



Bank of Russia



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BANK OF RUSSIA AGENDA FOR ECONOMIC RESEARCH IN 2023–2025

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CONTENTS

1. Monetary Economics and Monetary Policy.....	4
1.1. Structural transformation and monetary policy.....	4
1.2. Inflation and inflation expectations.....	4
1.3. Monetary and fiscal policy interactions.....	5
1.4. Analysis of monetary policy communication.....	5
2. Financial Sector Development and Prudential Policy.....	7
2.1. Financial sector, financial assets and liabilities of other sectors amid its structural transformation.....	7
2.2. Maintenance of financial stability and banking supervision.....	7
3. New Challenges for Economy and Bank of Russia Policy.....	9
3.1. Central bank digital currencies.....	9
3.2. Decentralised finance (DeFi) and digital assets.....	9
3.3. Green finance and financing of energy transition.....	9
3.4. Development and implementation of artificial intelligence, machine learning, and big data analysis.....	10
4. Statistical Research.....	11
5. Methodological Studies.....	12
5.1. Assessment of regulatory effects and effectiveness.....	12
5.2. Modelling in the context of structural shifts and short data histories.....	12
Appendix.....	13

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12 Neglinnaya Street, Moscow, 107016 Russia
Bank of Russia website: www.cbr.ru

Dear colleagues:



Economic research is an essential part of the Bank of Russia’s work that helps us navigate through complex economic situations, see the bigger picture, better evaluate the outcomes of our policies, and move forward. The more challenging the situation we face, the greater the role research plays. It serves as our fog lamp, helping us make our way through uncertainty.

Another integral function of our research is communication with the market and the research community. We publish [articles](#) written by our researchers, hold seminars, and publish the [Russian Journal of Money and Finance](#). This helps us foster a broader framework for research and discussion on topics related to our activities. We will continue to develop this area.

In an environment marked by significantly reduced possibilities for interaction with the global academic community, the need for internal scientific discussions is only growing. In these circumstances, it is important to remain committed to the highest international academic standards, which implies both the use of the most advanced methods and the thorough verification of the results obtained.

Bank of Russia agenda for economic research in the near future take these factors into account. The range of topics includes both those of interest to many central banks and those that are specific to Russia.

We are publishing this document with the expectation of generating broad interest in conducting research on its topics. We look forward to the support of the academic community in finding answers to questions that are relevant to the Russian economy and the financial sector. The Bank of Russia welcomes research conducted by academic staff, postgraduates and undergraduate students, and it is open to discussing their results at research seminars and conferences.

This document includes more than just research on financial and economic issues. We put a high priority on statistical and methodological research which is aimed at finding, developing, and improving data and methods of working with data for economic research.

I hope that the agenda for economic research will prove useful to you, and I wish researchers success in their work.

Elvira Nabiullina
Governor of the Bank of Russia

1. MONETARY ECONOMICS AND MONETARY POLICY¹

1.1. Structural transformation and monetary policy

The global economy has entered a period of structural transformation due to the COVID-19 pandemic, rapid technological advancements, intensified climate policies, and geopolitical changes. In Russia, these processes have overlapped with the impact of restrictions on external trade and finance, with particularly pronounced effects.

This raises questions about the nature, depth, and duration of the structural changes in the Russian economy, as well as their consequences for inflation, the transmission of monetary policy, and the effectiveness of the existing monetary policy tools in maintaining inflation near 4% under any scenario.

The answers to these questions require the refinement of the existing macroeconomic models and the development of new ones, including statistical, semi-structural, agent-based, and general equilibrium structural models.

The main goal of our research is to understand the optimal policy of the Bank of Russia in view of these structural changes, particularly in terms of the optimal response to changes in relative prices.

Currently, the priority objectives include modelling potential GDP and the structural changes in the Russian economy, including taking into account cross-sectoral and interregional relationships. Studying the opportunities for and the constraints on the transformation of the labour and capital markets and assessing the prospects for productivity growth play an important role in this regard.

