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RESEARCH ARTICLE

Digital Ruble: What Awaits Consumers of Financial Services?

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Abstract

The full implementation of the digital ruble as a means of payment in Russia, planned for mid-2025, has been postponed indefinitely. This decision creates, in particular, the opportunity to expand research into the potential impact of the digital ruble on the economy. One of the most pressing issues in the field of financial technologies is their impact on consumers of financial services. In connection with the above-mentioned, the purpose of the article is to identify the channels through which the introduction of the digital ruble can have the most significant impact on consumers of financial services. The quantitative study was carried out on the basis of descriptive and regression analysis to test statistical hypotheses. The work uses data from the Bank of Russia on deposit yields, zero-coupon yields, balances on current accounts, data from Frank RG on bank financing of loyalty programmes, as well as data from consolidated financial statements of companies. The article highlights the direct and indirect impact of the digital ruble on consumers of financial services. The direct impact is straightforwardly linked to the emergence of a new liquid payment instrument, cheaper than cashless payments, free of credit risks and available in mobile applications of commercial banks. At the same time, on the basis of the digital ruble, it is potentially possible to introduce additional functions, such as smart contracts. The introduction of digital ruble could lead to increased transparency of financial transactions and change the risk profile in the area of consumer security for financial services. The indirect impact of the digital ruble is associated with increased competition between commercial banks for private clients' funds. The article shows that such competition has intensified in recent years against the backdrop of the development of mobile banking, the introduction of fast payment systems and the emergence of financial marketplaces. An analysis of the specifics of such competition allows us to conclude that the introduction of the digital ruble encourages banks to expand loyalty programmes and cashback practices, and may also lead to increased misselling and unethical behaviour, which is important to consider within the framework of behavioural supervision. At the same time, based on a quantitative study, it was shown that competition between banks for funds from individual clients has historically not led to an increase in rates on short-term deposits of individuals. Thus, for deposits with a term of up to 90 days in 2012-2025, such rates were 2 percentage points lower than the yield on FLB

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(Federal Loan Bonds) and 3.6 percentage points lower than rates for non-financial organizations with similar maturity dates (all differences are significant at the 1% level), and as of 2021-2024, such differences in rates have not decreased. The article shows that the scenario of increasing rates on short-term deposits of individuals due to the introduction of the digital ruble is possible, but unlikely.

Keywords

bank deposits, misselling, central bank digital currencies, digital ruble

JEL codes: E42, E43, E58, G21, O16

Introduction

The purpose of the article is to identify the channels through which the introduction of the digital ruble can have the most significant impact on consumers of financial services. As of mid-2025, the digital ruble is being used in test mode, its full implementation has been postponed, but the main parameters of future circulation have already been outlined. The digital ruble is the third form of money within the national payment system of Russia; it can be exchanged with both cash and non-cash rubles in a 1:1 ratio.

The Bank of Russia has initiated discussions on various models for the issue and circulation of the digital ruble (Cifrovoj rubl': doklad dlya obshchestvennyh konsul'tacij… 2020; Koncepciya cifrovogo rublya… 2021). A number of models were considered, including a wholesale model and variations of the retail model. A two-tier retail model with the role of financial institutions as settlement participants was determined to be the most suitable: the Bank of Russia acts as a single issuer and accounting center[1], and access to the digital ruble is provided through the infrastructure of commercial banks. For owners of digital rubles, credit risks of commercial banks do not pose a threat, but the Bank of Russia does not plan to accrue interest on account balances in digital rubles, and therefore, in stable periods, their use as a means of saving and preserving value is impractical (Grishchenko et al. 2021).

The digital ruble has the potential for active use as a means of payment; according to several estimates, it could account for more than 40% of Russia's money turnover (Chapyshev and Shaidullin 2024). A number of initiatives suggest that in the future the digital ruble may actively enter retail circulation; in particular, it is planned to create infrastructure for paying for travel on public transport[2]. However, the process of introducing the digital ruble is lengthy and will require a restructuring of user experience and preferences (Yuj et al. 2024). According to a VCIOM poll on Russians' attitudes toward the digital ruble[3], conducted in 2023, over half of respondents (55%) "heard something about it", 30% were not aware of the introduction of the digital ruble in Russia, and only 15% knew about the planned mass introduction of the digital ruble in 2025. The majority of Russians (51%) have not yet

1 It should be noted that the digital ruble is not a cryptocurrency in the sense that it has a single issuer and accounting center.

2 Moskva i Bank Rossii zajmutsya razvitiem platformy cifrovogo rublya [Moscow and the Bank of Russia will develop a digital ruble platform]. URL: https://www.mos.ru/mayor/themes/12299/11276050/ [Accessed on 23.09.2024].

3 Vstrechaem «cifrovoj rubl'» [Meet the "Digital Ruble"]. VCIOM, 09.08.2023. URL: wciom.ru/analytical-reviews/analiticheskii-obzor/vstrechaem-cifrovoi-rubl [Accessed on 23.09.2024].

formed an understanding of the purpose of introducing the digital ruble. However, in general, the population has a positive attitude towards this initiative. Only 8% of respondents gave a negative assessment of the innovation, answering that the digital ruble is a "deception" (3%), "control" and "stupefaction of the population" (2% each), and "digital slavery" (1%). These statistics indicate problems in informing the population and the need to carry out work in this direction. The VCIOM poll[4] conducted in 2024, showed that citizens' interest in the digital ruble did not increase over the year. Despite the fact that about 68% of the population was aware of the planned introduction of the digital ruble, the majority of the population was not interested in the details.

The digital ruble is a central bank digital currency (hereinafter referred to as CBDC). Ideas for such digital currencies have been outlined in (Benes and Kumhof 2012; McLeay et al. 2014). As of 2022, more than 100 countries were developing and implementing CBDCs (Georgieva 2022). By 2024, more than 90% of central banks, representing about 98% of the global economy, have explored the possibility of introducing digital versions of their national currencies[5], with only a few central banks focusing on the wholesale model, while the development of the retail model, or both, has predominated (Di Iorio et al. 2024). As of 2024, most of the CBDC projects were at the research or pilot testing stage, and full-scale turnover was implemented only in isolated cases. There is already a negative experience of implementing the CBDC, which manifested itself, in particular, in the low interest of the population in digital currencies[6]. At the same time, based on low awareness, one cannot conclude that the widespread implementation of the CBDC is impossible, since in the modern digital environment, financial innovations can spread at high speed.

A number of studies have noted (Keister and Sanches 2019; Schilling et al. 2020; Grishchenko et al. 2021; Williamson 2022) that initially, central bank initiatives to issue and put into circulation CBDCs led to the formation of negative expectations and concerns among many market participants, in particular, in connection with threats to financial stability, a possible shortage of financial resources, or an increase in the cost of capital for commercial banks and the non-financial sector. Many works devoted to the CBDC and the analysis of the prospects and risks of their implementation have been published in the scientific literature. It has been shown that CBDCs can influence the macroeconomic situation both at the implementation stage and in the long term (Abad et al. 2023). CBDCs can contribute to increasing financial stability (Andolfatto 2020; Sakharov 2021; Penikas 2022). It is noted that the impact on financial stability may vary depending on the fact and principles of interest accrual on the CBDC (Anhert et al. 2023), and to achieve positive effects of the introduction of the CBDC, in particular on financial stability, it is necessary to correctly configure CBDC parameters (Keister and Monnet 2022).

