Assessing the Effectiveness of Monetary Policy of Central Banks

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ABSTRACT

Monitoring the effectiveness of the monetary policy of central banks is a crucial factor in the strategic management of the monetary sphere, not only at the national but also at the global level of the economy. Therefore, improving the methodological tools for this monitoring is of both scientific and practical interest, which determines the **relevance** of the research topic. The study **aims** to develop methodological tools to conduct a quantitative and qualitative assessment of the effectiveness of the monetary policy of central banks. The work uses a targeted **approach** to determining the effectiveness of the monetary policy, as well as **methods** of systemic-structural, comparative economic and GAP analysis. The empirical analysis of the effectiveness of the monetary policy in several countries for the period of 2014–2019 relies on the data of the World Bank and the Bank of Russia. **The novelty of the study** is in the targeted approach to the analysis and assessment of effectiveness. This approach is based on the specific features of strategic management of monetary circulation, which allows for a comprehensive objective assessment of the effectiveness regardless of the variety of strategic objectives of monetary policy and their development mechanisms in different countries. The study **resulted** in the methodology for quantitative assessment of monetary policy effectiveness and the criteria for qualitative evaluation of the analyzed effectiveness. The authors made **conclusions** regarding changes in the effectiveness of monetary policy in different countries, identified trends in the effectiveness of the monetary policy of the Bank of Russia, and revealed imbalances in its effectiveness at the level of federal districts. The results of the study confirmed the applicability and practical significance of the developed tools for analyzing and assessing the effectiveness of the monetary policy of central banks. By their means, international and national organizations will manage to identify best practices to implement monetary policy and recommend them for countries with low effectiveness of strategic management of monetary circulation.

Keywords: monetary policy; price stability; inflation targeting; effectiveness; monetary circulation; strategic management

INTRODUCTION

Monetary policy by central banks has long been a very important research topic. Most of them aim at creating theories of monetary policy, models or algorithms for central banks.

Today, there are several basic theories that establish the objectives of monetary policy and methods to achieve these goals. For example, [1, 2] provide a review of these theories. There about 10 main theories and their modifications. The analysis of these theories indicates their weaknesses, as well as fundamental problems that call into question the fundamental possibility of applying these theories in practice. These problems include:

1. A limited set of monetary policy models. There are only two main dependent variables in the models: the value of the money supply and the market rate. In the first case, the central bank monitors the volume of money supply in circulation and maintains it at the planned level. The interest rate here is based on market mechanisms that ensure a balance between the demand and supply of money. Alternatively, the target is the interest rate, and the money supply is at a level ensuring equilibrium in the money market for a given rate. Thus, the choice of one of the two dependent variables, in fact, comes down to the choice of the style of money management between directive and indirect.

2. Problems with the exchange rate targeting are due to the fact that the rates of national currencies depend on the monetary policies of other countries. Therefore, targeting exchange rates leads to the fact that the country's monetary policy falls under the influence of monetary policy and the economy of other countries and can harm national interests.

3. Difficulties with planning the required volume of money supply with directive control of its value. First, it is quite difficult to predict the velocity of money circulation. Second, it is difficult to calculate the future volume of transactions that should serve money circulation. Third, in the modern economy, a significant portion of money circulates in the financial sector, which creates additional demand for money. This sector is dynamic and poorly forecasted.

4. Problems with determining the target interest rate are as follows. First, the formulas for setting interest rate targets are very complex, especially their modern options. Second, the structure of interest rates is diverse, while the formulas specify only one of the rates. Third, the central bank can issue loans at a rate different from the key one. It follows that the recommendations for rate targeting are far enough from practical use. Decisions on the level of rates are actually made by central banks not by formulas, but by voting depending on side effects.

5. Problems with inflation targeting. The main problem in the practical implementation of this monetary policy regime is that overall inflation is the sum of two factors. The first is monetary inflation, which can be controlled by the central bank. The second factor is non-monetary inflation, which is outside the central bank's area of responsibility and is not fully controlled by the instruments it has. Thus, with a change in the money supply, non-monetary inflation will, to some extent, compensate for monetary inflation, making the results of inflation targeting policy unpredictable.

The considered problems of the practical implementation of management models in monetary circulation indicate that implementing monetary policy based on certain theoretical approaches is unreliable regarding the result. One should develop a methodological toolkit to measure the effectiveness of monetary policy both in quantitative and qualitative aspects. This was the motivation for the present study.

The research includes several sections. The first section reviews publications dealing with theoretical and methodological aspects of the problem. The second section describes the developed indicators and criteria for analyzing and assessing the effectiveness of

monetary policy of central banks. The third section applies the developed methodological tools to the analysis and assessment of the effectiveness of monetary policy in some countries of the world, including the Russian Federation. The last section contains the main findings.

