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Analysis of the Monetary Policy Rule in the Russian Economy

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Abstract

This article summarizes the results of an empirical study of the monetary policy in the Russian economy. The goal of the work is to establish the conformity of the regulator's policy to the "monetary policy rule". For this purpose, the monetary policy rules are assessed: from the Taylor and McCallum rules to various modifications of rules corresponding to an open economy. Models are assessed using the generalized method of moments. Empirical results are analyzed. The inertia of the regulator's policy is analyzed, and the estimated smoothing coefficients in the monetary policy rules are compared with estimates in emerging and developed countries.

Keywords: Central bank; Monetary policy; Taylor rule.

1. Introduction

Econometric analysis of monetary policy is carried out with the purpose to establish the actually conducted monetary policy of central banks.

The behavior of central banks in developed and emerging countries can be empirically described using the monetary policy rules. Such rules, when formalized by simple equations, describe how central banks respond to the development of important macroeconomic indicators, such as economic growth and inflation. The relationship between short-term interest rates, economic growth and inflation can be formally displayed using the so-called (Taylor, 1993) and its further modifications. Study of the fulfillment of Taylor and other rules allows to find out what reaction of the economy actually arises in response to the regulator measures, and what its efficiency is. This knowledge allows to make better decisions reflecting the actual efficiency of economic processes.

At the same time, there are few and controversial studies of monetary policy rules for the Russian economy: (Drobyshevskiy *et al.*, 2009; Vdovichenko and Voronina, 2004; Yudaeva *et al.*, 2010).

According to Taylor's assumption, the short-term interest rate is an instrument of the central bank, the regulator of monetary policy. He also assumes that the central bank uses its interest rate policy to respond to deviations of actual inflation from inflation targets, as well as deviations of actual GDP from potential. The positive deviation of the output occurs in case of economic recovery, while negative occurs in the conditions of economic recession.

Denoting rt as a nominal interest rate implemented in period t, Taylor's monetary policy rule can be formally represented as follows:

$$r_t = rr + \pi_t + \alpha(\pi_t - \pi^*) + \beta x_t, \qquad (1)$$

where $\alpha > 0$, $\beta > 0$ are constant weighted coefficients, π_t is inflation in the period t, π^* is inflation target of the central bank, and x_t is deviations of the actual GDP from the expected value. Besides, rr is the equilibrium real interest rate. This rule is approximated on average, for a long period of observation, actually observed post factum real interest rates (nominal interest rate minus inflation level).

In equation (1), this Taylor rule can be interpreted as a function of the central bank response. The equation indicates that if the nominal rate is in a situation where the inflation rate is equal to the inflation target of the central bank, while there is no deviation of actual GDP from the expected value, then the result is the sum of the equilibrium real interest rate and the inflation target of the central bank. If inflation rises above the provided inflation target of

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the central bank, then the monetary policy becomes restrictive by raising the interest rate. Since the central bank reacts both to deviations in inflation and to deviations in output, the weighted coefficients are applied.

In accordance with the rule, the monetary policy should become tighter, which is expressed by an increase in rt in cases when inflation exceeds the target.

However, some drawbacks underlying the formalization of Taylor rule led to the development of numerous variants of Taylor rules in the literature.

The assumption that central banks essentially take monetary policy decisions based on economic trends observed during the decision-making period or in the period before that is hardly realistic. It seems more plausible to argue that decisions based on expectations regarding the future economic development play a central role for the monetary policy.

These objections allowed (Clarida *et al.*, 1998;2000) to develop a model of a monetary policy rule built on projected values.

The nominal interest rate of the central bank, rt* depends on the equilibrium nominal interest rate $\bar{r}$, expected deviations of inflation and expected deviations of output:

$$r_t^* = \bar{r} + \alpha[E_t(\pi_{t+k}|\Omega_t) - \pi^*] + \beta E_t(x_{t,q})|\Omega_t), \qquad (2)$$

where $\alpha > 0$ and $\beta > 0$ are constant weighted coefficients, E_t is an expectation operator, Ω is all available information at the time of setting the interest rate.

Equation (2) means that the regulator can rely on economic expectations of future development periods when developing its percentage target.

