

# Analysis of digital profile of the financial market: a methodological approach of Russian Central Bank

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**Abstract.** Currently the processes of digitalization have a strong impact on all spheres of society. Fundamental changes are observed in the economy due to digital expansion, implementing and usage of various modern technologies. The financial market as an essential part of the economy was the first thing that had to be digitalized. The Central Bank of the Russian Federation is actively engaged in the development of financial technologies in the financial market. Financial technologies can affect the availability of financial products and services, which in the future will contribute to sustainable development and increase the competitiveness of the entire financial sector. The Central Bank of the Russian Federation as a megaregulator monitors the financial market and currently a comprehensive system of relevant indicators is being formed. It is to assess the specifics of different profiles of the financial market, reflecting its most important characteristics, including the level of digitalization. It has been recognized to take a closer look at the description of such a concept as the digital profile of the financial market. To describe the entire financial market, we need comprehensive methodological approach that would reflect its characteristics. The research was conducted on the basis of studying the existing experience of analyzing the market of financial and technological services, its features, as well as methods and indicators for assessing the level of digitalization of the financial sector. The article proposed the concept of a digital profile of the financial market and developed a methodological approach for its analysis in order to implement the functions of the Central Bank of Russian Federation.

**Keywords:** digitization on financial markets, digital profile of financial market, Fintech, Central Bank of Russian Federation, financial technologies.

## 1 Introduction

The role of the state in digital transformation is to create conditions that will allow rapid and effective implementation of innovative technologies in both the financial and non-financial

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sectors of the economy, while ensuring a high level of confidence and security in such technologies from the nation and domestic organizations. Based on this, the Central Bank of the Russian Federation, in cooperation with interested government agencies and financial market participants, implements joint initiatives to create and develop financial technologies and digital financial infrastructure. The implementation of measures for the development of the new digital financial infrastructure is provided for by the main directions for the development of financial technologies for the period 2018-2020, approved by the Board of Directors of the Bank of Russia.

Financial technologies (Fintech) is the allocation of financial services and services using innovative technologies such as Big Data, artificial intelligence and machine learning, robotics, blockchain, cloud technologies, biometrics, and others [1].

In this period of time, financial technologies are becoming an integral part of all types of financial services: lending, payments and transfers, savings, investment, insurance, etc., transforming business-models and increasing their customer orientation. Various Fintech solutions are implemented by both large financial organizations and highly specialized Fintech companies that provide a limited list of services. This technological transformation of the financial market requires a change in approaches on the part of the regulator-the Central Bank of Russia

The following main goals of financial technology development can be identified [1]:

- promotion of competition in the financial market;
- improving the availability, quality and range of financial services;
- reducing risks and costs in the financial sector;
- ensuring security and stability in the use of Fintech;
- increasing the level of competitiveness of Russian technologies.

According to the Central Bank of the Russian Federation "Main directions of financial technology development for the period 2018-2020", the activities carried out and planned that contribute to the implementation of the national project "Digital economy of the Russian Federation" and other projects in the field of financial technology development.

The development of financial technologies in the Russian market involves the creation of a new digital infrastructure that will largely determine the financial market. All elements of the digital financial infrastructure are considered in terms of their significance in the market and the functions they will perform. The new digital financial infrastructure will consist of the following main elements [2]:

1. The platform-marketplace that allows increasing the convenience, transparency and efficiency of receiving financial services and products by clients. Also it is provided to eliminate barriers and reduce them to access to financial products and services in the market;

2. The platform for registering financial transactions that allows you to register transactions in the market and get information in a single register, access to which will be provided to all market participants;

3. The platform of Fast Payment that will allow you to make online transfers in the financial market in real time using various technologies (smartphones, QR code, and etc.);

4. Promising payment system of the Central Bank of Russia designed to ensure effective liquidity management by financial market participants and the ability to make urgent and non-urgent payments using specialized settlement services based on a single centralized infrastructure;

5. The national payment card system, which is the national infrastructure for processing Bank card transactions, ensuring the development of the Russian payment card system, uninterrupted internal transactions on cards of international payment systems on the territory of the country and the introduction of innovative services based on "Mir" card;

6. The system of financial message transmission, which will ensure guaranteed and uninterrupted transmission of financial messages using new technologies;

7. The unified identification and authentication system, as well as a biometric system, which will be an infrastructure that provides a multi-factor remote identification service based on information from the state information system and provides the ability to provide financial services remotely;

8. The end-to-end client ID, which is proposed to be used for various data sources stored at the place of their creation, which will allow providing various types of information about the client to interested bodies and organizations, including for providing financial services to them;

9. The platform for cloud services. A platform that will be an infrastructure solution that provides market participants with access to cloud resources of external providers (storage systems, applications and services) and allows market participants to host their own application services with the necessary requirements and conditions for information security;

10. The platform based on distributed Ledger technology, which will be a distributed system for storing and exchanging financial information and a trusted environment for its participants to implement financial services using Russian cryptography.