LITERATURE REVIEW

Systematization and generalization of scientific and special literature on the research topic show the three main directions of analysis and assessment of the effectiveness of monetary policy.

The first direction determines the effectiveness of a monetary policy by its influence on the country's economy. Effective monetary policy is believed to lead to economic growth and development, lower unemployment, slower inflation, and increased economic and financial stability.

E. Alaoui et al. [3] investigated the effectiveness of monetary policy in terms of the relationship between monetary policy variables and macroeconomic variables and found that these relationships have heterogeneous trends at different time scales. They concluded that the effectiveness of Islamic monetary policy depends more on the amount of money, and not on the interest rate. Similar conclusions were made by L. Fan, Y. Yu and C. Zhang [4]. The authors found that the money supply has a great influence on future inflation rates and real output, while official interest rates do not influence these factors.

Fujiwara [5] conducted a study of the effect of zero nominal interest rate on the structural output gap in Japan. The results of this study showed that excessive easing of monetary policy can lead to a structural gap in output.

M. Bluhm analyzed the strategies of the Bundesbank [6] and concluded that, a distinctive feature of the Bundesbank's strategy since 1975 has been its focus on the growth of monetary aggregates, as well as real economic activity and inflation dynamics.

Summarizing the results of scientific research in this area, we note that they have a number of controversial points.

First, the concept of the effectiveness of monetary policy is replaced by the concept of the effectiveness of economic policy.

Second, the state of the economy is influenced by many non- monetary factors. It is difficult to separate this influence.

Third, the impact of monetary policy on macroeconomic indicators can be multidirectional. For example, the implementation of a stimulating monetary policy can have a positive effect on employment and economic growth, but a negative one on inflation and the state of the balance of payments.

Fourth, sensitivity of macroeconomic indicators to changes in monetary policy is not unambiguous. This is supported by various, sometimes contradictory, findings from scientific research.

According to the second direction, the effectiveness of monetary policy shows up in the high conductivity of the transmission mechanism channels [7–9] and the effectiveness of individual monetary instruments.

For example, the Bank of Russia identifies the following channels of the transmission mechanism: interest rate, credit, balance sheet, currency and information (inflation expectations channel) as the most significant, as well as the channel of welfare, cash flows and risk taking as less significant.[1] The authors of scientific publications (for example, [10, 11]) limit the assessment of the effectiveness of the monetary policy of the Bank of Russia to the analysis of one or several channels, without the complete examination of the transmission mechanism. In particular, E. S. Fedorovskaya and D. V. Burakov [10] estimated the conductivity

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[1] Guidelines for the Single State Monetary Policy for 2020–2022. Bank of Russia. 2019. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf (accessed on 10.11.2020).

of the credit channel of the monetary policy transmission mechanism of the Bank of Russia using the vector autoregression model. Based on the results, the authors formulated recommendations for improving the effectiveness of monetary policy in Russia as a whole. A similar study was conducted by E. S. Fedorovskaya [12] for the percentage channel.

The issues of conducting the transmission mechanism channels are described in the publications by foreign authors. M. Hossain and W. F. Ibon [13] used an assessment of the conductance of various transmission channels to analyze the effectiveness of monetary policy in Bangladesh.

P. L. Siklosa and M. T. Bohlb [14] assessed the effectiveness of monetary policy in Germany by analyzing the impact of Bundesbank communications and interest rates on inflation, while E. D. Naiborhu [9] assessed the effectiveness of the credit channel of the transmission mechanism of monetary policy in Indonesia by simulating the growth of bank credit depending on monetary policy shocks.

M. Were et al. [7] assessed the effectiveness of monetary policy in Kenya based on modeling the interest rate and credit channels of the transmission mechanism. The authors assessed the transfer of momentum from interest rates to inflation and aggregate demand.

G. Lopez-Buenache [8] investigated the evolution of the transmission mechanism of monetary policy in the United States after the Great Recession by assessing the economy's sensitivity to monetary policy shocks.

The effectiveness of the impact of interest rates on inflation in South Africa was examined by A. Iddrisu and I. P. Alagidede [15]. The authors assessed the conductivity of the interest rate and credit channel of the transmission mechanism of monetary policy using a vector autoregression model.

The effectiveness of monetary policy through the effectiveness of monetary instruments is also represented in the works by both Russian and foreign authors. For instance, O. V. Gordyachkova and E. V. Romanova [16] investigated the impact of various instruments of monetary policy on inflation, M2 money supply and exchange rate.

Yu. V. Vsyakikh and M. A. Kochergin [11] assessed the effectiveness of monetary policy by finding a correlation between the key rate and inflation.