According to Clarida *et al.* (1998), the specification of the regulator response function described above is too restrictive to be useful as a model for changing the actual rate and ignores the regulator's desire to smooth out changes in interest rates. In their opinion, simple extension of the model allows to weaken these assumptions, which increases the chances of ensuring a good econometric estimation of data. In particular, Clarida *et al.* (1998) proposed the following model of the actual rate as a gradual adjustment of the interest rate policy:

$$r_t = (1 - \rho)r_t^* + \rho r_{t-1} + u_t, \qquad (3)$$

where r_{at}^* is a target rate and ρ is a smoothing parameter, $0 < \rho < 1$.

Empirical estimates reveal that the lagged interest rate is statistically significant and improves the estimate. This phenomenon is called percentage smoothing in the literature. There can be a more complex lagging structure, but a one-lag model is the most common specification.

A lagged structure with a smoothing parameter leads to the fact that the Central Bank makes no attempts to eliminate the difference between the market rate and the target rate in full in each period, but carefully leads the actual rate to the target interest rate.

Substituting equation (2) into equation (3) and finding how $\delta \equiv \bar{r} - \alpha\bar{\pi}$, it results in:

$$r_t = (1 - \rho)[\delta + \alpha E_t(\pi_{t+k}) + \beta E_t(x_{t,q})] + \rho r_{t-1} + u_t. \qquad (4)$$

Since the predictive Taylor rule does not work in this form, equation (4) is transformed into:

$$r_t = (1 - \rho)[\delta + \alpha\pi_{t+k} + \beta x_{t,q}] + \rho r_{t-1} + \varepsilon_t, \qquad (5)$$

where ε_t is found as

$$\varepsilon_t \equiv (1 - \rho)\{\alpha[E_t(\pi_{t+k}) - \pi_{t+k}] + \beta[E_t(x_t) - x_t]\} + u_t$$

Equation (5) allows to empirically verify whether the central banks include expectation of the interest rate policy in their decisions regarding the plans for further economic development. It can also be verified whether central banks work with a smoothing interest rate. Besides, target inflation $\bar{\pi}$ can be determined by a real interest rate for a given equilibrium.

The Taylor rule was developed for a closed economy (US), where the exchange rate of the money transfer plays a minor role in the spread of monetary impulses.

A simple rule based on the monetary conditions index (MCI) was proposed for the open economy, entailing the adjustment of the nominal interest rate to ensure that the real money terms did not change over time. The Ball L Policy rules for open economies (1999) is a less simple specification of the MCI-based rule, where policymakers change the combination of interest and exchange rates in response to deviations from target inflation and output from potential. A set of alternative rules for an open economy was developed on this basis.

(Mccallum, 1993`) proposed a rule where the monetary base was used as an instrument instead of the interest rate. The Taylor rule tracks the change in the interest rate in response to changes in inflation and output, while the McCallum rule tracks the change in the monetary base depending on changes in GDP and the velocity of money. There is also a combined rule that unites the combinations of regressors from the Taylor rule and the McCallum rule.

Russia belongs to countries with a high level of the economy openness, i.e. countries with a large share of exports and a large share of imports in consumption. Accordingly, the monetary policy in the Russian economy depends on the behavior of the exchange rate, in addition to the two main targets: inflation and GDP. Therefore, the change in the ruble exchange rate is considered as one of the target variables in the monetary policy rule.

2. Methods

Russian researchers believe that the instrument of the monetary policy in the form of the interest rate presented in the classical Taylor rule is a more adequate tool for developed economies. It is better to use monetary aggregates as a tool of monetary policy for Russia, because the impact of the Central Bank on the interest rate has traditionally been limited (Yudaeva, 2014), (Drobyshevskiy *et al.*, 2009), (Yudaeva *et al.*, 2010).

In regard to choosing the instrument of the monetary policy, it can be noted that the monetary base is a monetary aggregate more dependent on the Central Bank impact. The monetary base is interconnected with the implementation of banks refinancing, conducting foreign exchange interventions and direct quantitative restrictions.

The Clarida, et al. approach can be used to test the hypothesis that the exchange rate affects the policy tool, since it is an indicator of future trends in inflation and output.

The reaction of the interest rate to the exchange rate includes the direct channel through which the central bank adjusts the interest rate to prevent the exchange rate from wandering too far from the target level.

