

Monetary Policy Instruments of the Bank of Russia in the Interaction of Banking and Real Economy Sectors

Selivanova Kseniya Markovna and Ikhsanova Liliana Renatovna

Department of Banking, Institute of Management, Faculty of Economics and Financing,
Kazan Federal University, Kremliovskaya Str. 18, 420008 Kazan, Russian Federation

Abstract: Research of possible relations between different monetary policy instruments and financing of the real economy sector is conducted in the study, a role of banking sector in the transmission of impulses of monetary policy of the Bank of Russia using the method of correlation analysis based on the full data set of Russian banks for 2007-2015 years is evaluated. The most efficient monetary policy instruments of the Bank of Russia which are capable to influence the financing of the real economy sector are determined according to the research. Also, the branches of real economy sector which are funded to the great extent by monetary policy instruments providing long-term lending are found. The results obtained confirm the problem of insufficient long-term financing for the purposes of ensuring the development of real economy sector of the Russian Federation and also designates the sources of the problem.

Key words: Monetary policy rule, transmission mechanism of monetary policy, Russia, interaction between the banking and real sectors of the economy, correlation analysis

INTRODUCTION

Crisis in the economy raised new issues on the efficiency of monetary policy and its influence on the real economy sector. Data of the efficiency of transmission mechanism of monetary policy is the important reference point for central banks in their behavior policy (Vymyatrina, 2006). A mechanism of monetary policy can be different in each country depending on available instruments, stability of money demand and controllability of monetary aggregates that means one should speak about the unique combination of different factors affecting the mechanism of actions transmission of a central bank to the real economy sector of each country.

According to the Federal Law No.86-Φ3 dated July 10, 2002 "On the Central Bank of the Russian Federation (Bank of Russia)", the Central Bank of Russia in cooperation with the Government of the Russian Federation develops and carries out a unified state monetary policy. Monetary policy conducted by the Bank of Russia has two forms of impact (direct and indirect) on different economic processes in country. These forms corresponds to own set of instruments. In the modern context by developing a market-oriented approach for monetary policy implementation, the Bank of Russia uses a variety of indirect instruments: open-market operations,

lombard loans, deposit auctions, reserve requirements (Balino, 1998). Monetary policy of the Central Bank of the Russian Federation influences the behavior of commercial banks, affecting the resources volume of credit institutions. Central bank by using the various instruments of monetary policy should react to changes in inflation rate, falling-off in production and decrease of the exchange rate of a national currency consistently and predictably to the real economy sector ensuring timely and continuous financing of economy sectors.

A range of works were dedicated to the issues of efficiency of monetary policy of the Central Bank of the Russian Federation including the efficiency of monetary policy transmission mechanism. So, based on the full set of quarterly data for all Russian banks for the period 1999 -2007 years, the researches Juurikkala *et al.* (2011) found an evidence for the existence of the credit transmission channel of monetary policy in Russia. Other researches Esanov *et al.* (2005) show that during the period from 1993 till 2004 the Bank of Russia had been using the monetary aggregates as the main policy instrument. A character and degree of the impact of used monetary policy instruments for its purposes during crisis and pre-crisis periods are analyzed in the article by Lukasevich *et al.*, (2012). It was researched by Ono (2013) that shocks of the monetary policy which were determined

as a violation of money supply have a lasting effect on the real output and more than half of a volatility of the real output can be explained by the changes in money stock.

Assessment of the monetary policy efficiency of the Bank of Russia for the point of impact degree of monetary policy instruments on long-term interaction of banking and real economy sectors using correlation analysis method is being held within our research.

MATERIALS AND METHODS

Correlation analysis allows to find the degree and presence of dependency between the studied variables. Calculation formula of Pearson's correlation coefficient looks like this:

$$r_{xy} = \frac{\sum(x_i - \bar{x}) \times (y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x}) \times \sum(y_i - \bar{y}) \times (n-1)}}$$

Where:

x_i = A value of the variable x

y_i = A value of the variable y

\bar{x} = Arithmetic mean for the variable x

\bar{y} = Arithmetic mean for the variable y

Coefficient value is changing from -1 to 1 where a sign before the correlation coefficient means direct or inverse relationship between factors studied.

Degree of correlation ratio is determined with the help of Chaddock scale according to which correlation coefficients correspond to the following degrees of constraint force (in modulus):

- From 0.1-0.3 weak constraint force
- From 0.3-0.5 moderate constraint force
- From 0.5-0.7 outstanding constraint force
- From 0.7-0.9 high constraint force
- From 0.9-1 strong constraint force

On the basis of the identified degree of correlation ratio, one can judge the strength of interdependence of the parameters studied, make economic conclusions based on statistically proven calculations.