The widespread use of CBDCs may lead to a reduction in the volume of deposits, but with the accompanying expansion of refinancing mechanisms, commercial banks will be provided with financial resources, and a decrease in lending to the real sector is not anticipated (Malloy et al. 2022; Abad et al. 2023). Moreover, some studies have shown that the introduction of CBDCs may even lead to an increase in lending and GDP in the long run (Chiu et al. 2023).

4 Cifrovoj rubl': za i protiv [Digital ruble: pros and cons]. VCIOM, 14.08.2024. URL: wciom.ru/analytical-reviews/analiticheskii-obzor/cifrovoi-rubl-za-i-protiv?ysclid=m21vxzqi1b441823804 [Accessed on 23.09.2024].

5 According to the Atlantic Council CBDC tracker. URL: https://cbdctracker.org/ [Accessed on 19.08.2025].

6 According to the resource Coinspaidmedia. URL: https://coinspaidmedia.com/ru/academy/how-different-countries-are-experimenting-with-cbdcs/ [Accessed on 24.09.2024].

Some studies have suggested that, thanks to technological advances, a single issuer of CBDCs can, at relatively low cost, keep track of all payment transactions (Ballivian and Tombini 2023) and ensure transparency of payment transactions (Flemming and Judson 2024). Launching the CBDC[7], central banks expect to receive such benefits as increased financial accessibility of payment services to the population, increased efficiency of the payment system, acceleration of the settlement process, reduction of negative environmental impact, transparency of transactions, control over the movement of funds, reduction of the volume of shadow transactions and increased security of the national payment system (Gorbacheva 2023; Larionov 2024). Consumers of financial services perceive forms of money differently (Sitnik 2023), and therefore the emergence of a new means of payment may influence their financial decisions. CBDCs have significant potential for use by consumers in everyday payment transactions, but the prospects for the adoption of CBDCs depend significantly on consumer demand for this form of payment (Engert et al. 2024). Demand for CBDCs as a means of payment can be observed among financial service consumers who do not trust banks and value reliability and confidentiality, while it is important to explain the features of CBDCs to financial service consumers (Bijlsma et al. 2021).

In general, the issues of digital currency circulation and their social consequences have been poorly studied in the scientific literature (Dyudikova and Kunitsyna 2024; Niepelt 2024). In this regard, this study aims to analyze the potential impact of the digital ruble on the position of consumers of financial services – individuals who are current or potential clients of financial institutions and have purchased or plan to purchase financial services and products not related to the commercial activities of these individuals. By the position of consumers of financial services, the authors mean the availability, diversity, cost and transparency of financial services, the stability of financial institutions, their customer focus and the threat of misselling on their part.

Methods

The research is based on the application of scientific methods such as analysis, synthesis, comparison. The article highlights the direct and indirect impact of the digital ruble on consumers of financial services. The direct effect is straightforwardly related to the fact of the emergence of a new payment instrument and manifests itself both in the impact on transaction costs and in changes in the transparency, security and risk profile of payment transactions (Barrdear and Kumhof 2016; Chen et al. 2022; Eisenbach et al. 2022; Grigoriev 2023; Niepelt 2024). Indirect effects are associated with the expected change in the level of competition among commercial banks for funds from individual clients, which will occur against the backdrop of the risks of loss of income by commercial banks when introducing the digital ruble (Grishchenko et al. 2021). In order to study the indirect effect, a set of expected reactions of commercial banks to the introduction of the digital ruble is analyzed. The authors admit that the digital ruble may have an impact on the position of consumers of financial services through other channels, but leave this outside the scope of this article.

Within the framework of quantitative research, descriptive analysis, statistical hypotheses test for the equality of means, and regression analysis are carried out. The article uses data

7 According to Coinspaidmedia. URL: https://cointelegraph.com/news/bis-cbdc-tokenization-projects-2024 [Accessed on 23.09.2024].

on deposit rates of individuals and organizations for various maturity periods (from "on demand" to 3 years), data on the zero-coupon yield of federal loan bonds (FLB), data on balances of individuals and organizations in current accounts and deposits. The observation period is from January 2012 to January 2025. The data have a time structure with monthly frequency. The study also used data on cash balances of public companies obtained from their consolidated financial statements.

Since statistics on deposit yields are available for maturity ranges (e.g. from 31 to 90 days, from 31 to 180 days, etc.), and statistics on the zero-coupon yield of FLB are available for specific maturity periods (0.25 years, 0.5 years, 1 year, etc.), then, to ensure comparability, the zero-coupon yield of FLBs was recalculated for periods based on a linear approximation.

$$YTM_{k1m} = \frac{YTM_{k1} + YTM_{k2} + YTM_{m1} + YTM_{k2}}{4},$$

where YTM_{k1m} is an average yield to maturity over the period from the term k before the deadline m, YTM_{k1} is a yield to maturity with maturity k at the beginning of the month, YTM_{k2} is a yield to maturity with maturity k at the end of the month, YTM_{m1} is a yield to maturity with maturity m at the beginning of the month, YTM_{m2} is a yield to maturity with maturity m at the end of the month.

The study included an analysis of changes in interest rates on deposits. Since the yield of each financial instrument depends on the average level of interest rates in the economy (Sharpe 1964; Lucas 1978), the work examined spreads, which is a conventional approach when studying interest rates (Boehm et al. 2021). The spread was calculated using the following formula:

$$spread_t = r_t - \tilde{r}_t,$$

where $spread_t$ is an interest rate spread, r_t is the interest rate, $\tilde{r}_t$ is the basis for calculating the spread, for example, the zero-coupon yield of FLB; all indicators are considered at the current moment in time, indicated by t. Tests of statistical significance of differences in the studied data were carried out on the basis of hypothesis testing:

- about the equality to zero of the mean value of a sample with unknown variance, the calculated t-statistics is equal to $t = \frac{\mu_1}{\sqrt{\frac{\sigma_1^2}{n}}}$, the number of degrees of freedom is equal to $n - 1$; here μ_1 is the estimation of the average value, σ_1^2 is the variance estimate, n is the sample size;
- on the equality of the means of two samples with unknown variances, the calculated t-statistics is equal to $t = \frac{\mu_1 - \mu_2}{\sqrt{\frac{\sigma_1^2}{n} + \frac{\sigma_2^2}{n}}}$, the number of degrees of freedom is equal to $n - 1$; here μ_1 and μ_2 are estimates of the average values of two samples, σ_1^2 and σ_2^2 are estimates of the variances of two samples, n is the sample size.

The critical value for the 1% significance level and 132 degrees of freedom is 2.6. When the calculated value t exceeds 2.6, it was concluded that there were significant differences.

Regression modeling was carried out based on the ARIMAX model for time series analysis, interest rate spreads were used as dependent variables, proxies for the general level of interest rates and dummy variables to account for time effects were used as explanatory variables.

The analysis of the dynamics of the volume of funds that commercial banks allocated to finance loyalty and customer reward programmes was carried out for the period 2016-2023 in both nominal and real terms, which made it possible to eliminate the impact of inflation on expense indicators. The base year was 2016. Banks' expenses in 2016 prices for customer remuneration in real terms were calculated as:

$$real\ spendings_t = \frac{nominal\ spending_t}{CPI_t},$$

where $nominal\ spending_t$ refers to expenses in nominal terms[8], CPI_t refers to cumulative price index from 2016 to the year t, $real\ spendings_t$ refers to expenses in real terms.