The relationship between the exchange rate and the short-term interest rate as a result of monetary policy depends on the sign of the coefficient. If the coefficient is positive, it means that when the currency depreciates, the expected inflation tends to increase.

An important consequence of this is that if the central bank does not focus on the exchange rate, the bank's desire to stabilize the inflation forecast will lead to an increase in the nominal and real interest rates as currency depreciation and, on the contrary, reduction in nominal and real interest rates while strengthening the currency.

Stabilization of the exchange rate can promote the stabilization of production and reduce inflation to the target level. Taylor (2002) reveals that when financial markets are poorly developed – for example, in the case of emerging markets, – the central banks play a decisive role in managing the expectations of economic agents.

When describing the inflation targeting scheme, Yudaeva (2014) believes that the ruble exchange rate can be influenced not only by currency interventions, but also by such a regulator tool as interest rates. In this case, raising interest rates makes assets in rubles more profitable and speculation against it unprofitable. Unlike developed countries, regulators of emerging market countries have larger influence on the exchange rate.

If the monetary aggregates and the exchange rate are targeted, the model can be represented as follows:

$$r_t^* = \alpha + \beta E[\pi_{t+n}|\Omega] + \gamma E[x_t|\Omega_t] + \xi E[z_t|\Omega_t]. \tag{6}$$

where z_t is monetary aggregate, exchange rate, etc., i.e. an added variable.

Equation (5) cannot be estimated using the least squares method, since the regressors are not independent of the remainder of the equation.

To assess these equations, the Generalized Method of Moments (GMM) is used, proposed by Hansen (1982).

The GMM method does not require a normal distribution of changes in variables. If the remainders have conditional heteroscedasticity, the GMM estimates and their standard errors are consistent in this case as well.

If the dimension of the tool vector exceeds the number of parameters under estimation, they are overidentification models. The model can be verified using J-statistics, which refers to the estimated parameter vector or the estimated covariance matrix. This J-statistic has χ2-distribution, which differs by the fact that the number of degrees of freedom can be seen from the number of instruments minus the number of parameters to be estimated. The null hypothesis of this test is that more identifying restrictions are permissible.

The exogenicity of the tools was tested using a Wu-Hausman test. The lack of autocorrelation of the remainders was tested using an acceptable level of Durbin-Watson statistic.

3. Empirical Data

The monthly data of the Russian economy from 01.2003 to 06.2015 have been used in the work, taken from the websites of Rosstat (Russian Federal State Statistics Service) and the Bank of Russia.

All variables have been converted to incremental type in relation to a similar indicator value from a year ago. The indicators of monetary aggregates, real output, industrial production and effective exchange rate were used in a logarithmic form.

The official forecasts published annually by the Bank of Russia in the "Monetary Policy Guidelines" were used as the target values of inflation and monetary base variables. A conversion using the Hodrick-Prescott (HP) filter was used to obtain target values for the output of both the industry and the core sectors of the economy, along with the exchange rate.

The Bank of Russia adopted such tools as a rate on direct REPO operations, as well as a monetary base in the form of growth rates. Inflation, output and exchange rate were taken as possible independent variables influencing the regulator's policy. A REPO rate is taken as the interest rate tool, because the Bank of Russia provides liquidity to the banking sector using the REPO mechanism to a greater extent. The monetary base can be considered more dependent on the actions of the Central Bank using the monetary aggregate.

In the assessment using the GMM method, lags (1 to 7) of various variables were taken as instrumental variables: target variables – inflation, REPO rates, monetary base; intermediate goals of monetary policy – output in the form of indicators of industry and basic industrial sectors, exchange rate, inflation difference and inflation targets, monetary aggregates, BRENT oil prices, interest rates, FRS index.

Proceeding from the Taylor rule, it can be assumed that the regulator will change the value of its target instrument based on the future (projected) values of the most important indicators. In other words, the regulator sets the value of the interest rate or monetary base as a response to the projected values of inflation and output to have a regulatory effect on the deviation of these indicators from the target values.

Besides, there is a variation of the Taylor rule for open economies, which considers the exchange rate as an additional target variable.