A key issue is to understand the changes in the transmission of monetary policy amid the distortions and imperfections in the financial market, including those related to external financial and trade restrictions. Under the new conditions, the modelling of commodity and financial flows within the balance of payments, the examination of the issue of financial ‘dollarisation’, and the analysis of the potential risks arising from the mismatch between the currency structure of assets and liabilities are of particular relevance.

One important area of research is the study of the factors driving household and corporate demand for loans and of structural changes in lending trends. The longitudinal survey of household finances conducted by the Bank of Russia and the data of the register of corporate loans make it possible to study these issues.

Another important aspect is the study of regional heterogeneity and its influence on the dynamics of inflation and macroeconomic indicators at the national level in view of interregional linkages.

1.2. Inflation and inflation expectations

In the face of the major price shocks in recent years and the traditionally important role of volatile components in overall inflation in the country, it is crucial to understand how this affects the anchoring of inflation expectations. Further empirical and theoretical research on the properties of inflation expectations and their role in decision-making by economic agents is therefore a top priority.

The key questions include:

- What factors drive inflation expectations?
- How can the anchoring of expectations be measured, including based on social media data?
- What is the role of inflation expectations in consumption and saving decisions?

¹ In addition to economic research, the Bank of Russia conducts analytical work, much of which is applied in nature and covers a broader range of areas and topics than research.

– Whose inflation expectations – those of companies, households, or financial institutions – are more important for inflation dynamics?

The household and business surveys conducted by the Bank of Russia may play an important role in answering these questions.

Better understanding of inflation dynamics involves the refinement of the methods for decomposing inflation into temporary and persistent supply and demand factors. The key question is to determine the role of monetary factors in the inflation process.

Another important area is the study of the impact of changes in the composition of the consumer basket on inflation trends in view of the structural shifts in consumption in recent years.

1.3. Monetary and fiscal policy interactions

The structural transformation of the national economy is accompanied by changes in the parameters of fiscal policy. It is crucial to understand how potential changes in the long-term structural budget deficit or surplus may affect inflation.

An important area of research is the study of the conditions that help avoid ‘fiscal dominance’ (a situation in which monetary policy decisions are subordinated to the needs of fiscal policy at the expense of price stability). This requires coordination between monetary and fiscal policies that allows the central bank to efficiently ensure price stability.

The inflationary effects of various types of budget spending and their financing sources are not sufficiently explored in the academic literature. More detailed/granular modelling of the structure of fiscal flows is needed to address this gap.

Research on the optimal design of fiscal rules and their impact on macroeconomic indicators, including the transmission of monetary policy, also has potential.

1.4. Analysis of monetary policy communication

The study of the monetary policy communication capabilities of the Bank of Russia is necessary to improve the understanding of the transmission mechanism of monetary policy. This will help enhance economic agents’ confidence in the policy pursued, anchor inflation expectations, and ultimately achieve the inflation target. Studies of the effects of communication on the interest rate curve and the analysis of the efficiency of communication based on big data and natural language processing (NLP) methods are of particular interest.

Priority topics in Monetary Economics and Monetary Policy²

- Modelling of potential GDP and the structural changes in the Russian economy in view of the macroeconomic shocks of 2020–2022*
 - Study of the volatility of macroeconomic indicators and the transmission of monetary policy under external restrictions and structural transformation*
 - Assessment of the macroeconomic effects of trade imbalances in national currencies*
 - Consumer and saving behaviour of households amid the recent macroeconomic shocks*
 - Study of the properties of inflation expectations in Russia*
 - Study of the influence of inflation expectations on inflation and decision-making by economic agents*
 - Inflation risks of budget deficits and the optimal monetary policy response*
 - Monetary policy communication: new opportunities for analysis using big data*
 - Accounting for the heterogeneity of economic agents in general equilibrium models: influence on monetary policy recommendations*
 - Modelling of core inflation indicators*
 - Accounting for regional heterogeneity in monetary policy decisions*
 - Optimal monetary policy in the context of the structural transformation of the economy
 - Triggers of ‘fiscal dominance’ and optimal coordination between monetary and fiscal policies
 - Structural changes in the economy: implications for the labour market and income inequality
- Classification codes according to the Journal of Economic Literature (JEL): E2, E3, E4, E5, E6.