Results

Direct impact of the introduction of the digital ruble on consumers of financial services

The introduction of the digital ruble will directly affect consumers of financial services due to new opportunities for making payment transactions. After the test period is over, every Russian citizen, organization (including a bank or non-financial company) will be able to open one digital wallet, which will account for their digital rubles. The Bank of Russia will keep records of transactions and balances of digital rubles in all wallets, but access to them will be provided through the IT infrastructure of many commercial banks. In particular, if an individual has ruble current accounts in non-cash rubles in three banks, then in the mobile application of each bank there will be access both to the corresponding account and to a single digital wallet (see Fig. 1).

In connection with the above mentioned, digital rubles from the point of view of consumers of financial services will be partly similar to non-cash, but the operational convenience of using digital rubles will be the ability to access them through the mobile application of any bank, which in itself will increase the competitiveness of digital rubles relative to non-cash ones. Regardless of which bank's application a consumer of financial services uses, the mobile application will have access to a single wallet with digital rubles. At the same time, there will be no radical simplification of transfers between individuals due to the introduction of the digital ruble, since a fast payment system is already operating in this segment, within the framework of which the majority of transactions of individuals in non-cash rubles are carried out quickly and without commissions.

It is also possible to use digital rubles offline; an additional offline wallet is planned for this purpose (Koncepciya cifrovogo rublya… 2021). This innovation has limited prospects – only in areas without Internet access, where cash will pose significant competition to digital rubles.

The Bank of Russia announced that tariffs for transactions with the digital ruble will be lower than similar forms of payment in non-cash rubles[9]. In particular, transfers between individuals will be free, and fees for transfers from individuals to legal entities will in the future be 0.2-0.3% of the payment amount, which is significantly lower than the rates for acquiring, which can act as an analogue for payments from individuals to legal entities (Engert et al. 2024).

8 Data source: Trendy rynka reward-programm [Reward Programme Market Trends]. Frank RG (2024) URL: https://frankrg.com/wp-content/uploads/2024/04/f00443f4f461.pdf [Accessed on 23.09.2024].

9 Tarify na uslugi operatora platformy dlya pol'zovatelej platformy [Tariffs for platform operator services for platform users]. URL: https://cbr.ru/fintech/dr/doc_dr/tarif/dr_t-1 / [Accessed on 02.01.2025].

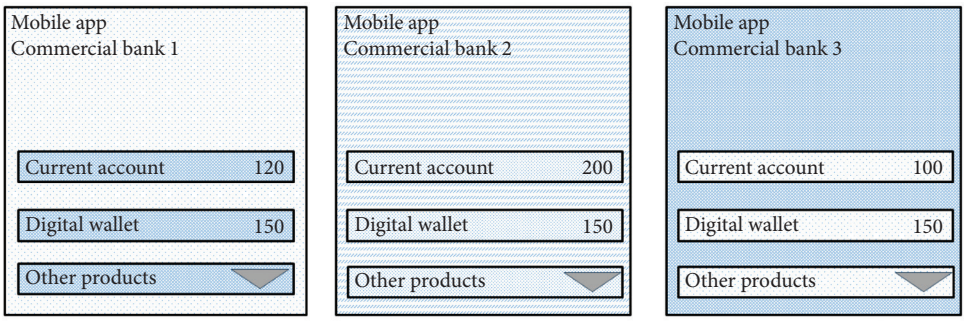

Figure 1. Illustration of access of financial services consumers to digital rubles in mobile banking applications. *Source:* compiled by the authors.

The introduction of the digital ruble as a new payment instrument could potentially provide consumers of financial services with broader functionality. In the digital ruble infrastructure, it is possible to create smart contracts that specify covenants for financial transactions and make automatic payments when criteria are met. First of all, this can be beneficial for the state and commercial companies – optimally structured smart contracts will reduce the state's costs for monitoring and treasury support of special accounts, and will also increase the efficiency of enterprises fulfilling the corresponding state order. When transferring subsidies, the Chief Administrator of Budgetary Funds can issue a smart contract and limit the possibility of further transfer of funds to counterparties located outside a certain contour. For companies, the use of smart contracts for settlements in digital rubles can become an alternative to such banking products as letters of credit and third-acceptance invoices. However, individuals will also be able to reduce risks by using the appropriate payment infrastructure of digital rubles using smart contracts, for example, when purchasing real estate on the secondary market.

Thus, digital rubles represent a new liquid instrument for consumers of financial services, which can be used as a means of payment with low transaction costs, as well as a store of value without credit risks. However, for consumers of financial services, transparency and security of payments are essential, and therefore it is important to analyze how the introduction of the digital ruble can affect:

- the transparency of transactions in digital rubles, access to information about such transactions by special departments and commercial organizations (banks and non-financial companies),
- the security of transactions in digital rubles, the risks of unauthorized data leaks, the risks of loss of funds, including as a result of cyberattacks and fraudulent actions.

A few studies note that the use of the CBDC will ensure the confidentiality of transactions, and the information will be available only to special agencies and participants in the transactions (Ballivian and Tombini 2023; Flemming and Judson 2024). In this context, it is important to consider issues of access to payment information by commercial banks, including those representing ecosystems. Such access could have negative consequences if it allowed the information to be used for future discrimination against buyers (Garratt and van Oordt 2021). On the other hand, access to purchase data may also have benefits, particularly if targeted information improves the utility of customers. These aspects of transparency need to be taken into account when determining the access regime for financial transaction

data by commercial banks (as well as the possibility of using this information, which is especially important in the context of the planned model, within which information on payments in digital rubles will be available through the IT infrastructure of commercial banks). One possible approach is to allow the consumer of financial services to decide whether to share data on purchases made with digital rubles with third parties.

Regarding access to information for special agencies, it should be noted that the digital ruble can best ensure transparency of transactions, as a result of which the use of funds obtained by criminal means will be significantly complicated, and the efficiency of security and anti-corruption agency employees in identifying threats to society will increase, since the costs of monitoring transactions in digital rubles will be minimal, and resources will appear for risk-oriented development of security threats.

The identification of the source of payment provides transparency for monitoring compliance with legal regulations and financial rules. When paying with digital rubles, all information about the payment fact is located in the Bank of Russia. By allocating targeted funds (for example, maternity capital or subsidies), the state monitors compliance with established rules for their spending. In the case of the digital ruble, the allocated funds can be "coloured" to eliminate the possibility of their misuse, and the transaction register will allow the entire ownership history to be established. Tracking non-cash money transfers is also quite simple, but the digital ruble is "coloured", which increases the effectiveness of control. In the modern world, almost any action leaves a "digital trace," and the circulation of the digital ruble fits organically into this paradigm. It should be noted that such increased transparency can both contribute to the fight against crime and the reduction of the shadow economy, and also negatively affect the freedoms and quality of life of citizens. Based on the conducted research, digital, non-cash and cash rubles can be compared in terms of transaction transparency (Table 1).

As can be seen from Table 1, digital rubles create new opportunities for consumers of financial services, but new risks associated with information protection and payment security are emerging. A number of studies have noted that ensuring security when organizing the circulation of digital currencies may be more expensive (Eisenbach et al. 2022; Niepelt 2024) than with non-cash payments. One of the main risks is the fact that the full-scale use of digital rubles could increase the vulnerability of the entire payment system to risks, as well as increase the risks of major data leaks.

Regarding issues of digital and financial literacy, it should be noted that the introduction of the digital ruble will most likely lead to the emergence of new forms of fraud. Overall, access to the digital ruble and its capabilities, as well as exposure to risks, will vary among financial services consumers depending on their level of financial literacy. In this regard, it is important to draw the conclusion that it is necessary to inform the population about the possibilities and risks of using digital rubles.