4. Results

The classical Taylor rule can be represented in the following form for practical assessment:

$$r_t = (1 - \rho)\delta + \alpha(\pi_{t+k}^E - \pi^*) + \beta(x_{t,q}^E - x^*) + \rho r_{t-1} + \varepsilon_t, \tag{7}$$

(farming Where π_{t+k}^E, $x_{t,q}^E$ are expected inflation and output values,
π*, x* are target values of inflation and output for the regulator.
If the monetary base is added as a regressor (mb):

$$r_t = (1 - \rho)\delta + \alpha(\pi_{t+k}^E - \pi^*) + \beta(x_{t,q}^E - x^*) + \varphi(mb_{t,q}^E - mb^*) + \rho r_{t-1} + \varepsilon_t, \tag{8}$$

Where $(mb_{t,q}^E - mb^*)$ is the difference between the projected and target value of the monetary base.
If the exchange rate is included:

$$r_t = (1 - \rho)\delta + \alpha(\pi_{t+k}^E - \pi^*) + \beta(x_{t,q}^E - x^*) + \varphi(rm_{t,q}^E - rm^*) + \rho r_{t-1} + \varepsilon_t, \tag{9}$$

Where $(rm_{t,q}^E - rm^*)$ is the difference between the projected and the target exchange rate.
If the monetary base is taken as a regulator tool:

$$mb_t = (1 - \rho)\delta + \alpha(\pi_{t+k}^E - \pi^*) + \beta(x_{t,q}^E - x^*) + \varphi(rm_{t,q}^E - rm^*) + \rho mb_{t-1} + \varepsilon_t, \tag{10}$$

Table 1 presents the results of the assessment according to equation (7), where the REPO rate is the policy instrument.

Table-1. Results of the monetary policy assessment according to the classical Taylor rule (author's calculations)

Dependent variable REPO	ρ smoothing coefficient	δ free term of the equation	A coefficient at inflation	β coefficient at output	Coefficient of determination	J-statistics
Coefficient value	0.776	4.719	0.106	-0.066	0.83	16.96
Standard error	0.0166	0.418	0.044	0.033		
t-statistics	46.764	11.282	2.404	-2.009		
The critical value of χ2 is 32.67 at the significance level of 5%						
In the "*forward looking*" form for the 3-months lag for inflation and 1-month lag for output						
Coefficient value	0.801	2.752	0.378	-0.279	0.82	15.17
Standard error	0.0182	0.572	0.056	0.040		
t-statistics	43.89	4.810	6.68	-6.95		
The critical value of χ2 is 32.67 at the significance level of 5%						
In the "*forward looking*" form for the 6-months lag for inflation and 1-month lag for output						
Coefficient value	0.828	4.098	0.240	-0.231	0.826	16.15
Standard error	0.019	0.581	0.061	0.048		
t-statistics	43.08	7.052	3.92	-4.83		
The critical value of χ2 is 32.67 at the significance level of 5%						
In the "*forward looking*" form for the 12-months lag for inflation and 1-month lag for output						
Coefficient value	0.766	5.017	0.098	-0.146	0.816	15.00
Standard error	0.0212	0.293	0.033	0.034		
t-statistics	35.26	17.114	2.97	-4.29		
The critical value of χ2 is 32.67 at the significance level of 5%						

All the found coefficients are statistically significant. Along with a constant, 25 instruments were adopted: indicators of lag variables of inflation, target inflation, output, target monetary base, BRENT oil prices, and interbank rates. The test J-statistics is 16.96 and hence significantly lower than the critical value of 32.67 (5% of the significance level). As such, more identifying restrictions are taken.

The value of the smoothing coefficient from the established coefficients is 0.77. This shows that the interest rate policy is fairly smooth. The regulator strives to avoid large variability. The coefficient at inflation is low – 0.106, and at output it is (-0.006). A low coefficient at inflation says that there is no real inflation targeting by the regulator in this period.

Finally, the implicit inflation target p□ can be calculated from the constants in accordance with the following formula:

$$\pi = \frac{rr - \delta}{\alpha - 1}$$

This formula is derived from the ratio $\delta = \bar{r} - \alpha\bar{\pi}$ and the determination of the equilibrium nominal interest rate $\bar{r} = rr + \bar{\pi}$. Assuming the value of the equilibrium real interest rate rr as 2.0%, an estimate for the target inflation value is obtained as a point next to 3.04%, and the estimate for 2.5% will be 2.48%.