² Topics marked with an asterisk (*) indicate ongoing or planned work at the Bank of Russia in 2023–2025.

2. FINANCIAL SECTOR DEVELOPMENT AND PRUDENTIAL POLICY

2.1. Financial sector, financial assets and liabilities of other sectors amid its structural transformation

The study of the optimal structure of the financial sector in terms of financial intermediaries and the flows, assets, and liabilities of various economic sectors has become particularly relevant under the new conditions in view of the macroeconomic shocks and the changing role of the external sector in recent years. This involves the examination of the structure of household and corporate assets and liabilities, as well as the factors influencing their preferences regarding the size and structure of these assets and liabilities.

Exploring pathways for the development of the financial sector is a priority. This will help enhance the availability of long-term financing (long-term money) for the real sector, given the potential risks for various economic sectors arising from the mismatch between asset liquidity and liabilities.

There is also great interest in examining the macroeconomic effects caused by changes in the structure of the financial system.

Research on the consumer risks of retail investors has become essential in view of the significant inflow of such investors to the equity market. This includes the study of their investment behaviour and the identification of their goals, expectations, and satisfaction with their actions in the investment market.

Research on financial inclusion and the development of financial literacy is also important in the context of the structural changes, with a particular focus on evaluating the accessibility of financial services for specific population groups and businesses,¹ as well as on studying the development and adaptation of various service channels, including the potential risks of the digital divide for certain consumer groups.

To identify prospects for the further development of financial literacy, it is important to study both the overall level and individual components, as well as the delayed effects of educational projects and programmes implemented.

Particular attention is given to behavioural assessment, which involves the study of the process of decision-making by financial consumers. This contributes to the development and improvement of behavioural regulation.

2.2. Maintenance of financial stability and banking supervision

The significant pressures faced by the Russian financial sector in recent years raise questions about the role played by the timely development of prudential policy tools and their efficient use for crisis management in order to minimise the impact of stress. In view of this, it is crucial to assess the effectiveness and consequences of the Bank of Russia's crisis management policies, and this forms the basis for the search for optimal policies to ensure financial stability.

The Bank of Russia is focused on improving its analytical tools in the significantly more uncertain environment. This is necessary, in particular, for the analysis of banking sector trends and stability, forecasting key banking sector indicators, evaluating trends and risks in specific segments of the credit market (including mortgage lending), and addressing other issues. To do so, models that

¹ These groups include: residents of remote, sparsely populated, and hard-to-reach areas; persons with disabilities, elderly people, and other low-mobility groups of population; low-income households; and small- and medium-sized enterprises.

enable the forecasting of loan defaults and models that allow for feedback effects between the real and financial sectors, including microdata-based network models, need to be improved. Such models are essential for calibrating micro- and macroprudential ratios and coefficients, as well as for stress testing.

An important research topic in the area of microprudential policy is the optimal application of universal international regulatory principles to a specific country. Priority research issues are also related to the study of the optimal regulation of small (regional) banks and ecosystems.

Essential research areas within the scope of the Bank of Russia's programme are modelling and assessing the efficiency and effectiveness of macroprudential measures. Specifically, the Bank of Russia is interested in evaluating the results of applying macroprudential limits in the area of unsecured retail lending. Another important topic is the study of the interaction between monetary, micro-, and macroprudential policies.

The Bank of Russia is focused on developing general equilibrium models with the financial sector and on monetary, micro-, and macroprudential policies. This allows 'laboratory' experiments to be conducted to analyse the effects of new macroprudential policy tools.