RESULTS AND DISCUSSION

We have constructed a data array from 2007 till 2015 years consisting of the following parameters:

- Loans to the real economy sector by maturity (up to 30 days from 30-90 days from 90-180 days from 180 days to a year from 1-3 years and >3 years)
- Loans to the real economy sector by industries
- Classic repo operations
- Overnight loans
- Lombard loans
- Intraday loans

- Other loans
- Refinancing rate, key interest rate
- Reserve requirements
- Swap operations

Source for statistical material is a data from the official web site of the Central Bank of the Russian Federation (Bank of Russia, 2014). Selection of parameters is due to the need to identify the ways of distribution of resources received by credit institutions.

Degrees of correlation (effectiveness) of monetary policy instruments and volumes of lending of the real economy sector by maturity were determined as a result of modeling (Table 1).

Correlation analysis of monetary policy instruments and volumes of lending of the real economy sector dependency showed that such instruments as classic repo, intraday and other loans (correlation coefficient >0.6) have the biggest influence with the resource market of the real economy sector. However, the dependency of monetary policy instruments and long-term financing kindle the greatest interest within our research. The same three instruments which have a high impact on all types of loans maturity can be noted. Average level of the dependency of long-term loans on a key interest rate of the Bank of Russia can be noted wherein long-term financing is the only type of financing, depending on this instrument. All other instruments have not been having a significant impact on the volumes of long-term lending of the economy, since 2007 to the present time.

In reviewing, the situation by a foreign exchange section (Appendix) the higher degree of monetary policy instruments influence on financing of the real economy sector in national currency is traced. Exchange rate fluctuations significantly affect the demand for money in Russia in spite of the dedollarization of the Russian economy (Korhonen and Mehrotra, 2010). Lending in foreign currency have the dependency on three instruments only classic repo operations, intraday and other loans and lending in roubles shows high values of correlation with almost all monetary policy instruments of the Bank of Russia. At the same time, the majority of instruments affects short and medium-term financing only. Long-term lending in national and foreign currency is supported by similar few instruments.

Accordingly, we have discovered the factors of dependency of long-term lending of the real economy sector and monetary policy of the Bank of Russia classic repo operations, intraday and other loans.

Let's determine the industries of the real economy sector of Russia which are financed by the factors selected for the purposes of research with the help of correlation analysis (Table 2).

Cash funds accepted by credit institutions on selected instruments of the Bank of Russia are directed

Table 1: Correlation analysis of monetary policy instruments and volumes of lending of the real economy sector dependency

Parameteres	To 30 days	From 31-90 days	From 91-180 days	From 181 days to 1 year	From 1-3 years	>3 years
Repo	0.76	0.73	0.78	0.75	0.82	0.80
Overnight loans	-0.17	-0.07	-0.10	0.03	-0.10	-0.13
Lombard loans	-0.55	-0.54	-0.43	-0.13	-0.21	-0.30
Intraday loans	0.74	0.55	0.62	0.61	0.89	0.88
Other loans	0.68	0.41	0.55	0.60	0.69	0.78
Refinancing rate/key interest rate	-0.44	-0.34	-0.28	-0.09	-0.57	-0.61
Reserve requirements on liabilities to non-resident banks	0.49	0.46	0.48	0.28	0.19	0.22
Reserve requirements on liabilities to individuals	0.68	0.58	0.56	0.33	0.36	0.43
Reserve requirements other liabilities	0.65	0.58	0.54	0.30	0.27	0.35
Total volume of FX swap operations	0.48	0.51	0.45	0.44	0.47	0.41
FX swap USD/RUB	0.40	0.44	0.41	0.37	0.36	0.32
FX swap EUR/RUB	0.43	0.43	0.36	0.40	0.45	0.39

Table 2: Correlation analysis of monetary policy instruments and volumes of lending of the real economy sector dependency by industries

Parameters	Repo	Intraday loans	Other loans
Mining operations	0.628284	0.767200	0.636203
Manufacturing	0.568177	0.657848	0.538046
Production and distribution of electric power, gas and water	0.470653	0.559448	0.344280
Agriculture, hunting and forestry	0.392777	0.489494	0.205034
Construction	0.642287	0.703697	0.392286
Transport and communication	0.509190	0.597035	0.313937
Wholesale and retail trade; repair of motor vehicles, motorcycles, household goods and personal items	0.685334	0.740617	0.542318
Operations with real estate, renting and business activities	0.604307	0.697600	0.428055
Other activities	0.306950	0.461738	0.238759
Total	0.597734	0.688479	0.458798

mainly to construction, wholesale and retail trade and mining operations. Other industries of the real economy sector have a lesser degree of dependency on these instruments. Funds coming to a bank through repo operations and intraday loans are also directed to such industries as manufacturing and operations with real estate however influence degree is much lower. Volume of long-term resources in the agriculture of commercial banks in Russia is least of all dependent on the investigated parameters. That means long-term resources long-term resources from the most effective instruments of monetary policy of the Bank of Russia did not reach the industry which has a most need of them.

