conference were as follows: Darko Tipurić, Boris Begović and Vadim Kufenko.

Taking into account complexity and diversity of contemporary issues in economics, business economics and management, the Proceedings of the Conference consist of following sections: *Key Issues in Management and Marketing, Globalization and Regionalization, Accounting and Business Finance and Applied Informatics and Quantitative Methods in Economics and Management*.

First section dedicated to *Key issues in management and marketing*, encompasses the papers highlighting different relevant topics and areas of research, such as knowledge management and its application to diverse organizations, organizational design and learning and their implications for knowledge management, internal and external mechanisms of corporate governance, factors and drivers of innovation management and entrepreneurship, as well.

Taking into account contemporary research models and results of empirical studies, the second section dealing with *Key issues in management and marketing* involves the papers in which various aspects of human resource management, corporate social responsibility, digital marketing as well as Industry 4.0 were considered. Particular attention was given to protection of data in the area of mobile commerce.

The section *Globalization and regionalization* is focused on considering the key economic challenges in the Republic of Serbia and the Western Balkans region, such as: economic development, macroeconomic stability, stability of financial system, state and perspectives on financial market development, competitiveness, innovativeness and efficiency of economic policy. The importance of reconsidering the current macroeconomic paradigms aimed to achieve sustainable economic development is particularly emphasized.

Papers within the section *Accounting and business finance* are generally dedicated to diverse aspects of contemporary financial management of modern corporations, and particularly to the role of managerial accounting instrumentarium in modern business environment, as well as on the importance of alternative approaches to budgeting, such as zero-based budgeting and rolling budgeting.

In the section dedicated to *Applied Informatics and Quantitative Methods in Economics and Management*, the papers consider application of modern informatics and quantitative methods, models and techniques, such as text clustering methods, evolutionary algorithms for complex optimization problems, artificial neural networks for determination of technology acceptance model parameters, DEA method, contemporary approaches to digitalization in managing the cadastral data based on blockchain methodology, as well as the application of modern information systems.

A high number of participants at the Conference are a good indicator that the Conference EBM 2018 offers a great opportunity for scholarly exchange and networking. All the papers have been reviewed and we hope that these Proceedings provide valuable knowledge for academics, professionals and students. Therefore, we would like to thank to all authors who have contributed to the success of the conference in our common response to the above challenges.

*Editor*

*Verica Babić*

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## TRANSMISSION MECHANISM OF MONETARY POLICY IN SERBIA – SUPPORT FOR THE PRIVATE AND PUBLIC SECTOR?

Zenaida Šabotić<sup>1</sup>, Ernad Kahrović<sup>2</sup>

**Abstract:** *It has been almost ten years since inflation targeting was introduced in Serbia as a monetary policy regime after a long period of high inflation, economic stagnation, high unemployment and structural underdevelopment. Under such conditions, there is no certainty of the success of any single monetary policy regime. There is no full agreement and clear evidence of the pronounced benefits of the monetary regime of targeted inflation against the rest, but this regime provides an additional incentive for the analysis and understanding of the transmission mechanism. The unstable and turbulent environment, as well as the internal problems of the countries in transition, put even more restrictions and challenges on the monetary policy makers in terms of the operation of the selected monetary policy instruments. On the one hand, for the successful realisation of economic objectives (inflation rate, unemployment rate, economic growth and development), a consistent monetary policy is needed, given the time lag of the effects of monetary measures; on the other hand, it is necessary to adapt to the changed requirements and market conditions. Especially in countries in transition, the action lag is emphasised, which is significantly shorter in the developed countries. Monetary policy is at center stage in discussions about how to promote sustainable growth and low inflation. Due to the large budget deficits of most developing countries, and due to suspicion of the ability of fiscal policy to achieve the desired stabilization results, the consensus of economists and politicians about the primary role of monetary policy in stabilizing production and inflation has been achieved. The paper will analyse the effects of the chosen monetary policy regime in Serbia, whose understanding requires a good knowledge of the transmission mechanism, through analysis of the level of inflation, unemployment, exchange rate variability, interest rate movements after the introduction of the targeted inflation regime in private and public sector. Although the effects of the monetary policy on real economic trends depend on the effects of other economic policies, primarily fiscal policy, the analysis will focus on the successful realisation of the defined inflationary target. The paper will present the basic theoretical settings of the target inflation regime, the transmission channels of monetary policy and the contribution and relevance on real sector in Serbia.*