An unexplored area for research is the relationship between income inequality and macroprudential policy.

Priority topics in Financial Sector Development and Prudential Policy

- Optimal structure of the financial sector in the new environment and the elements of this structure*
- Assessment of the effects and effectiveness of regulatory easing for banks*
- Analysis of the role of specialised banking business models in the financial system*
- Modelling of systemic risks in construction and mortgage lending*
- Assessment of competition in the banking sector and its impact on pricing*. Assessment of the level of financial literacy of the population of the Russian Federation and the influence of financial literacy on financial behaviour*
- Evaluation of the long-term effectiveness of financial literacy projects and programmes*
- Behavioural assessment of financial consumers and research on the investment behaviour of retail investors as a basis for behavioural regulation*
- Calibration of capital requirements as part of economic capital models in view of the specifics of the Russian economy
- Optimal macroprudential policy
- Impact of macroprudential policy on inequality

JEL classification codes: G01, G1, G2, E4, E5.

3. NEW CHALLENGES FOR ECONOMY AND BANK OF RUSSIA POLICY

A number of global trends, primarily related to the development of information technology, automation, and climate change, pose new challenges to central banks. A number of these challenges already require regulatory decisions, in particular the determination of the role of central banks in climate initiatives and taking into account their implementation by other institutions in regulatory policies. Other challenges, such as the risks associated with the potential widespread use of artificial intelligence (AI) in finance, still need to be thought through. Although research in this area is hindered by the lack of historical data, it should help the Bank of Russia develop a strategy to proactively respond to these new challenges.

3.1. Central bank digital currencies

New digital technologies have created opportunities for the development of more advanced and user-friendly payment tools and systems, particularly for cross-border transactions. This includes central bank digital currencies (CBDCs).

The upcoming introduction of CBDCs by several central banks, including the Bank of Russia, highlights the importance of analysing the implications for the banking sector, monetary policy, and macroprudential policy. The use of CBDCs in international settlements may influence the dynamics of capital flows and the 'dollarisation' of the economy.

3.2. Decentralised finance (DeFi) and digital assets

The key questions in this area include:

- How does the development of DeFi affect financial markets and traditional financial intermediaries?
- Which market imperfections and associated risks arise as a result?

An important task is to understand the mechanisms for reaching consensus in decentralised systems and creating the right incentives for financial intermediaries and issuers of digital assets. The role and place of stablecoins in the modern financial system are also of interest to researchers.

The accelerated digitisation of financial products and services highlights the importance of studying its implications for the accessibility of financial services.

3.3. Green finance and financing of energy transition

For the central bank as a regulator of financial markets and an institution responsible for price and financial stability, an important area of research is the potential implications of and exposure to the climate transition and physical risks.

One important microeconomic question is the study of the incentives and strategies of companies, including the dynamics of their debt burden, in the context of climate transition risks. From a macroeconomic perspective, it is crucial to quantitatively assess the impact of the introduction of cross-border carbon taxes and external constraints on the energy transition (GDP, sectoral economic structure, and greenhouse gas emissions) in Russia, as well as the implications for financial stability.

It is also important to study the heterogeneity of banks in lending to companies actively pursuing climate agenda, to analyse the incentives of such banks and the current conditions for providing loans to such companies, and to design efficient mechanisms of green financing.

3.4. Development and implementation of artificial intelligence, machine learning, and big data analysis

In the context of the rapid development and increased application of AI methods based on machine learning and big data in finance, a key research area is to understand the limitations of these methods and the risks associated with their potential widespread use. Studies using machine learning methods to detect fraudulent schemes and financial pyramids have significant practical importance.