Overall, the analysis showed that, in the absence of technological failures, the direct effect of the introduction of the digital ruble for consumers of financial services can be assessed as positive, as they will gain access to a new convenient liquid payment instrument (Chen et al. 2022), which has no credit risks. However, the impact on the security and transparency of payment transactions is uneven. On the one hand, modern technologies make it possible to increase the security of payments and provide access to them by special authorities. On the other hand, in the context of the widespread use of the digital ruble, the consequences of the realization of risks become more significant due to the potential scale of financial losses and data leaks, as well as due to new practices on the part of fraudsters. Thus, with

Table 1. Comparison of payment instruments by transaction transparency

Comparison criterion	Digital rubles	Non-cash rubles	Cash rubles
Information on income/expense of funds	+	can be obtained through the bank that performs the payments	can only be obtained from additional documents
Intended purpose of the funds (so-called "colouring")	+	additional documents and labour costs are required for control	additional documents are required or cannot be implemented
Smart contracts	it is possible to implement	-	-
Withdrawal of funds	possible remotely	possible remotely with the participation of banks	physical search required
Authenticity of funds	+	+	a thorough check of the banknotes is required
Personal data	confidentiality depends on the effectiveness of information protection by the Bank of Russia, anonymity is not assumed	confidentiality depends on the effectiveness of information protection by banks, anonymity is not assumed	confidentiality and anonymity, except in cases of identity verification

Source: compiled by the authors

the full implementation of the digital ruble, one should expect a significant direct impact on consumers of financial services, and also take appropriate measures aimed at informing consumers of financial services and protecting them from fraudulent activities. However, the digital ruble may have an equally significant impact on consumers of financial services through an indirect impact associated with increased competition between commercial banks for funds from individual clients. The next part of the article is devoted to the analysis of such indirect influence.

Indirect impact of the introduction of the digital ruble on consumers of financial services through the impact on competition of commercial banks

Modern commercial banks offer a large number of products and services, and therefore competition between commercial banks can develop in various directions. In recent years, the banking system has undergone technological and infrastructural changes that have significantly altered the models of competition between banks and their struggle for customer funds:

- the emergence and spread of mobile banking,
- introduction and expansion of the fast payment system (FPS),
- the emergence of financial marketplaces.

Taken together, these phenomena have led to the fact that the transaction costs of individuals in searching for alternative offers and transferring their own funds to other banks

have been significantly reduced. This change is extremely significant for commercial banks, as banks risk losing access to the so-called "free liabilities" that generate 25-40% of the profits of commercial banks (Grishchenko et al. 2021).

A number of studies note that the introduction of the CBDC may significantly affect the level of competition in the banking sector (Sinelnikova-Muryleva 2021; Chiu et al. 2023; Ahnert et al. 2023). The introduction of the digital ruble will not only further reduce transaction costs associated with finding the best deals and transferring funds to other banks, but will also create an alternative way of storing money that is superior to non-cash money in terms of liquidity and absence of credit risks (Penikas 2021). Thus, the introduction of the digital ruble may significantly affect the financial performance of commercial banks and increase competition due to the risk of losing access to cheap liabilities. Also, a significant aspect may be the loss of income from conducting payment transactions.

Given the similar nature of the changes (reduction of transaction costs, risk of loss of income), it is appropriate to consider the forms in which competition between commercial banks has manifested itself in recent years against the backdrop of the spread of mobile banking, the introduction of FPS and the emergence of financial marketplaces. In recent years and as of 2025, the bulk of payments by individuals are made in non-cash rubles, which is why there are remaining funds in their bank accounts. On demand deposits, banks pay individuals a low yield (for example, in May 2024, only 5.13%, which is 11 percentage points lower than the key rate), and only on deposits with a maturity of more than 6 months do banks accrue interest comparable to the key rate and the yield on FLBs with corresponding maturity dates[10]. Thus, short-term funds of individuals represent cheap (in some cases, free) liabilities that banks, taking into account the formation of reserves, place at market interest rates, in particular, issue loans.

Non-financial companies also have account balances to perform treasury functions and maintain liquidity. However, the focus of companies on making a profit leads to them placing the bulk of their available funds in bank deposits. Based on the analysis of consolidated financial statements, it can be concluded that large public companies place 50% to 90% of their cash on short-term deposits, therefore, the remaining part represents "free" liabilities for banks[11]. Funds may be unallocated due to their receipt at the end of the payment day,

10 For example, for deposits with maturities from 181 days to 1 year, the average rate in May 2024 was 15.03%, which is less than 1 percentage point lower than the key rate and approximately 0.5 percentage points lower than the zero-coupon yield of FLB for the corresponding terms (calculated based on data from the Bank of Russia. URL: https://cbr.ru/statistics/bank_sector/int_rat/, https://cbr.ru/hd_base/zcyc_params/ [Accessed on 05.06.2024]).

11 According to the consolidated financial statements for 2020-2023, the balances of unplaced ruble funds amounted to about 5-20 billion rubles for PJSC MMC Norilsk Nickel and PJSC Severstal, 50-120 billion rubles for PJSC OC ROSNEFT, about 25 billion rubles for PJSC Surgutneftegas, about 20 billion rubles for Acron Group, and about 50 billion rubles for PJSC Magnit. The current accounts of 50-70 largest public companies may contain at least 1 trillion unplaced non-cash rubles daily. The analysis is limited because not all companies publish information on remaining balances in 2022-2023, and classifications also vary – a number of companies do not distinguish between current account funds and short-term deposits. References: PJSC OC ROSNEFT (URL: www.rosneft.ru/Investors/statements_and_presentations/Statements/?ysclid=lyll64ypb5478800408), PJSC Severstal (URL: severstal.com/rus/ir/indicators-reporting/finreps-rsbu/), PJSC MMC Norilsk Nickel (URL: nornickel.ru/investors/disclosure/financials/#accordion-2023), PJSC Surgutneftegas (URL: www.surgutneftegas.ru/investors/essential_information/reporting/godovaya-bukhgalterskaya-finansovaya-otchetnost/?ysclid=lyllbd9fba569637233), Acron Group (URL: www.acron.ru/investors/financial-statements/?ysclid=lyllc4uo84458762929), PJSC Magnit (URL: www.magnit.com/ru/disclosure/financial-statements/) [Accessed on 14.07.24].

due to a short-term reserve for making payments. In medium-sized businesses, the share of balances not placed on deposits may be higher due to less efficient performance of treasury functions and imperfect corporate governance. Some funds may be restricted in use because they are held in bank letters of credit, third-party acceptance accounts and collateral accounts. Moreover, if at the beginning of 2012 the ratio of deposits of organizations was approximately equal to the balances on the accounts of organizations, then as of 2024 deposits are 1.5 times higher than the balances on current accounts[12]. This may be due to the fact that the treasuries of organizations, including non-financial companies, have begun to pay more attention to the placement of temporarily free cash.