**Key words:** *Monetary policy, Inflation targeting, Transmission mechanism, Key policy rate*

**JEL Classification:** *E58, G38, H60*

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## INTRODUCTION

Periods of high inflation rates in most developing countries have imposed price stability as the long-term primary objective of monetary policy. Although the coordination of monetary and fiscal policy is necessary for the realization of economic goals, there is agreement among the economists and politicians about the more significant role of monetary policy in the realization of selected goals. Although the time lag of the effects of monetary and fiscal policy is similar (about 24 months), priority is given to monetary policy, because it is more independent in terms of achieving economic goals and less susceptible to changes due to large budget deficits. Therefore, it is not surprising that in recent years inflationary targeting has gained importance as a monetary policy regime, and that has been applied in a large number of countries. There is no monetary policy regime that would be equally effective in all the countries that apply it. It is therefore not surprising that in the previous period, the monetary authority in Serbia applied several different monetary policy regimes, which carried with them different primary goals and instruments for their realisation. The implementation of different regimes is due to the changing circumstances and factors in the domestic economy, as well as the situation in the world economy. Problems are particularly evident in underdeveloped, transit economies, although further use of this term is debatable. Nevertheless, in such economies, the inconsistency in defining the primary goals and the use of monetary policy instruments for their realisation may be a major problem in achieving the positive effects of using it. But given the fact that the application of monetary policy is conditioned by the state of the economy, which is constantly changing in the transit period, then its constant change is not surprising, as a result of the devaluation of the effects that should have been achieved.. The National Bank of Serbia (NBS) has been officially implementing the inflation targeting regime as its main monetary policy strategy since 2009. The key policy rate will be the main monetary policy instrument in the inflation targeting regime. Other monetary policy instruments, including interventions in the foreign exchange market, will only have supporting roles. Main channels of the monetary policy transmission mechanism are interest rate channel, exchange rate channel, asset price channel, with two credit channels: bank lending channel and balance-sheet channel. In developed market economies, the interest rate channel represents the most significant channel of the monetary policy transmission mechanism. In Serbia, its significance is still limited. Monetary policy affects net export through the impact of the interest rate on the exchange rate. Higher interest rates mean stronger currency, and stronger currency leads to a decline in net export demand and output, and vice versa. Interest rate changes also affect prices of imported goods and services leading to a direct price hike (with products that are exclusively or predominantly of imported origin) or indirect price hike (through the rise in costs of imported components in domestic products). This is a very important channel in Serbia. Monetary policy affects households and economy through the effect of the interest rate policy on the valuation of equities. Higher interest rates bring equity prices down. Lower equity values lead to a drop in financial wealth, and less wealth means less spending. Low value of equities relative to the replacement cost of capital results in reduced investment spending. When we talk about bank lending channel, it is particularly important in the countries where banks play a significant role in the financial system. As long as there is no perfect substitutability of economic entities' bank deposits with other sources of funds, the bank lending channel of monetary transmission stay a highly significant channel in Serbia. Interest rates affect balance sheets, cash flows and net worth of companies and consumers. Higher interest rates result in reduced cash flow, reduced net worth, drop in loans, and decline in aggregate demand, whereas adverse selection and moral hazard grow in significance. This paper will provide an overview of inflation target regime and his implementation in Serbia, as well as the transmission mechanism of monetary policy: the process through which monetary policy decisions are transmitted into changes in real GDP and inflation.

## LITERATURE REVIEW

Targeting inflation is the "youngest" monetary policy regime, first applied in 1990 in New Zealand. However, as early as next year, Canada begins to apply this regime, in 1992, the United Kingdom, and in 1993 Sweden and Finland. Then, Australia and Spain (1994) went through the same regime, followed by Israel, Brazil and Chile, and today, according to IMF there are 28 countries that use inflation targeting, fixing the consumer price index as their monetary policy goal. Three other countries—Finland, the Slovak Republic, and Spain—adopted inflation targeting but abandoned it when they began to use the euro as their currency.

