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ECONOMIC AND INSTITUTIONAL ANALYSIS OF DOMESTIC DIGITAL FINANCIAL MARKET TRENDS

A. M. Mikhaylov (a), N. A. Petrov (b)*
*Corresponding author

(a) Samara State University of Economics, Soviet Army Str., 141, Samara, Russia, 2427994@mail.ru
(b) Samara State University of Economics, Soviet Army Str., 141, Samara, Russia, petrovnkt@gmail.com

Abstract

The modern digital financial services market can be characterized as a set of classical credit and non-credit institutions with a range of financial products available to them with the latest innovative achievements of companies that are manufacturers of solutions in the field of digital financial assets. The improvement in the range of financial products and digital financial services provided is due to the very time in which the consumer is to resort to financial institutions as intermediaries in monetary transactions between counterparties. The latter circumstance is due to the development of mobile gadgets which provide customers' access to Internet banking without a personal visit to the bank's office. The development of new types of services and a line of financial products, in general, is caused by the growing competition of financial counterparties with each other, as well as with organizations that have not previously been involved in the provision of digital financial services. The subject of the research is economic and institutional relations arising in the process of providing potential and current consumers of financial services with new digital financial products, as well as the process of their regulation. The factor that significantly slows down the development of the digital financial sector is the lack of both domestic and foreign investment. Currently, only very large banks can allow the development of digital technologies planned for implementation in financial transactions.

Keywords: Competition, cryptocurrency, financial technology, institutional environment, neobank

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1. Introduction

Currently, there is uncertainty in determining the range of application of the current law to the digital financial sector, which is actively used in digital financial transactions. The key problem of regulating the scope of application of financial technologies in the economy (hereinafter - Fintech) is the lag of regulatory bodies behind trends in the field of technological innovation. In the process of diverting a significant part of their resources to understand the newly emerging technology, market macro regulators run the risk of developing a final regulatory document that does not correspond to the emerging economic and technical realities.

Digital transformation is proceeding so quickly that government regulation does not have time to change the regulatory framework for its implementation and, in this regard, often acts as an inhibitory element of this process (Yang & He, 2019). At the same time, as mentioned above, macro-regulators understand that they become a barrier to some technologies that cannot be used in the absence of legal mechanisms for their implementation. As a result, tasks are being formed to reduce regulatory restrictions, create favorable conditions for new financial services and software products, and stimulate innovation in the Russian financial market.

The expansion of the areas and frequency of application of digital financial services will receive its further logical development in close accompaniment with the improvement of financial technologies. According to the forecast for the development and application of financial technologies in the Russian economy, made by Ernst & Young (2018) experts, about 50% of most financial transactions will be carried out through digital transactions by 2035 (Figure 1).