The results of the interest rate assessment over time for the target inflation of 2.5% are shown in (Figure 1):

Figure-1. Chart of the actual REPO rate and the estimated target rate in the assessment range. Compiled by the author
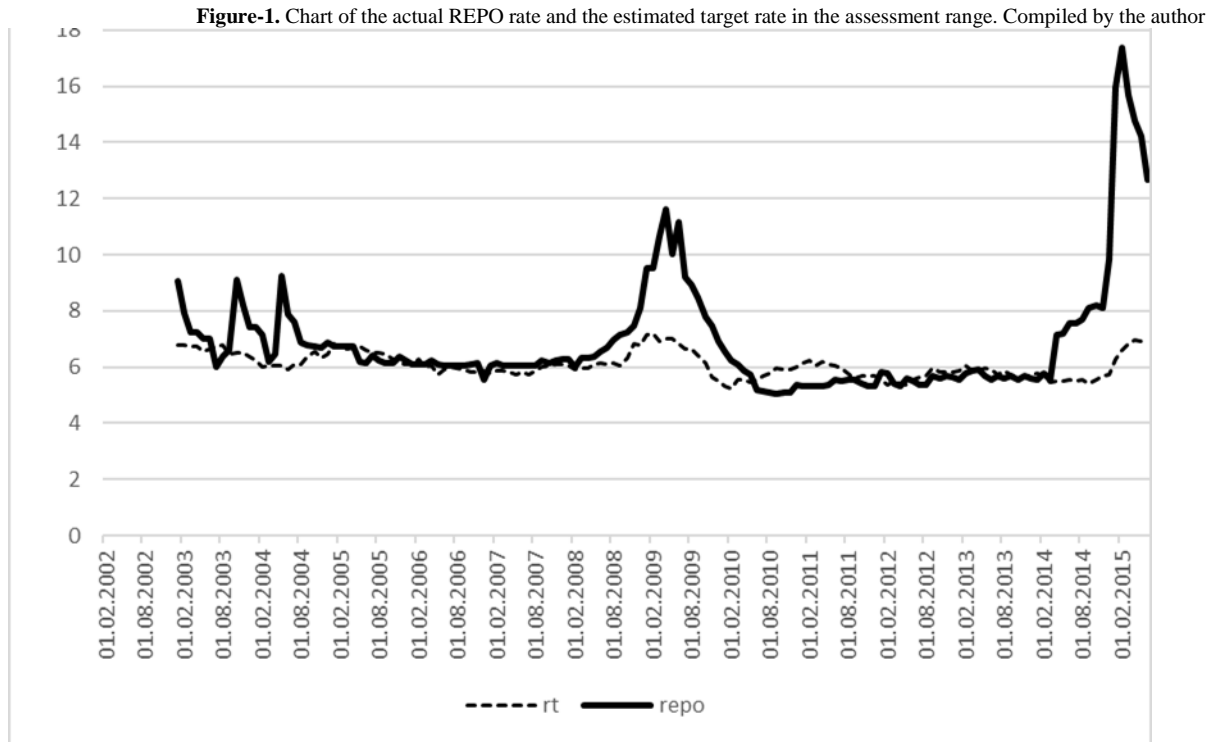
Table 1 also provides estimates for a "forward-looking" case, for the lag of the inflation forecast of 3, 6 and 12 months and 1 lag for output, respectively. All options are statistically significant. The use of projected indicators to estimate the interest rate does not lead to a positive value of the coefficient at output (for developed economies it usually helps achieve a positive coefficient at inflation.) But the coefficients at inflation and output grow, which leads to an improvement in the predictive capabilities of the evaluation curve (Figure 2).