K. Primus [17] compared the effectiveness of direct and indirect instruments of monetary policy in Barbados, Jamaica, and Trinidad and Tobago. The author concluded that central banks in small open economies should consider using reserve requirements as an adjunct to interest rate policies to achieve their macroeconomic goals.

To sum up, we note that the effectiveness of one or more channels of the transmission mechanism means the effectiveness of the transmission mechanism itself, and not monetary policy as a whole. The correlation of the monetary instrument and the target of monetary policy implies the possibility of achieving the set goal using this instrument, but does not always mean that the goal will be achieved only through this instrument.

The third area of research is methods and tools for analyzing and assessing the effectiveness of monetary policy of central banks.

Within this direction S. E. Dubova and S. V. Kuznetsova [18] developed a methodology for quantitative and qualitative assessment of the effectiveness of monetary policy using direct and indirect calculation methods. The direct method is determining the integral indicator, calculated by the point-weighted method, based on the need, target and economic effectiveness of the monetary policy. The goals of monetary policy are linked to macroeconomic goals that reflect the needs of the economy, and the dynamics of macroeconomic indicators is considered as criteria for the effectiveness of monetary policy. An indirect way is to

assess the effectiveness of monetary policy through the ratio of goals achieved to unattained goals.

Yu. Yu. Platonov and A. A. Terekhova [19] assess the effectiveness of monetary policy using indicators of the dynamics of the exchange rate, consumer price index and money supply. A similar approach based on dynamics indicators is used by P. V. Antonov and O. O. Zlobin [20]. They propose to assess the effectiveness of the monetary system by calculating and analyzing the dynamics of the credit and bank multiplier, as well as the monetization coefficient.

A. Tikhonov and A. Levenkov [21] use deviations of the GDP output gap, inflation rates, current account balance as a percentage of GDP, the ratio of the M3 aggregate to GDP and the systemic risk index from their average values in assessing the effectiveness of monetary policy [21]. The authors recommend assessing the effectiveness of a monetary policy based on a complex indicator, which includes particular indicators, normalized based on their standard deviations.

C. Pattipeilohy et al. [22] propose to use three-month interest rates to analyze monetary policy, which have a significant effect on the profitability of financial instruments, inflation and the output gap.

Generalization and systematization of publications in this area allows us to make the following conclusions.

First, the analysis and assessment of the effectiveness of monetary policy is based on the use of integral performance indicators calculated by the point-weighted method, which introduces an element of subjectivity in the calculation results.

Second, the analysis of effectiveness is suggested based on the methods designed to analyze trends in macroeconomic indicators and their stability, which does not correspond to the methodology of strategic management of the monetary sphere.

In general, the analysis of publications within all these areas helps identify the following main shortcomings in assessing the effectiveness of monetary policy of central banks:

• identification of the goals of monetary policy with the goals of economic policy;

• replacement of the concept of effectiveness of monetary policy with the concepts of effectiveness of the transmission mechanism and the effectiveness of monetary instruments;

• lack of methodological tools for assessing the effectiveness of monetary policy from the standpoint of strategic management in monetary circulation, followed by central banks.

Therefore, this study aims to develop scientifically based and easy-to-use methodological tools to conduct a quantitative and qualitative assessment of the effectiveness of the monetary policy of central banks in the context of strategic management in monetary circulation.

RESEARCH METHODOLOGY

Unlike the definitions of business effectiveness, based mainly on the ratio of results and costs, the methodology for analyzing and assessing the effectiveness of monetary policy from the standpoint of strategic management in monetary circulation has a pronounced specificity. This specificity is due to the fact that policy is an element of management, and management effectiveness is the ability to create goals and mechanisms to achieve these goals. From this point of view, the use of the targeted approach makes the most sense comparing to approaches based on the dynamics of macroeconomic indicators or on the assessment of the effectiveness of individual channels and instruments of the transmission mechanism.

Applying the target approach involves selecting targets and establishing their target values for the future (as a rule, for the medium term), as well as comparing these target (planned) values with the actual level achieved.

Choosing targets for monetary policy is defining its regime. Currently, we define the following monetary policy regimes:

1. Inflation targeting aimed at price stability.[2] Here, the most important task is to select an inflation indicator and to determine its target level. Most countries use the consumer price index (CPI) as an inflation indicator, which includes the prices of a wide range of goods and services. The choice of this indicator as a target is due to the fact that, although the base consumer price index is less volatile and more susceptible to the influence of monetary policy measures, the consumer price index better characterizes the change in the cost of living, and its dynamics affects the formation of inflationary expectations of economic entities.

2. Exchange rate targeting implies stabilization of the national currency rate in relation to the currencies of other countries. The exchange rate of the national currency is supported by means of foreign exchange interventions by the central bank to achieve a certain price ratio in the domestic and foreign markets [23].