The Czech Republic was the first transition country to introduce it in 1997. The main elements of this regime are: the need to publicise a medium-term inflation target; the obligation to define price stability as a primary goal of monetary policy; full information about all the variables used in making decisions, and not only monetary aggregates; transparency of the monetary policy strategy and growth of the central bank's responsibility for achieving the primary goal. Misconceptions related to this monetary policy regime could be reduced to the following. First, as Mishkin (Mishkin, 2001) points out, inflation targeting is a framework for monetary policy, not a rule. Every monetary policy, if it seeks to be coherent and purposeful, is placed in some conceptual frameworks, and it is just the question of how much that concept is clearly defined. According to Bernanke (Bernanke, 2003) inflationary targeting provides a single, coherent framework for thinking about monetary policy choices, with the involvement of the public. If, in this context, monetary policy succeeds in achieving the goals of directing inflationary expectations, the achievement of the ultimate goals is significantly facilitated. Another misconception concerns the assumption that inflationary targeting is exclusively based on inflation control, ignoring the goals of growth and employment. And as the last misconception that Bernanke points out, it refers to the assumption that inflation targeting is not consistent with the central bank's commitment to maintaining financial stability (the US example). Mishkin (Mishkin, 1996) gives us an overview of the transmission mechanism of monetary policy and emphasizes four lessons from an understanding of the monetary transmission mechanism as follows. First, it is very dangerous to always associate monetary policy easing or tightening with a fall or rise in short-term nominal interest rate. Second, other asset price besides those on short-term debt instruments contain important information about the stance of monetary policy because they are important channels of the monetary policy transmission mechanism. Third, monetary policy can be highly effective in reviving a weak economy even if short-term interest rates are already near zero. And the last one, avoiding unanticipated fluctuations in the price level is an important objective of monetary policy, thus providing a rationale for price stability as the primary long-run goal for monetary policy. His later work confirming those lessons (Mishkin, 2007; Boivin et al. 2010; Cecioni and Neri 2010). Further explanations of how transmonetary mechanism works can be found in Alkin and La Cava (2017.)

## METHODOLOGY

Having in mind commitment of monetary authority in Serbia of achieving the main goal, price stability, within inflation target regime, below will be discussed the relationship between inflation rate, GDP, key policy rate, having in mind other indicators using data from the National bank of Serbia. Time series analysis includes the period from 2005 to 2017, with more than 50 data related with central bank activity, commercial banks activities, macroeconomic indicators, and their relations and fluctuations within this period. We used univariate and multivariate linear regression analysis, correlation analysis, with the purpose to confirm relations between those indicators. Some of indicators that we used are real GDP growth rate (in %), consumer price, unemployment, key policy rate, discount rate, RSD/EUR exchange rate (average and end of period), dinar and indexed dinar savings-total, foreign currency savings-total, housing loans

(RSD, indexed to FX and FX loans), consumer loans (RSD, indexed to FX and FX loans), M1, M2, M3, foreign exchange reserves of commercial banks (EUR m), foreign exchange reserves of NBS (EUR m), etc. All data are analyzed using SPSS program, and results are presented in the next step.

### RESULTS AND DISCUSSION

By using univariate linear regression model, we see the significant relationship between inflation rate, and key policy rate, which confirms the adequate choice of the main instrument of monetary policy.

Table 1. The Relationship between consumer prices and key policy rate in Serbia, from 2005-2017.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std.Error	Beta			Lower Bound	Upper Bound
(Constant)	-0.116	2.534		-0.046	0.964	-5.763	5.531
Key policy rate	0.639	0.246	0.635	2.602	0.026	0.092	1.186

Source: Author's calculation according to NBS data

As it is shown in table 1, an increase of key policy rate for one pp leads to a significant increase in the inflation rate for 0.639 (0.092-1.186,  $p=0.026<0.05$ ). The change of key policy rate explains 40.4% of the changes in consumer prices ( $R^2 = 0.404$ ). Using the same analysis, with real GDP growth (in %) as dependent variable, and consumer prices (in %, relative to the same month a year earlier), there is no significant relation between those two variables ( $sig=0.256>0.05$ ). Graph below shows relationship between monetary and real sector, presented through movements of these variables.