Priority topics in New Challenges for Economy and Bank of Russia Policy

- Effects of central bank digital currencies on the financial/banking sector*
- Efficient mechanisms of green financing*
- Impact of the introduction of the cross-border carbon tax and external constraints on the energy transition and macroeconomic indicators in Russia*
- Applications of development of DeFi for central bank policies
- Smart contracts: risks and opportunities for monetary policy and financial stability
- Debt burden of businesses in the context of climate transition risks
- Applications of the development and wider use of AI, machine learning, and big data methods in finance for central bank policies

JEL classification codes: G1, G2, E4, E5, O1, O2, Q5.

4. STATISTICAL RESEARCH

The preparation and use of new sources of information (including big data) to obtain timely assessments of the state of the economy and the financial sector is a priority for the Bank of Russia.

The regulator has also set a number of tasks in the field of improving data accessibility and the conditions for conducting research using Bank of Russia data.

Significant attention is directed to the improvement of methods for developing statistical metrics and indicators.

Priority topics in Statistical Research

- Development of a set of indicators that help monitor the economy at the industry, regional, and company levels based on granular and high-frequency data*
- Construction of analytical indicators in addition to official consumer price statistics
- Use of microdata for calculating debt burden indicators

JEL classification codes: C8, C55.

5. METHODOLOGICAL STUDIES

5.1. Assessment of regulatory effects and effectiveness

Methodological research plays a significant role in the Bank of Russia's strategy of widely implementing elements of evidence-based policy in decision-making in various areas. It aims to develop methods for assessing the actual effects of regulation and forecasting their future impacts. Assessing the effects involves identifying causal relationships between policy instruments and the target indicators of the regulator's policy, as well as other indicators (assessing side and spillover effects). To study the effectiveness of regulation, suitable criteria (quality metrics) need to be developed for regulation. The development of a methodology for evaluating the long-term effectiveness of financial literacy projects and programmes is also an important task.

5.2. Modelling in the context of structural shifts and short data histories

Structural shifts and relatively short data histories are challenges of modelling emerging market economies that researchers must face. This requires the estimation of the consequences of multiple events using knowledge of the economic structures and practices of other countries.

The development of a methodology for building quality metrics that can help at least indirectly assess the validity of various model assumptions under the conditions of insufficient information is another research task for the Bank of Russia.

Other important tasks include increasing the computational speed of existing models and using large-scale neural network linguistic models for research purposes.

Priority topics in Methodological Research

- Incorporation of knowledge of economic structure into non-structural models*
- Development of fast estimation methods for state space models*
- Development and improvement of methods for assessing regulatory effects and effectiveness
- Improvement of tools for solving and evaluating non-linear general equilibrium models
- Measurement of the quality of various methods for estimating the effectiveness of monetary and macroprudential policies

JEL classification codes: C1, C6, C8, C9.

APPENDIX

Summary report on the implementation of ‘Bank of Russia Agenda for economic research. June 2021’¹

PUBLICATIONS ON PRIORITY TOPICS IN THE SERIES OF ECONOMIC RESEARCH REPORTS (WORKING PAPERS) ON THE BANK OF RUSSIA WEBSITE, SELECTED REFEREED JOURNALS, AND OTHER SOURCES (JOURNALS OF OTHER CENTRAL BANKS)