3. Money targeting means setting medium-term goals in the form of monetary aggregate values. It is acceptable in the case of a high proportion of monetary components in the structure of factors of economic and financial development of the state [24].

4. Nominal GDP targeting based on indicators of real GDP and inflation [25]. The main advantage of this regime is the ability to monitor macroeconomic indicators and the implementation of monetary policy according to the results of economic monitoring. Under the nominal GDP targeting, monetary policy should be consolidated with other types of economic policy to ensure economic growth.

5. Targeting credit implies establishing a target value of the volume of credit or an increase in the total mass of credit resources [26, 27].

6. Interest rate targeting means maintaining money market rates at a given level [28].

7. Targeting without an explicit nominal anchor [29] means that central banks, along with monetary ones, apply other regimes, for example, targeting employment, economic growth, etc.[3]

Today's most popular monetary policy regime is inflation targeting. It is used in 41 countries, accounting for more than a third of global GDP. It is used by the central banks of Australia, Brazil, Great Britain, Russia, Japan, and others. Moreover, the Eurozone and the United States, which have not officially introduced inflation targeting, also set medium-term inflation targets. Including them, the share of countries setting target values for inflation reaches 75% of global GDP.[4]

Due to the variety of regimes and goals of monetary policy, we propose the following developed models to determine its effectiveness:

$$E = 1 - \sqrt{\frac{Z_1^2 + Z_2^2 + ... + Z_n^2}{n}} , \qquad (1)$$

where: E is the index of the effectiveness of monetary policy;

Z is the indicator of deviation of the actual values of the target monetary policy indicator from its planned values, calculated for each target indicator by formula (2);

n is the number of monetary policy targets.

$$Z = \frac{F - P}{\max(P, \beta)} , \qquad (2)$$

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[2] Central Bank of the Russian Federation. URL: https://cbr.ru/DKP/ (accessed on 10.11.2020).

[3] Statement on Longer-Run Goals and Monetary Policy Strategy. The Federal Reserve System. 2020. URL: https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm (accessed on 25.10.2020).

[4] Guidelines for the Single State Monetary Policy for 2020–2022. Bank of Russia. 2019. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf (accessed on 10.11.2020).

where: F is the actual value of the monetary policy target indicator, %;

P is the planned value of the monetary policy target indicator, %;

β is the minimum value of target indicator P, determined by the measurement accuracy, %.

In models (1), (2), Z index can be either positive or negative. The sign of the indicator depends on the direction of the deviation. With no deviations $Z = 0$. Indicator E with no deviations from the plan is equal to 1, and it decreases with deviations. In theory, with large deviations from the plan, E can become less than zero, although in practice this situation looks anomalous. The square root is subtracted from one so that the highest effectiveness was 1, and the lowest one was 0.

In formula (2), β is used to adjust the target indicators whose target value is close or equal to zero. Since the planned value (P) of the target indicator (Z) is located in the denominator of formula (2), its value close or equal to zero will lead to an excessively strong influence of corresponding indicator Z on overall index E. It is better to use the measurement error as β indicator of the corresponding monetary policy target.

The scope of application of proposed models (1), (2) is limited by official quantitatively expressed goals of monetary policy. The quantitative expression of goals should be pointwise.

However, in fact, different options are used to quantify the objectives of monetary policy:
• specific (point) target value;
• target point with a range of permissible deviations;
• target range.

For example, the point value of the inflation target is set by the central banks of Great Britain — 2%, Sweden — 2%, Japan — 2%. To emphasize the impossibility to achieve a goal with high precision, some inflation targeting central banks choose a point with a tolerance range or a target range as the type of goal. In this case, the range of acceptable values reaches (±2 pp), and the target range is within ±4 pp.[5] For instance, a specific inflation target value with a range of acceptable deviations is used by the central banks of Russia (4±1.5)%, Canada (2±1)%, Turkey (5±2)%, India (4±2)%, Brazil (4.5±2)%. The target range is used by the central banks of Israel (1–3)%, Australia (2–3)%, South Africa (3–6)%, Jamaica (4–6)%.

Regarding establishing inflation targets as a target range, there arises a problem to choose a point value of inflation. This problem can be solved by using the midpoint of the range as the target point value.

Proposed models (1), (2) provide for only a quantitative assessment of the effectiveness of monetary policy. To obtain a qualitative characteristic of effectiveness, we have developed a special rating scale (*Table 1*).