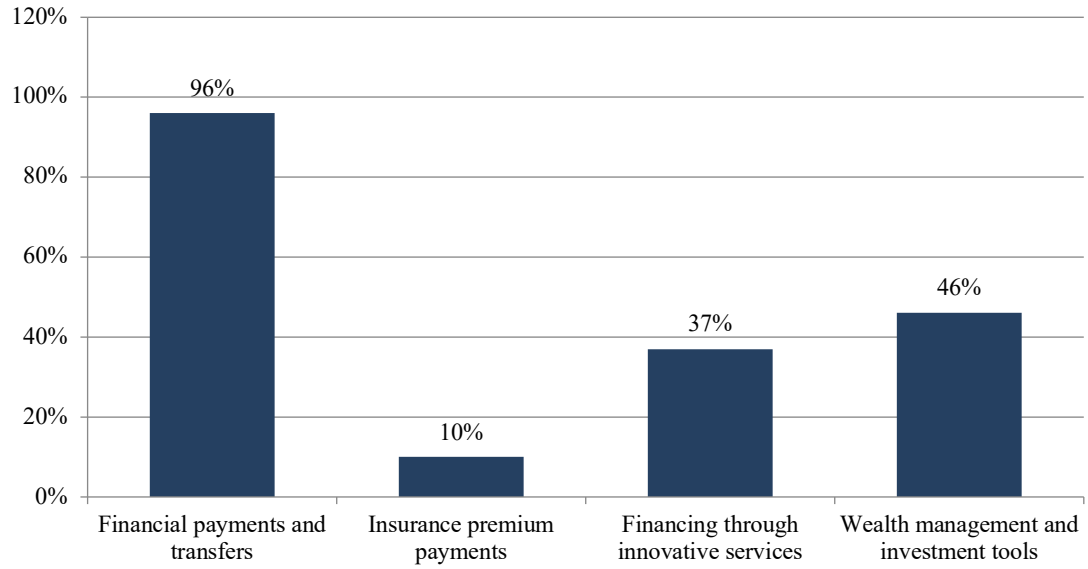

Figure 1. Prospects for the introduction of innovative financial technologies in the use of digital financial services, as a percentage of total use
Source: authors based on (Ernst &Young, 2018).

Based on the foregoing, the undoubted incentive in the development of digital financial services through innovative technologies in the domestic economy is the approval of the program “Digital Economy

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of the Russian Federation" (Order of the Government of the Russian Federation No. 1632-r, 2017) by the Government of the Russian Federation in July 2017.

2. Problem Statement

Among the most anticipated changes in mechanisms for improving the digital financial market in Russia, the following can be distinguished: lower barriers to entry and increased competition in the high-tech financial services market; increasing the degree of confidence of the population and business (especially micro and small businesses) in the work of financial institutions; increasing the level of financial stability and availability of financial services and funding sources in general (Ledneva & Povetkina, 2018).

The current Fintech 3.0 system (based mainly on startups) differs fundamentally from its previous version Fintech 2.0 (traditional financial institutions) - all technological solutions were developed by participants in the digital financial sector and they also carried out self-regulation. Market macro regulators turned to Fintech's control only when identifying negative scenarios of legal consequences in introducing certain financial technologies (Filippov, 2018).

Considering the fact of a greater impact on the digital financial sector of banks, as well as to promptly make the necessary changes to the existing regulatory framework, the Bank of Russia created the Fintech Association in 2017, which studies financial technologies, as well as ensures control over the transfer of ownership of financial instruments (Bank of Russia, 2019). Another problem of Fintech regulation is the lag, and in some cases, untimely adaptation of new information terms contained in draft laws of market macro regulators to the modern legal field (Tereshchenko, 2016).

The problem that really hinders the development of the Fintech industry is the lack of a specialized regulatory mechanism, which casts legal doubt on a separate range of operations, for example, the circulation of cryptocurrencies in the field of financial transactions (Balachandran & Williams, 2018). Also, one of the problems of regulation of the digital financial sector is the lack of competent personnel with high level of knowledge necessary to detect and prevent cybercrime in the future. To mitigate this risk, individual educational institutions are planning to introduce professional standards "Cybersecurity Specialist" and "Digital Financial Specialist".

3. Research Questions

The study, conducted by the Bank of Russia, concerning the analysis of the current institutional environment in the domestic financial market is very interesting (Bank of Russia, 2019). The study covered various segments of the financial market, based on target indicators of operational efficiency in each of the financial segments. Based on the results shown in the table below, one can judge the imperfection of the current financial market, namely the institutional environment that regulates it.

As of 2018, only 28 (12%) indicators, out of 233, were implemented and 124 indicators are under active development (53%). Thus, about 35% of the "institutional field" of the financial market remains unaffected by the latest trends in financial innovation. Table 1 shows the key areas of the domestic financial market and the degree of development of institutional indicators that characterize its state.

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Table 1. Indicators of the institutional environment of the domestic financial market

Financial market area	Number of characterizing indicators, units	Stage of development, quantity in units	Stage of implementation, quantity in units	KPI: (3+4)/2
Insurance market	26	12	4	0,62
Pension market	18	9	4	0,72
Investment funds	39	16	3	0,49
Professional market participants	32	18	3	0,66
Commodity market	10	5	2	0,24
Financial infrastructure	18	9	2	0,61
Issue / listing	20	9	3	0,4
Corporate governance	17	12	1	0,76
MFO	26	14	6	0,77
Actuarial activity	15	14	0	0,93
Activities of national rating agencies	12	8	0	0,67
TOTAL	233	124	28	0,65

Source: authors.