Priority topics	Publications ²
Monetary policy	
Modelling of the effect of the transmission of Bank of Russia monetary policy to interest rates along the yield curve	<ul style="list-style-type: none"> – Abramov V., Tishin A., Styryn K. Monetary policy and the yield curve. 2022; – Grishina T., Ponomarenko A. Banks’ interest rate setting and transitions between liquidity surplus and deficit. 2021; – Ponomarenko A. 2022. ‘Money creation and banks’ interest rate setting’. Journal of Financial Economic Policy.
Assessment of the anchoring of inflation expectations using non-structural methods	<ul style="list-style-type: none"> – Evstigneeva A., Karpov D. The impact of negative news on public perception of inflation. 2023.
Study of the demand for payment services in Russia and the introduction of a central bank digital currency	<ul style="list-style-type: none"> – Grishchenko V., Ponomarenko A., Seleznev S. A feasible approach to projecting household demand for the digital ruble in Russia. 2023.
Assessment of banking sector fragmentation using granular credit register data	<ul style="list-style-type: none"> – Burova A., Ponomarenko A., Popova S., Sinyakov A., Ushakova Yu. Measuring heterogeneity in banks’ interest rate setting in Russia. 2021; – Burova A., Kozlovtsseva I., Sinyakov A. Corporate credit in Russia during COVID-19 pandemic: The role of credit lines. 2022; – Burova A., Ponomarenko A., Popova S., Sinyakov A., Ushakova Y. Measuring heterogeneity in banks’ interest rate setting in Russia. Emerging Markets Finance and Trade. 58 (14). 4103–4119. 2022.

¹ Bank of Russia Agenda for economic research. June 2021 [Направления экономических исследований в Банке России. Июнь 2021] – in Russian.

² If no source is specified, publications were posted on the Bank of Russia website in the series of economic research reports (working papers).

Financial stability and banking supervision	
Research on ex ante monetary and macroprudential policies to counter financial stability risks associated with excessive private sector debt accumulation	<ul style="list-style-type: none"> – Styryn K., Tishin A. Preventive monetary and macroprudential policy response to anticipated shocks to financial stability. 2021; – Bush G., Gómez, T., Jara A., Moreno D., Styryn K., Ushakova Y. Macroprudential policy and the inward transmission of monetary policy: The case of Chile, Mexico, and Russia. <i>Review of International Economics</i>. 29 (1). 37–60. 2021.
Quantitative assessment of the economic and financial stability implications of the introduction of the cross-border carbon tax and transitioning to a low-carbon economy in Russia	<ul style="list-style-type: none"> – Penikas H. The interrelation of credit and climate risks. 2022; – Burova A., Deryugina E., Ivanova N., Morozov M., Turdyeva N. Transmission to a low-carbon economy and its implications for financial stability in Russia. 2023.
Study of the phenomenon of ‘zombification’ in corporate lending	<ul style="list-style-type: none"> – Bessonova E., Popova S., Fedulova M. Distressed firms and loan guarantee programmes during the COVID-19 crisis. 2022; – Bessonova E. Firms’ efficiency, exits and government procurement contracts. <i>European Journal of Political Economy</i>. 102253. 2022; – Bessonova E., Popova S., Turdyeva N., Tsvetkova A. Productivity and lending during the pandemic. <i>Voprosy Ekonomiki</i>. (7):123–141. 2021 (in Russian); – Bessonova E., Myakisheva S., Tsvetkova A. Market exits during the pandemic. <i>Voprosy Ekonomiki</i>. (10):113–133. 2021 (in Russian); – Bessonova E., Movsesyan L., Tsvetkova A. Long-term financing, investment and innovation-related growth. 2021.
Study of the economic and theoretical reasons for the dollarisation of the Russian economy	<ul style="list-style-type: none"> – Burova A., Kozlovtseva I., Makhankova N., Morozov A. Dollarization, financial stability risks and monetary policy implementation: Exploring the nexus. <i>Ensayos Económicos</i>. 1 (77), 50–71. 2021; – Burova A., Egorov K., Mukhin D. Foreign currency debt and exchange rate pass-through. 2022; – Khabibullin R., Ponomarenko A. An empirical behavioral model of household’s deposit dollarization. <i>Journal of Economic Interaction and Coordination</i>. 17. 827–847. 2022.
Modelling of the effectiveness of macroprudential measures using simulated data	
Modelling of the effects of macroprudential regulation and the use of DFM models	<ul style="list-style-type: none"> – Penikas H. 2021. ‘Assessing the efficiency of Bank of Russia macroprudential policy aimed at limiting unsecured consumer lending using the modified difference-in-differences method’. – Kozlovtseva I., Penikas H., Petreneva E., Ushakova Y. Macroprudential policy efficiency in Russia: Assessment for the uncollateralized consumer loans. <i>Emerging Markets Review</i>. 100910. 2022.
Comprehensive evaluation of changes in the maturity structure of the corporate loan portfolio, credit risk, and dynamics of debt burden for enterprises	<ul style="list-style-type: none"> – Goncharenko R., Mamonov M., Ongena S., Popova S., Turdyeva N. Quo Vadis? Evidence on new firm-bank matching and firm performance following bad bank closures. 2021.