The rating scale (*Table 1*) has five options for qualitative characteristics of the effectiveness of monetary policy: high, good, satisfactory, low, ineffective, as well as criteria that allow the quantitative assessment of the effectiveness of monetary policy to be attributed to a particular qualitative level. The ranges of qualitative characteristics were created by dividing the maximum value of the quantitative assessment of the effectiveness of monetary policy ($E = 100\%$) into 4 equal parts.

RESULTS

The developed methodological toolkit was used to assess the effectiveness of monetary policy in developing (Russia, India, Brazil, Turkey) and developed (Sweden, Canada, Great Britain and Japan) countries[6] for 2014–2019. *Appendices 1* and *2* provide the initial data for calculating the effectiveness of the monetary

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[5] Guidelines for the Single State Monetary Policy for 2018–2020. Bank of Russia. 2018. URL: https://www.cbr.ru/Content/Document/File/48129 /on_2018(2019–2020).pdf (accessed on 10.11.2020); Guidelines for the Single State Monetary Policy for 2014–2016. Bank of Russia. 2013. URL: http://www.cbr.ru/content/document/file/87373/on_2014(2015–2016).pdf. (accessed on 10.11.2020); Guidelines for the Single State Monetary Policy for 2015–2017. Bank of Russia. 2015. URL: http://www.cbr.ru/content/document/file/87372/on_2015(2016–2017).pdf (accessed on 10.11.2020).

[6] IMF. URL: https://www.imf.org/external/index.htm (accessed on 25.10.2020).

Scale of qualitative assessment of the effectiveness of monetary policy

Effectiveness levels of monetary policy	Criteria for the effectiveness of monetary policy, %
High	$75 < E \leqslant 100$
Good	$50 < E \leqslant 75$
Satisfactory	$25 < E \leqslant 50$
Low	$0 < E \leqslant 25$
Ineffective	$E \leqslant 0$

Source: compiled by the authors.

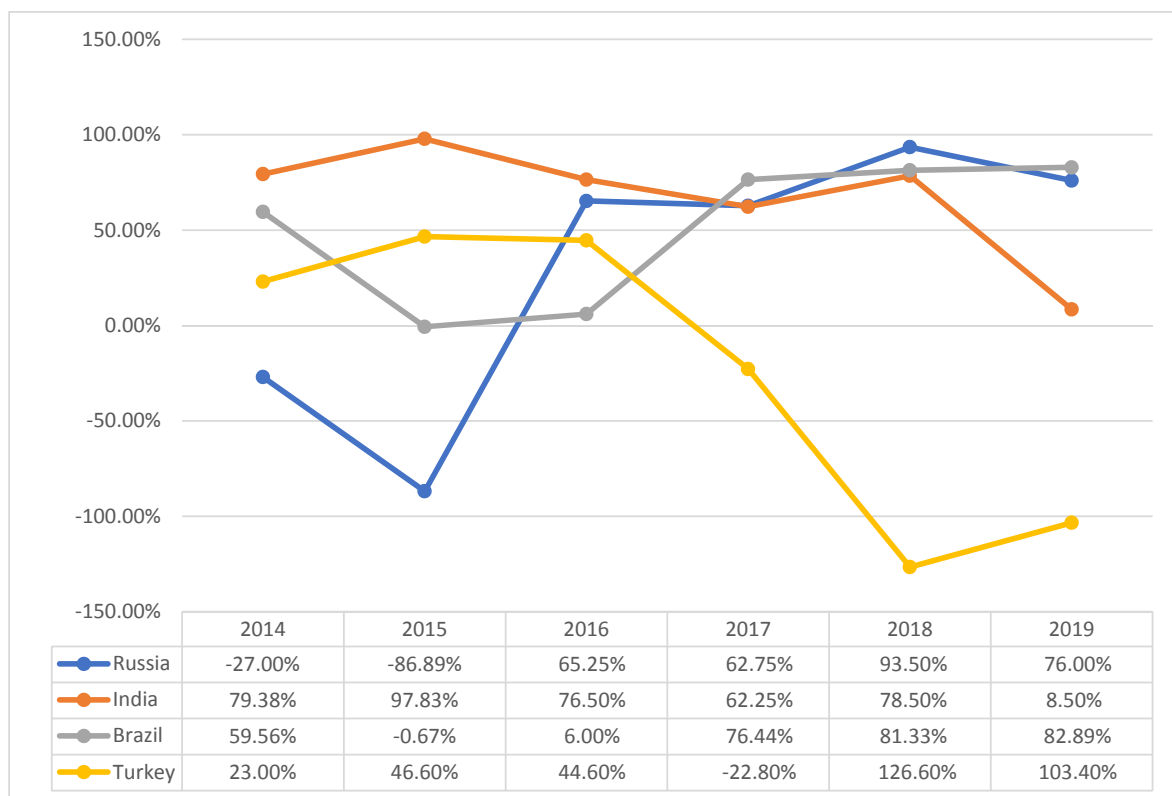|	2014	2015	2016	2017	2018	2019
Russia	-27.00%	-86.89%	65.25%	62.75%	93.50%	76.00%
India	79.38%	97.83%	76.50%	62.25%	78.50%	8.50%
Brazil	59.56%	-0.67%	6.00%	76.44%	81.33%	82.89%
Turkey	23.00%	46.60%	44.60%	-22.80%	126.60%	103.40%