Thus, individuals and organizations use non-cash rubles to make payments, which is why there are balances in the accounts that represent cheap liabilities for banks. Banks may also lose some of their revenue from fees for processing payments, since fees for legal entities for payments in digital rubles will be significantly lower than current market prices for payments in non-cash rubles[13]. Therefore, the transition to payments in digital rubles may negatively affect the profitability of commercial banks. Interest rates on deposits for up to 90 days, including short-term deposits (overnight), are much higher for organizations than for individuals. The impact of the introduction of the digital ruble on commercial banks may vary, since, on the one hand, many large banks benefit particularly strongly from the "free liabilities" of the population (Grishchenko et al. 2021), and, on the other hand, the costs of individual market participants for the introduction of the digital ruble are fixed (Niepelt 2024). In this regard, it is important to note that the specific costs of small commercial banks for the implementation of IT infrastructure will be much higher than for large banks. However, for commercial banks, retaining customer funds is important in any case. In connection with the above-mentioned, of particular interest are the possible reactions of banks aimed at mitigating losses from the introduction of the digital ruble and having a potential impact on consumers of financial services. Such reactions include:

- increasing interest rates for individuals on demand deposits, deposits with a term of up to 90 days, accrual of interest on balances in current accounts,
- expansion of loyalty programmes (both in terms of target audience coverage and the availability of benefits, including those described above), expansion of cashback programmes that encourage payments in non-cash rubles,
- the emergence of new and expansion of existing misselling practices.

The potential for increasing rates on deposits of individuals with a term of up to 90 days is due to the fact that historically low interest rates are paid on them relative to the key rate and relative to rates on deposits with longer maturity periods. The term structure of interest rates on deposits for individuals differs significantly from the term structure of interest rates on bonds (in Figure 2, the zero-coupon yield of FLBs is used for comparison with the average level of interest rates).

As can be seen from Figure 2, rates on deposits for individuals for the shortest terms differ significantly from rates for non-financial organizations. If the rates on deposits with a maturity of up to 30 days (including "on demand") of non-financial organizations are close

12 According to the Bank of Russia. Svedeniya o razmeshchennykh i privlechennykh sredstvakh. Bank Rossii. [Information about funds placed and raised. Bank of Russia]. URL: https://cbr.ru/statistics/bank_sector/sors/ [Accessed on 05.06.2024].

13 According to the Bank of Russia. Utverzhdeny tarify po operatsiyam s tsifrovymi rublyami. Bank Rossii [Tariffs for operations with digital rubles have been approved. Bank of Russia]. URL: https://cbr.ru/press/event/?id=16982 [Accessed on 10.06.2024].

to the key rate, then the rates on deposits of individuals are approximately 2 percentage points lower. For deposits of individuals with a term of less than 90 days, rates are, on average, lower than the zero-coupon yield of FLBs.

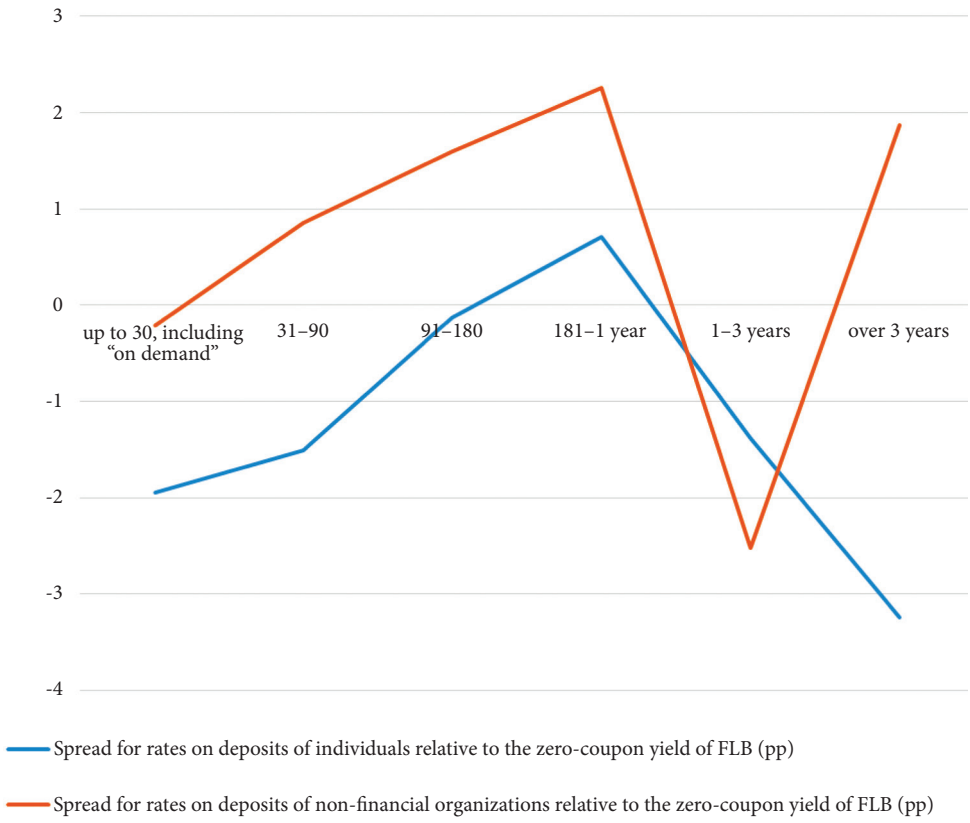

Figure 2. Spreads of deposit rates relative to the zero-coupon yield of FLB as of March 2024 The abscissa axis shows the maturity dates, the ordinate axis shows the spread values (in percentage points). *Source:* calculated by the authors based on data from the Bank of Russia. URL: https://cbr.ru/statistics/bank_sector/int_rat/, https://cbr.ru/hd_base/zcyc_params/ [Accessed on 05.06.2024].

Below in tabular form descriptive statistics of deposit rates and their spreads for 01.01.2014 – 31.01.2025 (133 observations) are presented (see Table 2). Please note that information on interest rates for individuals is provided separately for demand deposits and separately for deposits with a maturity of up to 30 days. For non-financial institutions, only aggregate information on interest rates for the demand and up to 30 days categories is provided.

Based on testing the hypotheses about the equality of means, the following results were obtained:

- The spread between rates on deposits with a term of 31-90 days and a term of up to 30 days (including "on demand") is higher for individuals than for non-financial organizations at the 1% significance level ($t = 6.35$).

Table 2. Descriptive statistics of deposit rates and their spreads

Indicator	Min.	Max.	Average	Median	Standard deviation
Rates for individuals on demand deposits (pp)	1.10	14.38	3.70	3.11	2.11
Rates for individuals on deposits up to 30 days (pp)	1.41	18.93	4.66	3.65	3.12
Rates for non-financial organizations on deposits for up to 30 days, including "on demand" (pp)	3.14	20.75	8.34	7.06	3.93
Spread of rates for individuals on deposits up to 30 days and "on demand" (pp)	-1.51	10.67	3.04	2.54	2.71
Spread of rates for individuals on deposits with a term from 31 to 90 days and up to 30 days including "on demand" (pp)	-1.88	7.37	2.08	1.66	1.94
Spread of rates for non-financial organizations on deposits with a term from 31 to 90 days and up to 30 days including "on demand" (pp)	0.28	4.88	0.85	0.70	0.55
Spread of rates for individuals on deposits with a term from 91 to 180 days and up to 30 days including "on demand" (pp)	-1.58	8.30	2.75	2.28	2.01
Spread of rates for non-financial organizations on deposits with a term from 91 to 180 days and up to 30 days including "on demand" (pp)	0.25	5.99	1.16	1.06	0.70
Spread of rates for individuals on deposits with a term from 181 days to 1 year and up to 30 days including "on demand" (pp)	-4.45	8.61	2.91	2.48	2.19
Spread of rates for non-financial organizations on deposits with a term from 181 days to 1 year and up to 30 days including "on demand" (pp)	0.25	5.99	1.12	1.04	0.67
Spread between demand rates for non-financial organizations and individuals (pp)	0.46	9.15	3.62	2.97	2.24

Source: calculated by the authors based on data from the Bank of Russia. URL: https://cbr.ru/statistics/bank_sector/int_rat/ [Accessed on 21.03.2025].