Figure 2. Chart of the actual and estimated target REPO rate and the estimated "forward-looking" target charts for 3, 6 and 12-months' lags. Compiled by the author
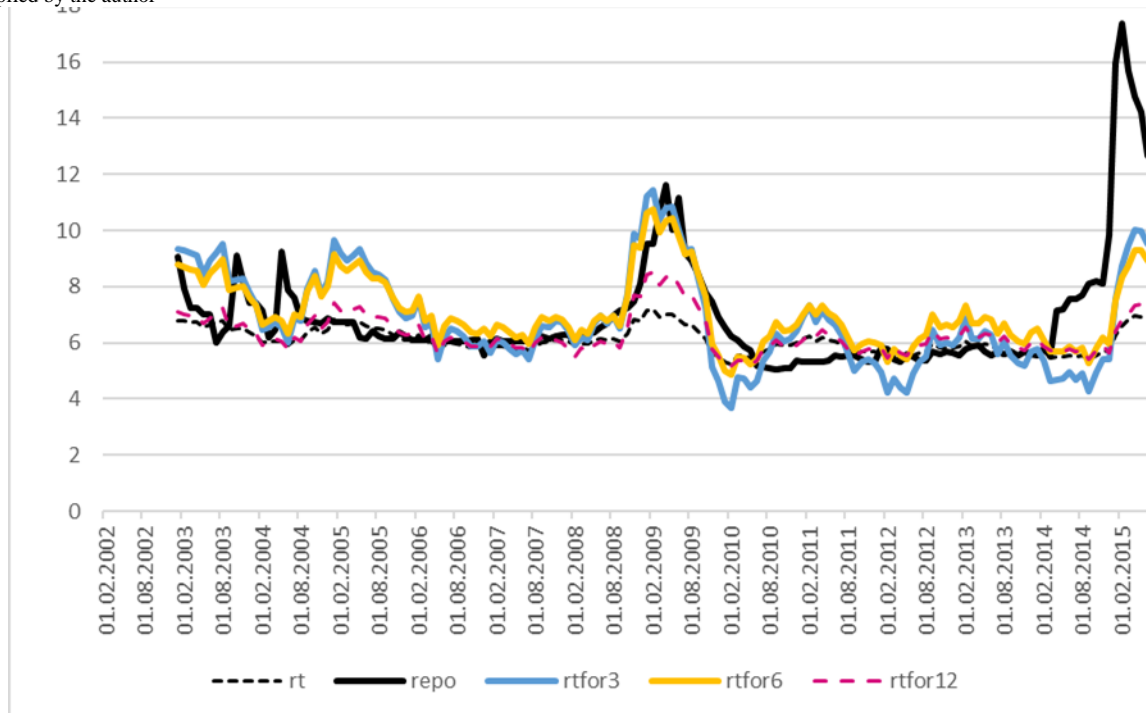
The monetary policy rule for the interest rate was evaluated without considering the money in the previous version. Now the option is considered with the inclusion of the monetary base to the function of the interest rate response. In this case, the monetary base can be included in the regression equation as an additional regressor or an additional tool. Inclusion of the money supply in the set of instruments is justified by a test based on J-statistics.

Table 2 provides the indicators for assessing the monetary policy with REPO as an instrument and inclusion in the monetary base equation using equation (8).

Table-2. Results of the assessment of the monetary policy under the Taylor rule with a monetary base. Author's calculations

Dependent variable REPO	ρ smoothing coefficient	Δ free term of the equation	α coefficient at inflation	β coefficient at output	φ coefficient at monetary base	Coefficient of determination	J-statistics
Coefficient value	0.808	-4.356	0.360	-0.064	0.896	0.86	16.15
Standard error	0.0143	1.916	0.042	0.028	0.192		
t-statistics	56.327	-2.274	8.480	-2.274	4.29		
The critical value of χ2 is 33.92 at the significance level of 5%							
In the "*forward looking*" form for the 3-months' lag for inflation and 1-month lag for output and 1-month lag for monetary base							
Coefficient value	0.8373	-6.574	0.347	-0.094	1.089	0.828	19.09
Standard error	0.014	2.800	0.061	0.0327	0.270		
t-statistics	59.10	-2.348	5.685	-2.885	4.029		
The critical value of χ2 is 38.88 at the significance level of 5%							

The smoothing coefficient is rather high – 0.808, the coefficient at inflation becomes more significant – 0.36, the coefficient at output remains at the same level – (-0.064), but the value of the coefficient at the monetary base equal to 0.896 suggests the real significance of the monetary base in the monetary policy. Indicators in the "forward-looking" option suggest an even greater importance of the monetary base.

Table 3 also shows the indicators describing the assessment of the monetary policy for such tool as REPO rate, but with the addition of the exchange rate, i.e. for an open economy by the equation (9).