Fig. 1. **Effectiveness of the monetary policy in Russia, India, Brazil and Turkey in 2014–2019**
Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

policy of these countries. The countries were chosen by the presence of quantitatively expressed goals in the monetary policy of their central banks. The analysis period was determined by the availability of the data used in the calculations. The calculation of the effectiveness of monetary policy was carried out using models (1), (2). β index was conventionally taken for 1.0%.

Fig. 1 shows the dynamics of the index of the effectiveness of monetary policy in developing countries.

Fig. 1 shows a decrease in the effectiveness of monetary policy in Russia and Brazil in

Table 2

Qualitative assessment of the effectiveness of the monetary policy in Russia, India, Brazil and Turkey in 2014–2019

	Russia	India	Brazil	Turkey
2014	Ineffective	High	Good	Low
2015	Ineffective	High	Ineffective	Satisfactory
2016	Good	High	Low	Satisfactory
2017	Good	Good	High	Ineffective
2018	High	High	High	Ineffective
2019	High	Low	High	Ineffective

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020 (2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

2015, caused by the fall in energy prices and the devaluation of the national currency. Later, as the negative influence of external factors decreased and the decisions of central banks on stabilizing prices were implemented, the effectiveness of monetary policy in these countries began to increase and reached a high level by the end of the period *(Table 2)*.

India and Turkey showed the opposite dynamics. In India, the effectiveness index remained at a good and high level until 2019. This is due to the fact that in 2014, India just started to make the transition to the inflation targeting regime and outlined realistic targets to achieve the inflation target: 8% for 2014, 6% for 2015 and 4% for 2016.[7] A flexible approach to monetary policy goals made it possible to keep inflation close to the established target values. However, in 2019, the Bank of India's monetary policy effectiveness index dropped to 8.5%. This was due to heavy rains that destroyed a significant part of the crop. The weather conditions provoked a sharp rise

in retail prices, which could not be held by monetary instruments.

In Turkey, the effectiveness index of monetary policy was low throughout the analyzed period. Due to a sharp decline in 2016, it went into the negative zone. The effectiveness index reached its minimum value in 2018. The maximum deviation of the actual inflation values from the target level took place in October 2018 (about 20 p.p.). The reasons for the significant acceleration of inflation in 2018 were both external and internal factors. In particular, in August 2018, there was a sharp weakening of the lira (in 2018, its exchange rate fell by 40%) amid the trade conflict with the United States and capital outflow from emerging markets.

Fig. 2 shows the dynamics of the effectiveness index of monetary policy in developed countries.

The graphical analysis (*Fig. 2*) shows a decline in the effectiveness of monetary policy in 2015, followed by its recovery in Canada, the United Kingdom and Japan. The low effectiveness of monetary policy in these countries was associated not with high inflation, as in developing countries, but, on