An increase in the level of competition is planned to be achieved through the development of availability of digital customer identification platforms, the introduction of open APIs to unify the interaction of counterparties (Ashraf, 2018). The most important component of the national digital financial environment is increasing the level of trust in financial institutions. The growth factor of the national economy is undoubtedly an increase in the level of liquidity of the domestic financial market and the development of tools for non-cash transactions (Munemo, 2017).

4. Purpose of the Study

One of the purposes of this study was to identify the key areas for the implementation of RegTech and SupTech events. RegTech is a digital mechanism for the compliance of market counterparties with the requirements of market macro regulators, SupTech is a direct process of automation of the compliance with the supervisory requirements of macro regulators. The main regulator of the digital financial sector in the Russian Federation is the Central Bank of the Russian Federation. In this direction, the Bank of Russia is taking measures to develop regulatory and supervisory technologies (RegTech and SupTech, respectively). Summarizing the areas of regulation, Table 2 lists the key ones (Bank of Russia, 2019).

Table 2. Main approaches to regulatory and supervisory directions

Timeframe	Regulation / supervision	Implementation
Implementation has been ongoing from 2015 to the present	Implementation of the XBRL format	Standardization of reporting parameters in the field of accounting, regulation and supervision. Building detailed analytics by economic sectors.
Until 2022	Development of a cyber risk management mechanism	Development of systems for the independent security external audit of digital financial infrastructure; mass adoption of cryptographic authentication tools in financial markets. Development of the system of the Central Bank of the Russian Federation “Antifraud”; strengthening oversight of compliance with cyber resilience requirements.

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End of 2020	Collecting and researching operational data for a working day	Collecting and processing a single daily reporting format from commercial banks. Elimination of redundant and duplicate forms.
To the present	Development of ways to automate the calculation of standards	Development of KLIKO software (automatic calculation of mandatory standards for participants in the banking industry).
End of 2020	Inclusion of legal entities in a vertically and horizontally integrated group: automation of interconnection of legal entities	Using graph analytics to identify criteria for the economic and legal relationship of legal entities. Determination of the debt burden on the group of enterprises and the aggregate cash flow of the group.
From 2017 – to the present	Creation of a system that accumulates requests from financial market participants.	Development of models of behavioral monitoring of market participants to improve the quality of financial services provided.
From 2019 - to the present	Development of a unified register of pledges for a macro regulator and other participants in the financial market	A unified automated platform that allows you to determine the format, type and term of encumbrance of movable and immovable property.
To the present	Countering cyber fraud	Development of complex automated software that allows detecting suspicious financial transactions and trades.
To the present	Development of a system for risk control and prevention	Implementation of the project “Information system of validation and supervision”.

Source: authors.

In addition to the work carried out in terms of determining the ways of institutional transformation of the digital economy in Russia, the study posed and solved the problem of determining the level of competitiveness of the banking sector, as the most developed in terms of availability and provision of financial products to legal entities and individuals. The task of identifying new participants in the financial transactions market - neobanks - has also been solved. Also, the purpose of the study is to find and propose measures aimed at improving the quality of financial services provided and increasing the range of banking products. So, it is necessary to solve the problem of the absence of serious competition in the Fintech industry, which hinders the development of modern high-tech solutions.

5. Research Methods

The study of the financial market structure cannot be carried out without a detailed analysis of its participants, namely the study of the aspect that shows how competitive the market of banking services in Russia is. Since the level of monopolization of the financial market depends not only on the range of provided banking products and their cost, but also on the level of innovation in the lending mechanism, the performance of settlement and cash transactions, currency exchange operations and the functioning of other banking products and services.

To study the situation on the domestic market of banking services in the context of its participants, a few statistical indicators were used, and a model of market monopolization was built. For this, the following coefficients were used in the analysis: Concentration ratio CR; Herfindahl - Hirschman index; Hall – Tideman Index (Filippov, 2018; Ozili, 2018; Tereshchenko, 2016).