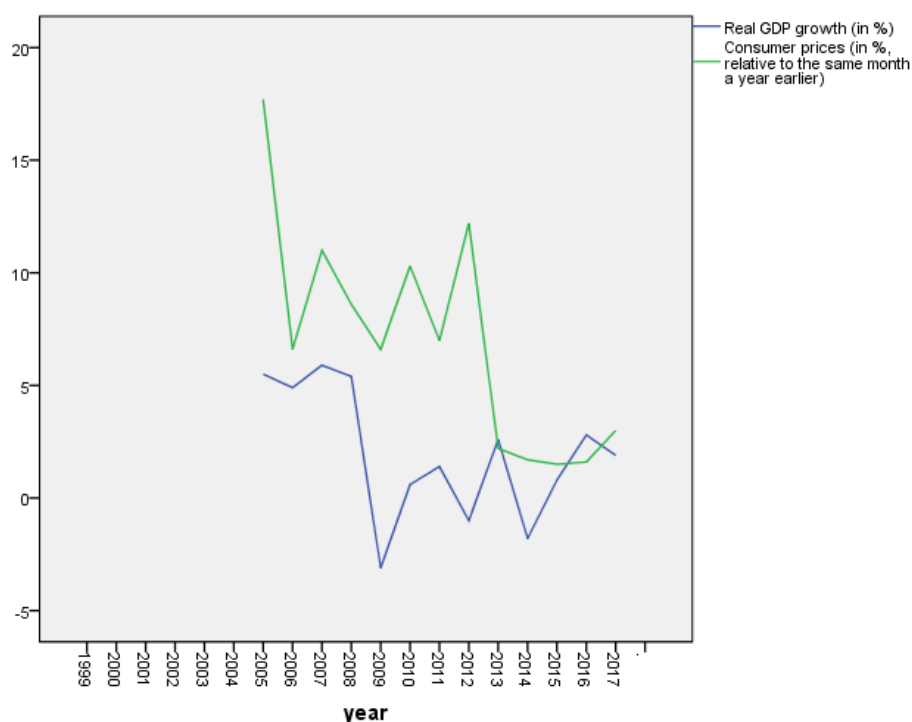


Figure 1: Relationship between consumer prices and real GDP growth rate (in %)

Source: Authors calculations according to NBS data

Relationship between consumer prices, and RSD/EUR exchange rate is evident, and shown on Figure 2 below. Every time when we had decrease of inflation rate, there is significant depreciation of exchange rate.