- The spread between rates on deposits with a term of 91-180 days and a term of up to 30 days (including "on demand") is higher for individuals than for non-financial organizations at the 1% significance level ($t = 9.70$).
- The spread between rates on deposits with a term of 181-365 days and a term of up to 30 days (including "on demand") is higher for individuals than for non-financial organizations at the 1% significance level ($t = 8.66$).
- The spread between rates on deposits for up to 30 days (including "on demand") between non-financial organizations and individuals is positive at the 1% significance level ($t = 198.78$).

Thus, during the period under review, rates on demand deposits and deposits with a maturity of up to 90 days for individuals were, in general, significantly lower than rates with a similar maturity for non-financial organizations. The current situation allows us to conclude that, in the context of competition for funds from individuals, commercial banks had reserves to increase rates on the shortest-term deposits (up to 90 days). As noted above, such an increase in rates could be caused by the spread of mobile banking, the introduction of a fast payment system and the emergence of financial marketplaces.

To test whether there have been changes in the pricing of rates on short-term deposits of individuals and non-financial organizations over time, a regression estimate was conducted based on the ARIMAX model. Monthly data for the period January 2014 – January 2025 were used. The dependent variables used were:

1. The difference in yield spreads for deposits with terms from 31 to 90 days and up to 30 days (including "on demand") for non-financial organizations and individuals;
2. The quotient of the difference in yield spreads on deposits with terms from 31 to 90 days and up to 30 days (including "on demand") for non-financial organizations and individuals and the rate on deposits of individuals with terms from 181 days to one year.

The regression estimates for the first dependent variable do not take into account the potential impact of the average level of interest rates on differences in rates on short-term deposits between individuals and legal entities. Estimates of regressions for the second dependent variable enable taking into account that, in conditions of high interest rates, differences in the pricing of returns on short-term deposits of individuals and legal entities may be observed.

The exact moment from which such changes could have taken effect and been associated with the spread of mobile banking, the introduction of FPS and the emergence of financial marketplaces is impossible to determine. In this regard, within the framework of the quantitative analysis of the dynamics of rates on deposits of individuals, various dummy variables were used, in particular:

- b20237, which takes the values 0 up to and including June 2023 and 1 for each month starting from July 2023. The choice of such a variable is justified by the fact that by mid-2023, a number of financial marketplaces were launched, and relevant publications appeared[14].
- b20245, which takes the values 0 up to and including April 2024 and 1 for each month starting from May 2024. The choice of such a variable is justified by the fact that since May 2024, the operation of the fast payment system has been expanded, and individu-

14 Marketpleysy, kraudfanding i TsFA: itogi razvitiya platformennykh servisov. Bank Rossii [Marketplaces, crowdfunding and CFA: results of the development of platform services. Bank of Russia]. URL: https://cbr.ru/press/event/?id=14760 [Accessed on 24.03.2025].

als have become able to transfer funds to their accounts in other banks up to 30 million rubles per month.

Table 3 presents the results of regression estimation.

Table 3. Modeling differences in yield spreads on deposits of individuals and non-financial organizations with different maturities

Model	1	2	3	4
	The difference in yield spreads for deposits with a term of 31 to 90 days and up to 30 days including "on demand" for non-financial organizations and individuals		The quotient of the difference in yield spreads for deposits with a maturity of 31 to 90 days and up to 30 days including "on demand" for non-financial organizations and individuals and deposit rates for individuals with a maturity of 181 days to a year	
const	1.06***	1.08***	0.11*	0.11**
	(0.45)	(0.42)	(0.06)	(0.06)
AR(1)	0.75***	0.77***	0.81***	0.81***
	(0.06)	(0.06)	(0.05)	(0.05)
b20237	1.19	-	0.09	-
	(0.83)		(0.10)	
b20247	-	1.88*	-	0.11
		(0.97)		(0.11)
The significance of the statistic for the dependent variable in the Augmented Dickey-Fuller test	-2.91 (the series is stationary at the 5% significance level)		-3.08 (the series is stationary at the 5% significance level)	
Significance of the statistics for the residual series in the Dickey-Fuller test	-13.86 (the series is stationary at the 1% significance level)	-13.35 (the series is stationary at the 1% significance level)	-12.85 (the series is stationary at the 1% significance level)	-12.55 (the series is stationary at the 1% significance level)
Standard deviation of dependent variable	1.83	1.83	0.21	0.21
Standard deviation of innovation	1.14	1.13	0.12	0.12
R-squared	0.61	0.62	0.66	0.66
Logarithm of the likelihood function	-206	-205	91	91
Akaike criterion	421	-175	-174	-175

Notes: *** significance at the 1% level, ** significance at the 5% level, * significance at the 10% level.
Source: calculated by the authors in Gretl.

Table 3 shows (models 1 and 2) that the difference between rates on deposits from 31 to 90 days and on deposits up to 30 days for individuals is more than 1 percentage point higher than for legal entities throughout the entire period under consideration (for model 1 the dependence is not significant, for model 2 the dependence is significant at the 1% level). However, in the second half of 2023 – early 2025, no reduction in differences was observed. On the contrary, the coefficient estimates indicate either a significant increase in such differences (models 1 and 2) or, given the general level of interest rates, a statistically insignificant increase (models 3 and 4).

To test the robustness of the results, we also used variables calculated based on the difference in yield spreads on deposits with maturities from 91 to 180 days and up to 30 days (including "on demand") for non-financial organizations and individuals, as well as the difference in yield spreads on deposits with maturities from 181 days to one year and up to 30 days (including "on demand") for non-financial organizations and individuals. Also, since it is impossible to reliably establish the specific point in time from which the phenomena described above (the spread of mobile banking, the introduction of FPS, the emergence of financial marketplaces) began to influence rates on short-term deposits of individuals, various dummy variables were used separately, in particular, taking 0 – until December 2020 and 1 – starting from January 2021, 0 – until December 2021 and 1 – starting from January 2022, etc. Similar results were obtained for all dependent and explanatory variables, which allows us to conclude that there is no evidence that competition between banks for retail funds in recent years has manifested itself in an increase in interest rates on deposits with a maturity of up to 90 days, including demand deposits.

Thus, competition between commercial banks is not reflected in the growth of rates on short-term financial resources of individuals. The deposit market still maintains a situation in which commercial banks pay non-financial organizations interest rates on the shortest-term deposits comparable to the general level of rates, but at the same time pay individuals significantly lower rates on the shortest-term deposits. An analysis of offers posted on the websites and mobile applications of systemically important banks showed that none of these banks accrue interest on the balance. T-Bank (formerly Tinkoff Bank), which had previously followed this practice, cancelled the accrual of interest on the balance of individuals' current accounts from June 5, 2024. Commercial banks offer the opening of savings accounts, including the ability to make payments from them, but the rate on such accounts is significantly lower (by 5-10 percentage points) than the key rate, and usually depends on participation in the bank's loyalty programme and the fulfillment of certain conditions. In some cases, interest is accrued on such an account not on the daily balance, but on the minimum balance for the month, which, when using such an account to place funds with a horizon of several days to 3-4 weeks, makes it a de facto free source of liabilities for the bank. It should be noted that banks compete for short-term funds of individuals not only with each other, but also with money market funds, which provide returns close to the key rate, but the general level of financial literacy does not allow for mass access of consumers of financial services to such funds, while their liquidity is somewhat lower, since an additional working day is usually required to withdraw funds. Thus, neither competition between commercial banks nor the possibility of short-term placement of funds by consumers of financial services in money market funds led to the equalization of rates on short-term deposits to the level that banks offer to non-financial companies.