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[7] Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework. Reserve Bank of India. 2014. URL: https://www.rbi.org.in/Scripts/PublicationReportDetails. aspx? UrlPage=&ID=743 (accessed on 10.11.2020).
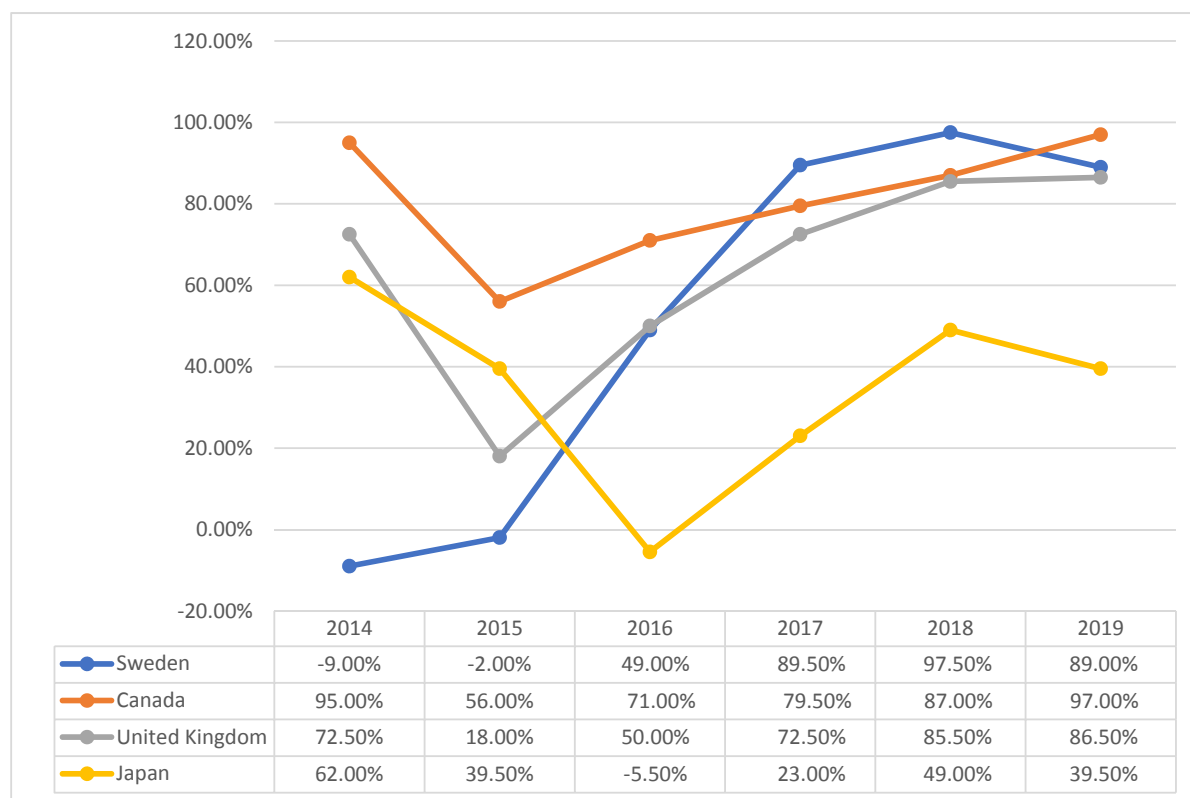
Fig. 2. **Effectiveness of the monetary policy in Sweden, Canada, the UK and Japan in 2014–2019**

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

Table 3

**Qualitative assessment of the effectiveness
of the monetary policy in Sweden, Canada, Great Britain and Japan in 2014–2019**

	Sweden	Canada	UK	Japan
2014	Ineffective	High	Good	Good
2015	Ineffective	Good	Low	Satisfactory
2016	Satisfactory	Good	Satisfactory	Ineffective
2017	High	High	Good	Low
2018	High	High	High	Satisfactory
2019	High	High	High	Satisfactory

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

Table 4

Territorial differentiation of the effectiveness of the monetary policy of the Bank of Russia in 2019

Indicator	Central Federal District	Northwestern Federal District	Southern Federal District	North Caucasian Federal District	Volga Federal District	Ural Federal District	Siberian Federal District	Far Eastern Federal District
Inflation target	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actual inflation	3.0	3.0	2.7	3.2	2.7	3.1	3.6	3.9
Monetary policy effectiveness index	0.75	0.75	0.68	0.80	0.68	0.78	0.90	0.98
Monetary policy effectiveness level	Good	Good	Good	High	Good	High	High	High

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020 (2021–2022).pdf (accessed on 10.11.2020).

the contrary, with excessively low growth rates of consumer prices and even deflation. For example, in Japan, inflation remained below 1% from 2015 to 2019, with a target of 2%. Against the general background, there is a steady growth in the Bank of Sweden's monetary policy effectiveness index, which, from negative values at the beginning of the analyzed period, managed to reach a high level in 2017. The effectiveness of the Bank of Japan's monetary policy, on the contrary, decreased from "Good" in 2014 to "Low" in 2017 (*Table 3*). In subsequent years, the Bank of Japan's monetary policy effectiveness index began to rise slowly, but in 2019 it did not manage to reach the 2014 level.

The comparative analysis of the effectiveness of monetary policy in developed and developing countries shows that the best results in 2019 were achieved by Canada — 97.0%, Sweden — 89.0%, Great Britain — 86.5%, Brazil — 82, 89%, and Russia — 76.0%. These indicators demonstrate the best practices in implementing monetary policy, therefore,

they require careful consideration with a view to further replication in countries with a low level of effectiveness of strategic management in monetary circulation.

Thus, the proposed methodological toolkit, designed to analyze and evaluate the effectiveness of monetary policy in different countries, can be used for the same purposes within countries in the context of their territorial entities. Applying these tools to the analysis of the effectiveness of the monetary policy of the Bank of Russia in the context of federal districts made it possible to identify territorial imbalances in achievement of inflation targets (*Table 4*).