Table-3. Results of the assessment of the monetary policy for an open economy with the addition of an intermediate goal in the form of the exchange rate. Author's calculations

Dependent variable REPO	ρ smoothing coefficient	Δ free term of the equation	α coefficient at inflation	β coefficient at output	γ coefficient at exchange rate	Coefficient of determination	J-statistics
Coefficient value	0.847	3.565	0.224	-0.278	17.468	0.849	8.134
Standard error	0.020	0.592	0.069	0.117	6.977		
t-statistics	41.449	6.022	3.212	-2.379	2.503		
The critical value of χ2 is 19.67 at the significance level of 5%							
In the "*forward looking*" form for the 12-months' lag for inflation and 1-month lag for output and 12-months' lag for exchange rate							
Coefficient value	0.685	4.510	0.170	-0.100	-4.042	0.812	16.827
Standard error	0.0217	0.182	0.0196	0.0194	1.0852		
t-statistics	31.516	24.736	8.685	-5.156	-3.725		
The critical value of χ2 is 40.11 at the significance level of 5%							

This option indicates the real significance of the exchange rate, and not very high significance of inflation.

Table 4 provides the results of the assessment for an open economy with the addition of a tool in the form of the monetary base according to equation (10).

Table-4. Results of the assessment of the monetary policy for an open economy with the aim of regulator in the form of the monetary base. Author's calculations

Dependent variable REPO	ρ smoothing coefficient	Δ free term of the equation	α coefficient at inflation	β coefficient at output	γ coefficient at exchange rate	Coefficient of determination	J-statistics
Coefficient value	0.984	7.967	0.120	0.188	7.283	0.99	21.2
Standard error	0.0032	0.444	0.059	0.058	3.13		
t-statistics	307.82	17.939	2.014	3.215	2.319		
The critical value of χ^2 is 52.16 at the significance level of 5%							
In the "*forward looking*" form for the 6-months' lag for inflation and 1-month lag for output and 1-month lag for exchange rate							
Coefficient value	0.988	7.631	0.196	0.151	7.284	0.994	18.91
Standard error	0.003	0.581	0.087	0.05	2.449		
t-statistics	347.84	13.14	2.258	3.027	2.974		
The critical value of χ^2 is 52.16 at the significance level of 5%							

In this case, there are a high smoothing coefficient, an insignificant factor at inflation, a positive but low coefficient at output, and a highly significant coefficient at the exchange rate. The "forward-looking" option only slightly increases the significance of inflation.

To achieve the target inflation rate, a coefficient at inflation must be >1 – in this case, the regulator has a stabilizing effect. This value was not established in any of the options. This means that inflation was not the goal in the period under assessment.

It must be noted that the coefficients at inflation, output and exchange rate are very sensitive to the choice of tools.

The obtained results can be interpreted as the use of various intermediate goals by the regulator in the period under study: interest rates, money supply and the exchange rate.

However, in the period under assessment, the Bank of Russia takes more action to regulate the real exchange rate: the coefficients at the exchange rate are >1 both in the equation at the target REPO instrument and at the monetary base. It is obvious that the regulator pursued a policy of modified targeting in the period under assessment. It assumes that together with the main target – maintenance of price stability, the regulator also responds to exchange rate fluctuations, thereby trying to reduce the impact of the exchange rate volatility on economic activity indicators and correlating the contribution of exchange rate changes to inflation.

The analysis of the coefficients at output for all options with the target instruments of both REPO and the monetary base revealed that the regulator did not seek to support output, and it was obvious that the regulator could not have impact on output in the current state of the economy. It is known that the slowdown in GDP growth in the period under review in the Russian economy is of a structural nature. Monetary policy cannot solve structural problems.

The monetary base or the real exchange rate had the greatest influence on the actions of the Central Bank on interest rate management, while inflation had little influence.

The exchange rate had greater impact on the actions of the regulator for the monetary base management, while inflation again had little impact.

The volatility of the interest rate turned out to be greater than the volatility of the monetary base. For example, the smoothing coefficient in the equation with a REPO rate is 0.847, while in the equation with the monetary base it is 0.984, although the difference is small.

Analysis of prognostic "forward-looking" options reveals that the coefficients at inflation and output become more significant both for a classical equation with a REPO rate, lag 3 and lag 6. The same cannot be said for a REPO option with the monetary base. In the option with the exchange rate, the weighting of the coefficients at inflation and output is reduced, and the coefficient at the exchange rate changes sign.