In addition to raising rates, banks can compete for customer funds by expanding loyalty programmes and cashback practices. This scenario is more likely, since for individuals, receiving cashback is more noticeable than interest. If we assume that the household uses non-

cash rubles for payments, and the average monthly balances on accounts are no more than 50% of expenses, then at the current key rate no more than $\frac{0.18}{12} * \frac{R}{2} \approx 0.0075R$, or 0.75% of R (where R is monthly amount of expenses) will be accrued. This amount is less than a 1% cashback. With regard to the analysis of spreads, it is important to note that in the absence of interest accrual (or with fixed rates) on the CBDC, the spread between the yields of the CBDC and the level of rates in the economy will constantly change (Bindseil 2020). In this sense, competition through rates on short-term funds of financial services consumers has less potential than through loyalty programmes.

In recent years, Russian banks have significantly increased spending on loyalty programmes, primarily on credit and debit cards (Figure 3).

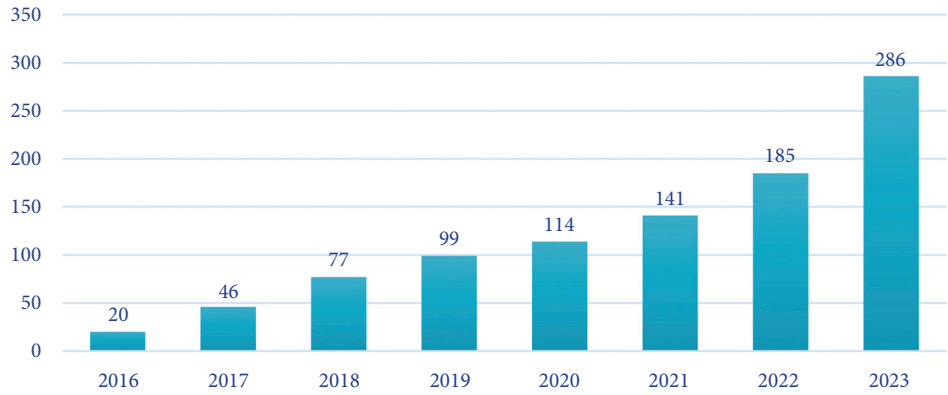

Figure 3. Dynamics of the volume of remuneration paid to clients (billion rubles). *Source:* Trendy rynka reward-programm [Reward Programme Market Trends]. Frank RG (2024)

It is important to note that while the slowdown in the increment rate of expenses on customer rewards programmes after 2017-2018 can be attributed to the initial low base effect, accelerated growth in expenses is again observed from 2021 (see Table 4).

Table 4. Increment rate of expenses on cashback programmes in nominal and real terms.

Year	2017	2018	2019	2020	2021	2022	2023
Nominal increment rate of cashback programme spending compared to the previous year	130.0%	67.4%	28.6%	15.2%	23.7%	31.2%	54.6%
Real increment rate of cashback programme spending compared to the previous year	124.4%	60.5%	24.2%	9.8%	14.1%	17.2%	43.9%

Source: calculated by the authors.

In 2022, banks returned an average of 0.4-1.2% of card spending in the mass segment, and in 2023 the cashback level was 0.5-1.3%, according to Frank RG. There has also been an increase in the share of cards with reward programmes from 56% to 70%. Based on the

information available as of mid-2024, it can be concluded that commercial banks continue to follow this trend. Thus, for 2024, VTB Bank planned for investment in the loyalty programme to grow by 1.8 times compared to 2023.

At the moment, the main reason for such an increase in bank expenses is the growing competition associated with the active implementation of the Fast Payment System (FPS), including in terms of expanding the limits on transfers of funds without commission. It is likely that in the future, in connection with the introduction of the digital ruble, banks will continue to improve customer service, but at the same time will introduce higher additional requirements. For example, to receive cashback and maintain loyalty programme participant status, the requirements for the minimum monthly payment volume or minimum asset balance will be increased.

In general, the very possibility of using digital rubles by individuals will create incentives for commercial banks to motivate clients more strongly to place non-cash money with them, which can lead to an improvement in the quality of service (including an increase in rates for individuals, the development of cashback programmes) and the emergence of new advantageous offers for clients. Along with cashback, additional discounts can be introduced; this practice is already used by a number of marketplaces when paying with bank cards. Also, with the introduction of digital rubles, competition in the financial market will increase, and new innovative services may appear. Thus, the most likely scenario will be to expand the reach and content of comprehensive customer loyalty programmes. This may lead to some gains for ecosystem banks, which have more opportunities to maintain customer loyalty.

At the same time, there is an obstacle to expanding cashback programmes. As noted earlier, when paying for goods and services with digital rubles, commissions will be lower than when paying with non-cash rubles. Cashback is ultimately paid from the acquiring fee. If a legal entity receiving a payment gives a discount for payment in digital rubles, then the demand for payments in non-cash rubles, even if cashback is received, may decrease. Therefore, the presence of cashback programmes does not guarantee the preservation of payments in non-cash rubles.

Loss of part of the income of commercial banks may have a negative effect. The emergence of new and expansion of existing misselling practices may become a serious problem. In the context of losing a significant portion of income, the risks of finding unethical ways to increase income are heightened, including the practice of selling non-transparent financial instruments, predatory lending (Beck et al. 2012; Frolova 2018; Frolova 2021), and, in general, violating ethical standards in terms of customer care and appropriateness (CFA Institute 2014; Gurov 2024). The realization of such risks will be extremely negative for consumers of financial services.

Thus, with the introduction of the digital ruble, consumers of financial services, on the one hand, receive a new payment instrument and, at the same time, can benefit from improved quality of customer service in banks and expansion of loyalty programmes. On the other hand, due to potential losses of income for banks, the risks of their unscrupulous behaviour aimed at replacing lost income are growing.

Discussion

This study shows that the introduction of the digital ruble has made a new convenient payment instrument available to consumers of financial services. The introduction of the digital ruble also leads to increased transparency, which will have a positive impact on consumers