One of the most accessible for calculation and effective indicators, in terms of the interpretation of the results, is the Concentration ratio - CR. It can be calculated as follows:

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$$CRn = \sum_{i=1}^{n} S_i,$$

It is calculated as the sum of the occupied shares (Sn) of the largest companies in the market. The closer the indicator is to 100, the more monopolized the market is. This ratio can be calculated for a different number of companies; in this study, the 3 largest credit and financial institutions (Sberbank, VTB, Gazprombank) are selected based on their share of the domestic banking market and annual indicators of the balance sheet currency. The disadvantage of this ratio is that it ignores the distribution of market shares of the companies themselves, the values of which are included in this indicator.

The next indicator we use is Herfindahl-Hirschman index (HHI index). It reflects the degree of monopolization of the market, calculated as the sum of squares of percentages of the market (S_n^2), occupied by its individual player. You can calculate it as follows:

$$HHI = \sum_{i=1}^{n} S_i^2 \quad ,$$

$$HHI = S_1^2 + S_2^2 + \ldots + S_n^2$$

To determine HHI index, the most significant participant with its market share is initially included in the analysis and new agents are added to the analysis before the start of a significant adjustment of the index. It is assumed that, in theory, the maximum value of HHI index can reach 10,000 (1 participant with 100% market share). There are three key groups of market monopolization:

Group I: the most significant share of counterparties in a specific market

1,800 <HHI <10,000

Group II: the market situation is close to oligopoly

1,000 <HHI <1,800

III group: the most competitive market

HHI <1,000

Hall-Tideman Index (HT - index) is determined based on a comparison of the ranks of firms in the market (the rank can be determined based on the level of capitalization of the company, the level of revenue, sales and other indicators). Calculated as follows:

$$HT = \frac{1}{2\sum_{i=1}^{N} R_i y_i - 1},$$

where Ri is an indicator of the rank of the organization in the market, yi is the share of this organization.

Using this index, you can analyze firms in the industry in terms of their importance, both for the industry and for the economy.

6. Findings

Based on the data in Table 1, the analysis of the domestic institutional field was carried out. Figure 02 shows that up to the boundaries of the designated KPI indicators (blue line), many areas of the financial market “fall short”, except for actuarial activity (determining the amount of insurance rates, monitoring and evaluating the activities of insurance companies in general).

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Using the methodology proposed in the study by the Bank of Russia, the key threshold values for each of the areas for improving the digital financial services market in the Russian Federation for the period up to 2021 were reflected in Figure 2 and Table 3 (Bank of Russia 2019).