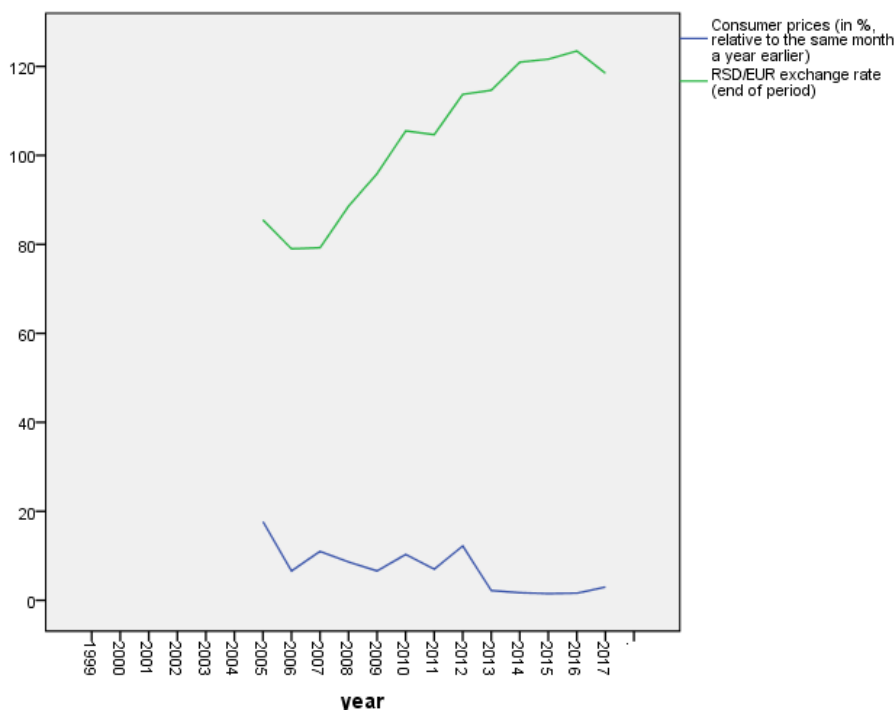


Figure 1: Relationship between consumer prices and RSD/EUR exchange rate

Source: Authors calculations according to NBS data

As it was mentioned earlier, there was no confirmation of significant relations between consumer prices and real GDP rate growth, but between RSD/EUR exchange rate and real GDP rate growth there is a significant relationship. An increase of RSD/EUR exchange rate for one unit of measurement leads to a significant decrease in the real GDP growth for 0.104 (0.010-0.198,  $p=0.033<0.05$ ). The change of RSD/EUR exchange rate explains 35% of the changes in real GDP growth rate ( $R^2 = 0.350$ ). The statistically significant correlation between the inflation rate and monetary aggregate M2 was confirmed, which supports the fact that monetary authorities can monitor the movement of this aggregate in order to achieve the target inflation rate. Due to the different presentation of these two variables, their standardized values are used. The univariate regression analysis shows that every increase of M2 for one standard deviation leads to a decrease of consumer prices for 1.038 standard deviations (0,495-1,580,  $p=0.001<0.05$ ). The change of M2 explains 61,7% of the changes in consumer prices ( $R^2 = 0.617$ ). Regarding the influence of the selected monetary policy instrument, the key interest rate on the movement of public debt, a statistically significant correlation was confirmed. An increase of key policy rate for one pp leads to a significant decrease in the RS public debt for 3.278 (1.261-5.295,  $p=0.005<0.05$ ). The change of key policy rate explains 56.7 of the changes RS public debt ( $R^2 = 0.567$ ). In the previous period the NBS continued to lower key policy rate (currently 3.00%) in order to stimulate investment activity, the public republic of Serbia records a significant increase. This is confirmed by the state of RS public debt in March 2018, with total external debt, in mil EUR from 25,445.1, within that amount, on public sector goes 13,766.2, on private sector goes 11,678.9, but on the enterprises most of that amount-9.307.7 (NBS, 2018). Offcourse, raising of key policy rate is connected to decreasing of all saving in Serbia (dinar and indexed dinar savings, as well as foreign currency savings, for 3,566.943 (2,010.465-5,123.422,  $p=0.000<0.05$ ) and 57,308.640 (24,812.482-89,804.798,  $p=.0.003<0.05$ , respectively). An increase of key policy rate as a consequence has decreased in total housing loans, for 9,586.268

(4,042.793-15,129.743,  $p=0.005<0.05$ ,  $R^2=0.749$ ). But, when we talk about the influence of movement of key policy rate on consumer loans, indexes to FX an FX loans over 5 years, we can see different results. An increase of key policy rate for one pp leads to increase of consumer loans, indexes to FX an FX loans over 5 years for 2,334.684 (1,314.366-3,355.002,  $p=0.001<0.05$ ,  $R^2=0.839$ ). For consumer loans, RSD over 5 years there wasn't a statistically significant relationship with the movement of key policy rate ( $p=0.111>0.05$ ). In the end, univariate regression analysis shows that there is a statistically significant correlation between key policy rate and total loans to households including NPISH and non-financial corporations. An increase of key policy rate for one pp leads to decrease of total loans to households including NPISH, and non-financial corporations for 48,339.038 (17,715.009-78,963.067,  $p=0.008<0.05$ ,  $R^2=0.713$ ).

## CONCLUSION

The decision of the monetary authorities in Serbia to use the inflation targeting methods and key interest rate as the main instrument of monetary policy, based on the previous analysis, seems justified. However, there are the three key elements of inflation-forecast targeting: a quantitative inflation target, an inflation forecast that plays a central role in decision-making, and transparency and accountability. Central bankers must have clear objectives and sufficient capacity and independence to provide these key elements. Most countries that adopt inflation-forecast targeting do not have all these elements in place at the outset, but in almost all cases, their modeling and forecasting capability, transparency and policy communication, and exchange rate flexibility have improved over time. Successful inflation-forecast targeting also requires a change in mindset—policymakers must accept the notion that achieving low inflation is the primary objective of monetary policy (while minimizing the variability of movements in the real economy in the course of achieving and maintaining the target rate of inflation), that central bank instrument independence is of paramount importance, and that fiscal policy concerns cannot dominate monetary policy choices. Challenges faced by the Bank of Serbia, including a highly euroized economy (that is, the euro is widely used for transactions and savings) and high food and headline inflation volatility. In such circumstances, a strong and rapid policy response in response to shocks is needed to anchor inflation expectations. Also, macroprudential policy instruments are useful in complementing conventional monetary policy instruments, and if applied carefully, can improve the effectiveness and credibility of inflation-forecast targeting regimes.

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