Statistical research	
Development of a set of indicators that help monitor the economy at the industry, regional, and company levels based on granular and high-frequency data (including national payment system data)	– Shevelev A., Buzanov G. Probability of default model using transactional data of Russian companies. 2022.
Calculation and publication of enterprise monitoring data disaggregated by major economic activities	
Construction of analytical indicators in addition to official consumer price statistics	– Kramkov V. Does CPI disaggregation improve inflation forecast accuracy? 2023; – Orlov D., Postnikov E. Labour market and inflation relationship indicator. 2022.
Use of microdata for calculating debt burden indicators	– Burova A., Koshelev D., and Makhankova N. 2022. ‘Debt service: Evidence based on consolidated statements of Russian companies’.
Development and timely updating of a database of time series of official statistical indicators considering their historical revisions (vintage data)	– Gornostaev D., Ponomarenko A., Seleznev S., Sterhova A. A real-time historical database of macroeconomic indicators for Russia. 2021.
Development of data arrays to complement datasets for evaluating the effects of monetary and macroprudential policies	
Development of data arrays as benchmarks for evaluating the quality of forecasting models	
Methodological studies	
Development of methods for identifying historically similar episodes (in terms of the nature of economic processes) between different countries	
Incorporation of knowledge of economic structure into non-structural models	
Measurement of the quality of various methods for estimating the effectiveness of monetary and macroprudential policies	– Deryugina E., Guseva M., and Ponomarenko A. 2022. ‘The credit cycle and measurement of the natural rate of interest’. <i>Journal of Central Banking Theory and Practice</i> , 1. Pp. 87–104.
Development of fast estimation methods for non-linear state space models	– Khabibullin R. and Seleznev S. 2022. ‘Fast estimation of Bayesian state space models using amortised simulation-based inference’.
Improvement of the tools for solving and evaluating non-linear general equilibrium models	– Andreyev M. and Polbin A. 2021. ‘Optimal simple monetary policy rules for a resource-rich economy and the Zero Lower Bound’. – Andreyev M. and Polbin A. 2022. ‘Monetary policy for a resource-rich economy and the Zero Lower Bound’. <i>Ekonomicheskaya Politika</i> , 17. No. 3. Pp. 1–30.

Other publications, including those in accordance with ‘Bank of Russia Agenda for Economic Research. June 2021’, in the series of economic research reports (working papers) on the Bank of Russia website and in selected refereed journals from 2021 to 2023