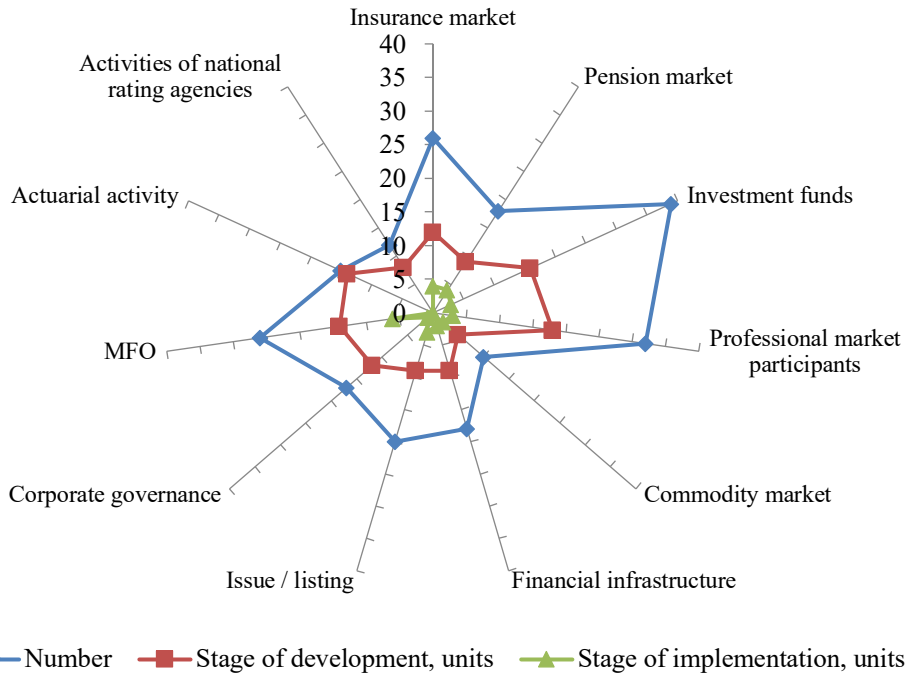

Figure 2. State of the current institutional environment of the financial sector in the Russian economy
Source: authors.

Table 3. Key indicators of the level of development of the digital financial services market in the Russian Federation

Indicator	Actual value	Planned value
Level of competition development in local financial markets	82%	73%
Share of financial products, access to which is available through RBS	81%	86%
Confidence of counterparties in the work of the credit and financial sector and security of financial transactions	69%	81%
Share of unauthorized transfers using payment cards to the total volume	0,002%	<0,005%
Index of affordability for the domestic financial services business	3,5%	3,7%
Index of affordability of financial services for the population	6%	6,2%
Share of bonds placed in the country by residents in the total volume of funding sources	21,4%	26%

Source: authors.

Analyzing the general conjuncture of the domestic banking sector in terms of the dynamics of its participants, we can indicate the following: the number of players in the banking services market as of 01.01.2018 amounted to 561 organizations with a corresponding license. Compared to 2008, there is a significant decrease in the number of participants (a decrease of more than 50%), and a decrease in the number of banks is observed in all Federal Districts. So, for example, in the Central Federal District, the

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number of organizations with a banking license decreased in 2018 compared to 2008 by 313 organizations (-50.5%) and amounted to 319 participants. In the Volga Federal District, the reduction in the number of participants in the same period amounted to 63 market participants (-52.9%, to 71 organizations), and in the Northwestern Federal District, the number of organizations holding a banking license amounted to 43 participants (-53.1%) in 2018 compared to the number of organizations per 2008 year. In Russia as a whole, the number of participants in the banking market from 2008 to 2018 decreased from 1136 to 561 organizations (-49.4%) (Bank of Russia, 2019).

The number of credit institutions is decreasing due to revocation of their licenses for reasons of violation of banking legislation, realization of risks of clients and investors. So, for example, according to the Central Bank of the Russian Federation for 2019, licenses were revoked from 5 banks, including:

- B&N Bank Digital (license revoked on 01.01.2019, reason: liquidation);
- B&N Bank (license revoked on 01.01.2019, reason: liquidation, merger with FC Otkritie);
- Eurocapital-Alliance (license revoked on 25.01.2019, reason: inconsistency with the law);
- Kamchatkomagroprombank (license revoked on 30.01.2019, reason: inconsistency with the law);
- Radiotechbank (license revoked on 31.01.2019, reason: inconsistency with the law).

The process of the emergence of new credit institutions and liquidation of existing ones is an objective process in the economy, but the most important is preservation of the existing systemically important credit and financial institutions, whose activities the economic growth in the country and economic national security depend on.

In the Russian Federation, as of October 14, 2019, the following important systemically important banks are included: AO UniCredit Bank, Bank GPB (AO), VTB Bank (PJSC), AO Alfa-Bank, PJSC Sberbank, PJSC “Moscow Credit Bank”, PJSC Bank FC Otkritie, PJSC Rosbank, PJSC Promsvyazbank, JSC Raiffeisenbank, JSC Rosselkhozbank. Table 4 shows the indicators of the balance sheet of these credit and financial institutions and their share in the domestic banking sector (Bank of Russia, 2019).