of financial services. Commercial banks, faced with the risk of losing income from "free" and cheap deposits and from conducting payment transactions, on the one hand, can expand loyalty programmes, increase interest rates on demand deposits, accrue interest on balances on current accounts, and expand cashback programmes. However, the transfer of some payments into digital rubles may lead to a reduction in banking business. In the literature on financial development, the "too much finance" hypothesis (Arcand et al. 2015) stands out, formed against the background of a consensus that the development of the financial sector has a direct causal influence on the development of the economy. However, there is a saturation point after which further development of the financial sector will harm economic development (Danilov 2019). Financial technologies, including the digital ruble, reduce the need for a number of financial services, and as a result, the saturation point in the development of the financial sector may decrease. As a result of the introduction of the digital ruble, one can expect not only a drop in the income of commercial banks, but also a reduction in the segment of the financial sector that is engaged in ensuring settlement transactions. For banks, on the one hand, this should be an incentive to concentrate their efforts on those operations in which they have the greatest expertise and which have a beneficial effect on the performance of the functions of the financial sector. On the other hand, there are high risks of misselling and violation of ethical standards by banks when trying to replace income from cheap deposits and payment fees. In this regard, it is important to expand the practices of behavioural supervision[15], including in the area of secret purchases, analysis of commercial banks' offers to consumers of financial services, monitoring of officially submitted complaints, reviews of the work of commercial banks left on the Internet (for example, on websites, banki.ru, sravni.ru, in Telegram channels) using text parsing. In addition, it is possible to introduce mandatory video recording of sales of non-standard financial products (including interviews to check the consumer's understanding of the offered product); such video recordings should be available to the Bank of Russia. It is useful to introduce and expand the practice of "cooling-off periods" when selling non-standard financial products, to establish restrictions on the sale of financial products to certain categories of consumers of financial services if they are obviously inappropriate for them (for example, financial products with the need for multi-year replenishment for elderly people)[16]. It is also important to note in this regard that in the event of considering the issue of partial compensation for losses to banks from the introduction of digital rubles (on the one hand, the introduction of the digital ruble will have a negative impact on small banks due to the high specific costs of implementing IT solutions, on the other hand, it is large banks that will be the first to lose access to cheap liabilities in the event of the transition to the digital ruble)[17], the criterion for receiving such assistance should be the absence of evidence of unethical behaviour on the part of the commercial bank.

Based on the above-mentioned, the introduction of the digital ruble will have a significant impact on the utility of consumers of financial services. On the one hand, the digital ruble

15 Povedencheskiy nadzor: praktiki i rekomendatsii. Bank Rossii [Behavioral supervision: practices and recommendations. Bank of Russia] URL: cbr.ru/protection_rights/behavioral_surveillance/ [Accessed on 02.01.2025]

16 For more details, see the materials of the round table «Zolotaya osen' investicij: veliki li kognitivnye riski finansovogo dolgoletiya?» ["Golden Autumn of Investments: Are the Cognitive Risks of Financial Longevity Great?"] https://vk.com/video-227637564_456239020 [Accessed on 02.01.2025].

17 Also, the expansion of the deposit insurance programme may be considered as a measure to support banks in connection with the introduction of the digital ruble.

is the new most liquid means of payment, and therefore its introduction expands the ability of consumers to allocate their funds between less liquid but interest-bearing instruments and the digital ruble (Penikas 2021). The intertemporal budget constraint of consumers of financial services may be influenced by multiple factors. Reducing payment transaction costs and expanding loyalty programmes may lead to an expansion of the budget constraint and an increase in utility. A potential (but unlikely) increase in short-term deposit rates for individuals to the level of similar rates for institutions could also be beneficial for saving households. At the same time, the potential increase in the cost of borrowing (Keister and Sanches 2019) could lead to a reduction in the budget constraint of borrowing households. It should also be noted that the growth of interest rates, along with measures to stimulate the practice of conducting preliminary initial public offering (pre-IPO) procedures and the IPO itself, can make equity financing more attractive, which, on the one hand, will facilitate companies' entry into IPO (Galich and Mirzoyan 2024; Segal 2025), and on the other hand, will maintain high values of risk premiums in the structure of required returns.

This study noted that depending on the level of financial literacy, the ability of financial services consumers to use digital rubles, as well as their exposure to risks associated with fraudulent activities, may differ. At the same time, the spread of digital rubles may lead to an increase in financial culture, since the population will receive more information from banks about the possibility of receiving interest income on the money that households keep in current accounts, and they will be viewed as an asset that can generate income. However, the introduction of the digital ruble must be accompanied by proper information for consumers of financial services, including through the publication of accessible text and video information prepared with the participation or at the initiative of the Bank of Russia, notifications from commercial banks in mobile applications and newsletters, and through the inclusion of materials about the digital ruble in textbooks and educational courses on financial literacy. Considering the high scalability of such information, the specific costs (per 1 consumer of financial services) will be low. Taking into account the current low level of awareness about the digital ruble[18], the development of approaches to such information is of scientific and practical interest.

Also of interest is the analysis of the possibilities of using digital currencies for international settlements of both businesses and individuals (Grigoriev 2023). In particular, demand for the digital ruble may be formed in countries with high inflation (in particular, Venezuela, Brazil, Turkey), provided that interoperability is ensured by foreign partner banks[19]. For Russian citizens, such an expansion of the circulation of digital rubles is beneficial, especially in the context of developing trade and tourism with these countries.

A number of studies propose limiting the balances of the central bank funds in the accounts of individual economic agents, which may be a favourable measure when implemented (Meller and Soons 2023; Di Iorio et al. 2024). The results of this study show that such limits may be useful at the stage of introducing the digital ruble, as they will limit potentially negative aspects associated with competition between commercial banks, and also limit cyber risks. At the same time, maintaining such restrictions in the long term is not advisable, since these restrictions will not allow for the benefits associated with the transparency and

18 Cifrovoj rubl': za i protiv [Digital ruble: pros and cons]. VCIOM, 14.08.2024. URL: wciom.ru/analytical-reviews/analiticheskii-obzor/cifrovoi-rubl-za-i-protiv?ysclid=m21vxzqi1b441823804 [Accessed on 23.09.2024].

19 According to Startus Insights. URL: https://www.startus-insights.com/innovators-guide/cbdc-news-brief/ [Accessed on 23.09.2024].

security of financial transactions, nor with the availability of a financial instrument with the greatest liquidity and the absence of credit risk.

Due to the fact that the population will benefit from the introduction of digital rubles due to the emergence of a new liquid payment instrument without credit risks, increased competition between banks for customer funds, the results of the study confirm the feasibility of introducing digital rubles, which is consistent with the conclusions of a number of studies (Penikas 2022; Grigoriev 2023). However, the results of the study also support the need to expand research into the potential implementation of the digital ruble, detailing the parameters of its use and ensuring payment security (Keister and Monnet 2022; Eisenbach et al. 2022; Ballivian and Tombini 2023; Niepelt 2024).

Conclusion

The article highlights the direct and indirect effects of the introduction of the digital ruble. The direct effect is the emergence of a new convenient payment instrument for consumers of financial services, which allows for a reduction in transaction costs and credit risks. At the same time, the introduction of the digital ruble will lead to a change in the profiles of transparency and security of payment transactions. The indirect effect is increased competition among commercial banks for customer funds. If the patterns of competitive behaviour of commercial banks persist, then in order to retain customer funds, banks will expand loyalty programmes and increase requirements for loyalty programme participants. The scenario of increasing rates on short-term deposits of individuals to the level of rates on deposits of organizations with the same maturity is unlikely, but it cannot be ruled out. Thus, after the introduction of the digital ruble, banks may increase the interest rates that accrue on demand accounts in order to encourage private clients to keep remaining funds in non-cash rubles. This assumption is related to the fact that the alternative for commercial banks will be to attract money at the key rate from the central bank, in connection with which the maximum rate on demand deposits may be approximately equal to the key rate. Market equilibrium can be achieved both with a minimal reduction in the spread and with values reaching around the interest rate.

At the same time, this paper concludes that it is necessary to increase control over misselling practices, since banks may, through unethical practices of selling products that are unprofitable for consumers of financial services, try to replace the lost income due to the introduction of digital rubles. It is also necessary to ensure that consumers of financial services are properly informed about the possibilities of the digital ruble and to ensure control of technological risks and protection against cyberattacks during the mass implementation of the digital ruble.

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