Table 4 shows that in 2019, the Far Eastern Federal District achieved the best effectiveness indicators of monetary policy. This was facilitated by government measures aimed at developing the economy of this district. The implementation of government support measures led to an increase in lending activity in the real sector of the economy and an increase in effective demand

for goods and services at a faster pace than in other districts.

Less significant results were shown by the Southern and Volga Federal Districts. Despite the fact that the effectiveness of monetary policy in these districts was good, an increase in the monetary policy effectiveness index there would make it possible to raise the effectiveness of the monetary policy of the Bank of Russia on a national scale.

CONCLUSIONS

Monitoring the effectiveness of monetary policy of central banks plays an important role in the strategic management in monetary circulation. Improving the assessment of the effectiveness of monetary policy is of both scientific and practical interest. However, the analysis of scientific research revealed the lack of methodological tools that would allow assessing the effectiveness of monetary policy from the standpoint of strategic management of the monetary sphere, which is followed by central banks.

In this regard, the study aimed to develop scientifically grounded and easy-to-use methodological tools to conduct an objective quantitative and qualitative characteristic of the effectiveness of monetary policy of central banks in the context of strategic management in monetary circulation.

We developed a method for quantifying the effectiveness of the monetary policy based on the calculation of the effectiveness index. The effectiveness index is an integral indicator that includes private effectiveness indices corresponding to individual monetary policy objectives. We also developed criteria for a qualitative assessment of the effectiveness of

the monetary policy of central banks, which make it possible to group countries and their territorial entities by levels of effectiveness. Thus, the study develops the theory and methodology of the effectiveness of management systems when choosing criteria and methods for the overall assessment of the effectiveness of monetary management.

The novelty of the study is in the targeted approach to the analysis and assessment of effectiveness of monetary policy of central banks, corresponding to the methodology of strategic management in monetary circulation. This approach involves selecting targets and establishing their future target values, as well as comparing these target (planned) values with the actually achieved level. This approach makes it possible to obtain a comprehensive objective assessment of effectiveness, regardless of the variety of strategic goals of monetary policy and their development mechanisms in different countries.

Based on a targeted approach, the methodological toolkit is objective, since it relies on official data from central banks, international financial organizations and statistics bodies in the public domain. For the same reason, it becomes available for analytical use by a wide range of stakeholders.

In general, the results of the empirical study confirmed the applicability of the developed tools for analyzing and assessing the effectiveness of monetary policy of central banks. If used at the global and national levels of monetary management, it will allow for identifying the best practices in implementing monetary policy and recommending them in countries with low effectiveness of strategic monetary management.

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Source data for calculating the monetary policy effectiveness in developing countries

Russian Federation		
Year	Inflation target, %	Actual inflation, %
2014	5.00	11.35
2015	4.50	12.91
2016	4.00	5.39
2017	4.00	2.51
2018	4.00	4.26
2019	4.00	3.04
India		
Year	Inflation target, %	Actual inflation, %
2014	8.00	6.35
2015	6.00	5.87
2016	4.00	4.94
2017	4.00	2.49
2018	4.00	4.86
2019	4.00	7.66
Brasil		
Year	Inflation target, %	Actual inflation, %
2014	4.50	6.32
2015	4.50	9.03
2016	4.50	8.73
2017	4.50	3.44
2018	4.50	3.66
2019	4.50	3.73
Turkey		
Year	Inflation target, %	Actual inflation, %
2014	5.00	8.85
2015	5.00	7.67
2016	5.00	7.77
2017	5.00	11.14
2018	5.00	16.33
2019	5.00	15.17

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

Source data for calculating the monetary policy effectiveness in developed countries

Sweden		
Year	Inflation target, %	Actual inflation, %
2014	2.00	−0.18
2015	2.00	−0.04
2016	2.00	0.98
2017	2.00	1.79
2018	2.00	1.95
2019	2.00	1.78
Canada		
Year	Inflation target, %	Actual inflation, %
2014	2.00	1.90
2015	2.00	1.12
2016	2.00	1.42
2017	2.00	1.59
2018	2.00	2.26
2019	2.00	1.94
UK		
Year	Inflation target, %	Actual inflation, %
2014	2.00	1.45
2015	2.00	0.36
2016	2.00	1.00
2017	2.00	2.55
2018	2.00	2.29
2019	2.00	1.73
Japan		
Year	Inflation target, %	Actual inflation, %
2014	2.00	2.76
2015	2.00	0.79
2016	2.00	−0.11
2017	2.00	0.46
2018	2.00	0.98
2019	2.00	0.79

Source: compiled by the authors based on data from the Bank of Russia and the World Bank. URL: http://www.cbr.ru/content/document/file/87358/on_2020(2021–2022).pdf; https://www.worldbank.org/ (accessed on 10.11.2020).

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