Summary: Thus, the most efficient monetary policy instruments of the Bank of Russia which are able to affect the financing of the real economy sector are determined. These include classic repo operations, intraday and other loans. All other instruments have either a less sphere of influence on the money supply in economics or do not have it at all. Among the branches which are financed to the maximum extent at the expense of instruments that ensure a long-term lending, construction, wholesale and retail trade and mining operations can be distinguished (Ekaterina *et al.*, 2014). At the same time, agriculture is determined as a branch that does not have the dependency on any of the instruments researched. Received results confirm only the problem of development of the real economy sector of the Russian Federation a lack of long-term financing and also indicate the sources of this problem a low degree of monetary policy instruments influence on the interaction in chains “Central Bank real economy sector”, “Bank real economy sector”.

Further research will be aimed on the detection of instruments which are able to impact the activity of commercial banks regarding the increase of long-term financing level of all branches of the national economy.

CONCLUSION

- Dependency factors of long-term lending of the real economy sector and monetary policy of the Bank of Russia are classic repo operations, intraday and other loans
- Impact of monetary policy instruments on financing of the real economy sectors in national currency is higher in relation to the corresponding impact of foreign currency
- Cash funds accepted by credit institutions from the Bank of Russia are directed mainly to construction, wholesale and retail trade and mining operations
- Volume of long-term resources of commercial banks of Russia directed to agriculture is least of all dependent on funds coming into the banking sector from the Bank of Russia

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APPENDIXES

Appendix a: Correlation analysis of monetary policy instruments and loans for the real economy sector dependency in roubles

Parameters	To 30 days	From 31-90 days	From 91-180 days	From 181 days to 1 year	From 1-3 years	>3 years
Repo	0.71	0.71	0.79	0.75	0.81	0.82
Overnight loans	-0.21	-0.10	-0.13	0.00	-0.14	-0.14
Lombard loans	-0.60	-0.57	-0.50	-0.19	-0.27	-0.32
Intraday loans	0.64	0.55	0.67	0.62	0.90	0.88
Other loans	0.52	0.39	0.54	0.67	0.61	0.72
Refinancing rate/key interest rate	-0.48	-0.35	-0.39	-0.12	-0.63	-0.66
Reserve requirements on liabilities to non-resident banks	0.58	0.51	0.51	0.33	0.28	0.25
Reserve requirements on liabilities to individuals	0.75	0.64	0.61	0.40	0.43	0.45
Reserve requirements other liabilities	0.72	0.64	0.58	0.37	0.34	0.37
Total volume of FX swap operations	0.52	0.50	0.48	0.43	0.47	0.46
FX swap USD/RUB	0.41	0.41	0.42	0.37	0.36	0.36
FX swap EUR/RUB	0.49	0.46	0.41	0.36	0.47	0.44

Appendix b: Correlation analysis of monetary policy instruments and loans for the real economy sector dependency in foreign currency

Parameters	To 30 days	From 31-90 days	From 91-180 days	From 181 days to 1 year	From 1-3 years	>3 years
Repo	0.62	0.54	0.32	0.45	0.58	0.74
Overnight loans	-0.03	0.04	0.12	0.17	0.14	-0.09
Lombard loans	-0.26	-0.25	0.15	0.20	0.16	-0.26
Intraday loans	0.70	0.34	0.09	0.36	0.56	0.85
Other loans	0.79	0.31	0.31	0.08	0.82	0.85
Refinancing rate/key interest rate	-0.23	-0.19	0.38	0.09	-0.11	-0.48
Reserve requirements on liabilities to non-resident banks	0.14	0.15	0.11	-0.05	-0.27	0.17
Reserve requirements on liabilities to individuals	0.33	0.23	0.05	-0.12	-0.09	0.36
Reserve requirements other liabilities	0.29	0.22	0.06	-0.15	-0.14	0.29
Total volume of FX swap operations	0.24	0.34	0.09	0.34	0.27	0.30
FX swap USD/RUB	0.23	0.37	0.17	0.21	0.23	0.23
FX swap EUR/RUB	0.17	0.19	-0.03	0.42	0.22	0.28

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