Table 4. The most significant backbone banks of the Russian Federation

Credit and financial institution	Balance sheet, billion RUB	Share in the domestic banking sector, %
Sberbank	26 899	29,2
VTB	13 642	14,8
Gazprombank	6 151	6,7
RSHB	3 338	3,6
Alfa-Bank	3 215	3,5
FC Otkritie	1 392	1,5
UniCredit Bank	1 357	1,5
PSB	1 257	1,4
Raiffeisenbank	1 115	1,2
TOTAL	58 366 (as of 01.01.2019, according to banki.ru, the value of assets of all banks that publish reports was 92,100 billion rubles.)	63% across the entire banking system

Source: authors.

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Thus, analyzing the structure of the domestic banking market, one can see that 9 banks in the country occupy more than 60% of the entire banking sector in the country. However, this fact does not show how strong the degree of monopolization of the domestic market of banking services is in the context of products themselves. For example, PJSC Sberbank occupies a leading position in connection with historical conditions of development, Rosbank, being a division of French bank Société Générale, has occupied a leading position in car lending for quite a long time. Therefore, it is necessary to conduct a quantitative and qualitative analysis of the level of competition in the Russian banking market in the context of financial products provided to them. The results of this analysis are presented in Table 5 based on the calculation methodology described above.

Table 5. A summary study of the level of competition in the banking services market in the Russian Federation

Index/year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of banks, units	1108	1058	1012	978	956	923	834	733	623	561	484
CR_3, %	37,91	41,29	43,2	42,3	42,41	44,52	46,42	47,27	47,68	49,49	49,41
HHI	0,36	0,42	0,42	0,43	0,43	0,45	0,47	0,48	0,47	0,48	0,49
HT	0,991	0,992	0,993	0,995	0,992	0,994	0,994	0,995	0,994	0,995	0,995

Source: authors.

The authors studied the dynamics of competition in the domestic banking system objectively, and despite the emergence of new participants in the financial market, for example, neobanks that are considered, the indicators of competitiveness of the domestic banking sector define it as oligopolistic, but do not require immediate intervention of antimonopoly institutions. At the same time, there is a noticeable tendency towards the deepening of the degree of monopolization of the banking services market based on CR3 and HHI data. Such structuring of the market, from the point of view of its participants, can have a stimulating effect on the ongoing transformation processes of the digital financial services provided. When examining the influence of the financial sector on the modern banking system, it is important to point out the formation of a fundamentally new model of banks: neobanks that are actively using the latest achievements of the Fintech area in their operations. So, among the existing banks, the following institutions can be distinguished (Table 6) that fall under the definition of a neobank (with a characteristic model of market behavior for each):

Table 6. Categorization of neobanks

Banks	Model	Description
Tinkoff Bank, Modul Bank, Bank 131	Model 1	Digital banks with their own license. All banks are engaged in comprehensive customer service for the provision of banking products and accompany their customers throughout the entire interaction process.
Yandex. Money	Model 2	Virtual bank with limited license. 75% of shares are owned by PJSC Sberbank. Does not have the right to issue a loan and accept funds to a deposit account. Field of activity: settlement and cash services, acquiring, card issuance.

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Tochka, Delobank, Rocket	Model 3	Branches of traditional credit institutions. They are licensed by parent banks. They are a technical solution in the field of providing customers with banking services.
Sphere, Prosto Bank, Megafon Bank, Elba Bank	Model 4	They are a "corporate startup". The company is not necessarily a lending institution. It is possible to use a license of a partner bank.
Talkbank	Model 5	Digital bank, which is a startup and, at the same time, an independent legal entity. Featured on social networks.

Source: authors.

In 2019, BloomChain Research agency experts conducted a study of the online resource Public Procurement to determine the volume of government spending planned for investment in digital transformation (BloomChain Research, 2019). According to the national program "Digital Economy", it is planned to provide more than 1 trillion rubles from the federal budget for the development of the domestic segment of the digital economy and more than 535 billion rubles from extra-budgetary sources (Order of the Government of the Russian Federation No. 1632-r, 2017). Figure 3 shows the structure of expenses for the largest federal projects.