In the equation with the monetary base, the "forward-looking" option leads to a certain increase in the coefficient at inflation, a decrease in output and an invariance at the exchange rate.

Some relativity of such an analysis must be noted. The matter is that with the same set of instruments, some coefficients are statistically insignificant in t-statistics in the "forward-looking" option. The statistical significance of these coefficients can only be achieved with another set of instruments. As a rule, they should be increased. Conclusions about the advantage of "forward-looking" options can only be made after assessing the predictive quality of the equations.

5. Conclusion

It is believed that in the past decade and a half, the central task of the Central Bank in monetary policy had been regulation of the exchange rate while consistently ensuring the stability of monetary circulation. Drobyshevskiy S.M. et al., according to the results of the analysis of 1999-2007, believed [2] that the Bank of Russia gradually began to take more measures aimed at the classical ultimate goals of monetary policy – inflation and economic growth – at

the same time. The results of the assessment conducted by the authors (in the period 2003-2015) revealed that attention to such goals as inflation and economic growth was low. At the same time, it must be noted that the VAR method allowed to identify (Salmanov O. N *et al.*, 2016) that the channels of the monetary transmission operated with varying degrees of efficiency in the Russian economy, as evidenced by the assessment of the magnitude of the coefficients of intermediate goals in the monetary policy rule in this article. Besides, the VAR method used in the article by Salmanov O. N. *et al.* (2017) established the differences in the Bank of Russia economic policy in the period before and after the financial crisis of 2008. The current article did not aim to establish differences in the regulator's policy using the GMM method, although they obviously exist.

This paper estimating of the regulator's responses to various models over 2003-2015. The first was for the classical Taylor rule, the second was with the addition of the monetary base as an intermediate goal, the third was for an open economy with the inclusion of the exchange rate, and the fourth was for the open economy model with a goal in the form of the monetary base. Besides, all of these options for predictive indicators were assessed as "forward-looking". The level of values of the established coefficients was analyzed. The results of the interest rate assessment over time were provided for target inflation, along with the estimates for the "forward-looking" case, including for various lags.

Valuation of the smoothing coefficients in Drobyshevskiy *et al.* (2009) is at the level of 0.6 and shows the low inertia of intermediate goals, which the authors explain by the high variability of the domestic financial market.

When working with the ex-post data of eurozone member states, Sauer and Sturm (2007) estimated the coefficients ρ=0.94 for the period from January 1999 to October 2003; (Gerdesmeier and Roffia, 2004) estimated the smoothing coefficient as ρ=0.84 for the Eurozone; (Gorter and Haan, 2008) set the coefficient ρ=0.95 for the ex-post data for the period 1997M1 – 2006M12; when estimating the Taylor rule for the euro area consisting of the first twelve members for the 1999M1 to 2007M6, Belke and Klose (2009) set the smoothing coefficient for ex-post data for a simple model as 0.88, for the forward-looking model as 0.83; (Klose, 2011) estimated the smoothing coefficient as 0.92 for 16 OECD countries which were Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom and the USA, according to data from 1975 to 2010.

The results of our assessment indicate the sufficiently high coefficients of lagged intermediate targets of 0.85-0.9, which is at the level of developed countries and could be explained by a decrease in volatility during this time. Our results are in line with the results of the evaluation of other emerging economies – Brazil and India. In Brazil, the estimate of the inertia coefficient by Silva *et al.* (2016) is set within the range of 0.97-0.98. The authors explain such a value of the coefficient as the slower response of the monetary authority.

The empirical results of Honsy (2014) also indicate a significant smoothing of interest rates by the Central Bank of Egypt - the smoothing factor value of 0.61 for the period 2002M1-2012M12 and 0.91 for the period 2005M7-2012M12.

According to Anand *et al.* (2014) estimates, India observes a high degree of smoothing the interest rates (the coefficient is 0.8), which agrees with the estimates of this parameter by Madhusudan and Klau (2004) and Peiris *et al.* (2010).

Since 2015, the policy of the Bank of Russia has changed to a real inflation targeting, the monetary authorities have achieved a reduction in inflation and created the preconditions for the growth of output in the long term. The choice of the efficient monetary policy is an important measure to stimulate economic growth, but it does not substitute for structural transformations.

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