Publications in refereed journals

1. Andreyev M. Effectiveness of the stabilization fiscal rule for resource-rich countries. *Voprosy Ekonomiki*. (12):72–97. 2022 (in Russian).
2. Lymar M., Reentovich A., Sinyakov A. A commodity exporting economy under the ‘new reality’: Aggregate and structural changes. *Voprosy Ekonomiki*. (12):44–71. 2022 (in Russian).
3. Orlov D., Postnikov E. Phillips curve: Inflation and NAIRU in Russian regions. *Journal of the New Economic Association*. No. 3 (55), Pp. 61–80. 2022.
4. Penikas H. IRB Asset and Default Correlation: Rationale for the macroprudential mark-ups to the IRB risk-weights, *Risk Management*. 25 (1). 1–27. 2023.
5. Penikas H. PD-LGD correlation for the banking lending segment: Empirical evidence from Russia, *Model Assisted Statistics and Applications*. 17 (1). Pp. 27–39. 2022.
6. Penikas H., Skarednova A., Surkov M., Festa Y. Automation of the approach to replicating data when the control group is depleted in the difference-in-differences method: Application to IRB implementation data samples, *Procedia Computer Science*. 199. Pp. 231–237. 2022.
7. Grishchenko V., Tkachev V., Ostapenko V., Tunev, V. Modern Monetary Theory (MMT): New paradigm or a set of recommendations for macroeconomic policy? *Ekonomicheskaya Politika*. 16 (3): 8–43. 2021 (in Russian).
8. Demidova O., Karnaukhova E., Korshunov D., Myasnikov A., Seregina S. Asymmetric effects of monetary policy in Russia. *Voprosy Ekonomiki*. (6):77–102. 2021 (in Russian).
9. Penikas H. Premium for implicit deposit insurance within Russian state banks. *Voprosy Ekonomiki*. (10):89–112. 2021 (in Russian).
10. Semiturkin O., Shevelev A., Kvaktun M. Analysis of the heterogeneity factors and assessment of the structural levels of inflation in Russian regions. *Voprosy Ekonomiki*. (9):51–68. 2021 (in Russian).
11. Shubin I. Correlation between economic complexity and economic development in different types of Russian regions. *Journal of the New Economic Association*. No. 3 (51). Pp. 144–161. 2021 (in Russian).
12. Shulgin A., Shulgin S. Investments in the infrastructure of Siberia and the Far East. Macroeconomic analysis based on general equilibrium model. *Journal of the New Economic Association*. No. 1 (49). 81–114. 2021 (in Russian).
13. Bessonova E., Tsvetkova A. [Do productivity laggards ever catch up with leaders?](#) *Review of Income and Wealth*. 2021.
14. Borzykh D., Penikas H. IRB PD model accuracy validation in the presence of default correlation: a twin confidence interval approach. *Risk Management*. 23. 282–300. 2021.
15. Deryugina E., Ponomarenko A. Explaining the lead-lag pattern in the money-inflation relationship: a microsimulation approach. *Journal of Evolutionary Economics*. 31. 1113–1128. 2021.
16. Merika A., Negkakis I., Penikas H. Stress-testing and credit risk revisited: A shipping sector application. *International Journal of Banking, Accounting and Finance*. 4 (12). 347–367. 2021.
17. Nechitaylo V., Penikas H. Benchmarking banking regulation regimes. Application for the CBDC, *Model Assisted Statistics and Applications*. 4 (16). 261–272. 2021.

18. Penikas H. [Money multiplier under Basel capital ratio regulation: Implications for counter-COVID-19 stimulus](#). Journal of Sustainable Finance & Investment. 2021.

19. Zhemkov M. Nowcasting Russian GDP using forecast combination approach. International Economics. 168. 10–24. 2021.

Publications in the series of economic research reports (working papers) on the Bank of Russia website

1. Kramkov V. Does CPI disaggregation improve inflation forecast accuracy? 2023.

2. Andreyev M. Effects of the fiscal rule and model assumptions on the response of inflation in the aftermath of a terms-of-trade shock. 2022 (in Russian)

3. Karpov D. Russia's dependence on import of intermediate goods. 2022.

4. Manukhina Yu., Chetverikova E., Gudkova Yu., Vorontsova A. Heterogeneity in savings activity across Russian regions, its predictors, and determinants. 2022 (in Russian).

5. Evstigneeva A., Shchadilova Yu., Sidorovsky M. The role of communication and information factors in the emergence of surprises in Bank of Russia monetary policy. 2022 (in Russian).

6. Ostrovskaya E., Mamontov D. Regional convergence in Russia: Geographically weighted regression approach. 2022.

7. Babakin K. Heterogeneity of the impact of the ruble exchange rate on output in the regional context. 2022.

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