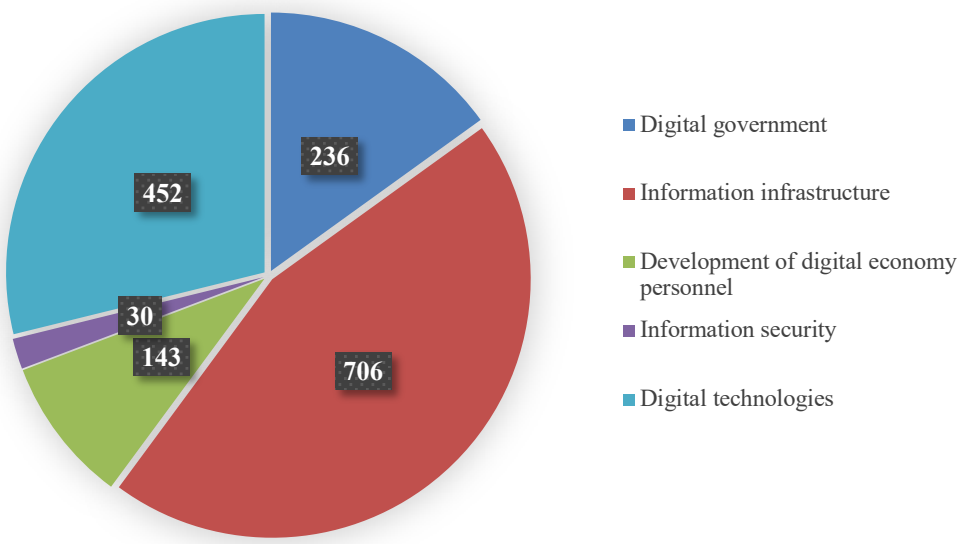

Figure 3. The structure of government spending on the development of the digital economy in Russia, billion rubles
Source: authors based on (BloomChain Research, 2019).

7. Conclusion

7.1. The key findings of the evaluation

The monopoly of banks on lending has been declining in recent years, and new ways of attracting investment by market entities are emerging (Ozili, 2018). In the digital economy, in addition to traditional (equity and borrowed capital) methods of financing, an approach related to the issue of digital financial assets called cryptocurrencies and called the initial placement of cryptocurrencies (hereinafter - ICO) can be used. The cost of ICO tokens is usually lower than the IPO share price: for example, tokens can cost less than one dollar, and the cost of shares can be several tens of dollars (Calcagnini et al., 2019). At the same

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time, ICO tokens are a currency that investors can use as a means of payment if the situation develops favorably. IPO shares are securities that cannot be used as a means of payment.

You can also consider STO (Security Token Offering) as an alternative providing investors with a higher level of security. STO (Security Tokens) allows a business to sell shares of its company in the form of a tokenized asset. They are backed by various financial rights of investors, including dividends, stocks and other financial instruments. In general terms, STO operates as an investment vehicle. In addition, security tokens represent a share of ownership in a company, like traditional shares, and give the right to receive dividends and other financial benefits (Huang et al., 2019).

7.2. Future research

Among the most promising vectors for the development of the domestic digital financial services market are:

- develop healthy competition between financial market participants (providing conditions for collecting and processing data, developing electronic document management (e-invoicing)), provide free implementation of elements of open platforms and create legal conditions for the smooth circulation of digital financial assets;

- assist in infrastructure platforms (conclusion of transactions on the Marketplace, development of solutions for the digital profile of participants in transactions, provision of clientele against cyber threats);

- increasing the quality and quantity of available financial products;

- develop instruments for long-term debt financing;

- assist in corporate relations;

- Develop international cooperation, primarily with the BRICS countries and the EAEU;

- ensure the rights of investors, residents and non-residents;

- increase the level of financial literacy of participants in financial transactions;

- implement Open API standards and distribute Open Banking technologies to accounts of non-bank financial institutions;

- ensure proportionality in the regulation of professional participants in the securities market, including in relation to the requirements for their reporting;

- ensure equal opportunities for cross-identification of clients for credit institutions and investment companies providing intermediary services;

- develop the institution of regulatory arbitration between providers of financial services, for example, between credit and non-credit organizations in terms of information and technological accessibility of customer data, guarantees to protect the property interests of customers

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