The key connecting element of the national financial market infrastructure is open interfaces (Open API), which use standard data exchange protocols.

The creation and development of a digital financial infrastructure will ensure effective provision of services in the financial market, including for small and medium-sized enterprises, which will increase the availability of financial services throughout the Russian Federation, as well as promote competition in the financial sector [3].

Thus, the digital financial infrastructure will define a new segment of the financial market – the virtual financial market, on the basis of which the digital profile is formed.

In this regard, as a summary characteristic of the financial market, the digital profile should be subject to research to determine the overall situation in the market, taking into account its features and specifics at all its levels: supranational, national and regional. This is necessary for the regulator to perform its functions and make effective management decisions, as well as for all participants in order to increase the ability to forecast market development in this area [4].

## **2 Results and Discussion**

The digital profile of the financial market is currently a loose concept and does not have a generally accepted definition, which makes it difficult to understand and interpret it. In order to define the concept of the digital profile of the financial market, the existing approaches to understanding its main elements were studied.

According to the draft law prepared by the Ministry of Communications of Russia, there is a concept of a digital profile of a citizen of a country or organization. In this case, a digital profile refers to a set of information about individuals and legal entities contained in the information systems of state bodies and organizations exercising separate public powers, as well as in the unified identification and authentication system [5]. The main goal of creating such infrastructure that provides access to the digital profile is the exchange of information between citizens, organizations, public authorities and local governments, which is one of the tasks envisaged by the national project "Digital economy".

Taking into account the fact that the digital profile of a citizen or organization is one of the elements of the digital profile of the financial market, the following definition can be proposed by analogy: the digital profile of the financial market is a set of information about the digital characteristics of each segment of the financial market, including Fintech, contained in various information systems, as well as in a single identification and authentication system. In this case, information about the virtual financial market is assumed

to be a set of specific indicators that include qualitative and quantitative digital characteristics of the market.

Analysis of the digital profile of the financial market by quantitative and qualitative indicators will help to form an understanding of the current state of the market and possible ways of its development. Based on this, the main user of information about the digital profile of the financial market is the financial market regulator – the Central Bank of the Russian Federation, which develops and makes decisions concerning the development of the country's financial market [6].

The analysis of the digital profile of the Russian financial market is currently conducted on two levels, so it can be presented as a hierarchical structure that includes:

- supranational level of the digital profile of the financial market (within the framework of the world Bank, EDB and EAEU methodologies);
- the national level of the digital profile of the financial market (within the framework of the methods of the Central Bank of the Russian Federation).

One of the significant areas of development related to digitalization processes is the "Digital agenda" of the Eurasian economic Union (EAEU), which includes the membership of the following States: Russia, Kazakhstan, Belarus, Armenia, and Kyrgyzstan. This digital agenda represents a range of topical issues for the EEU on digital transformation within the framework of integration development, strengthening the common economic space and deepening cooperation between the member States [7].

Within the framework of the digital agenda, directions for the development of the digital economy of countries have been identified, one of which is the digital transformation of the financial market, which involves the creation of a common digital infrastructure and digital platforms. In this case, the digital space of the EAEU forms a digital profile of the financial market at the supranational level.

The formation of the digital space of the EAEU is only at the initial stage of development, as plans for the implementation of the main directions of the digital agenda are defined until 2025. In this regard, the indicators of the digital profile, which are studied at the supranational level, are currently presented and fixed in the agenda only by target indicators for the implementation of financial market transformation processes [7]:

- share of exports of digital financial products and services in total exports;
- share of exports of traditional financial products and services rendered through digital channels in total exports;
- share of employed in the high-tech segment of the financial market;
- the share of the digital financial market of the Union member States in the GDP of countries.

Also, the research of the digital profile of the financial market at the supranational level is carried out by the Eurasian Development Bank (EDB) – an international financial organization that is a key element of the financial infrastructure in the Eurasian space [8].

As part of its activities, the EDB explores the prospects for digitalization in the countries that are members of the EAEU. In the financial sector, a number of specific indicators are studied, which are presented by the world Bank "Global Findex" [9]:

- number of open Bank accounts in the country;
- percentage of the volume and number of purchases made via the Internet using an open Bank account;
- the percentage of the country's population that uses a mobile phone or Internet to access a Bank account;
- the percentage of the country's population that receives payments from the state using digital technologies;
- the percentage of the country's population that has made or received digital payments.

Global Findex indicators are analyzed only at the level of the banking industry, which is more vulnerable to digitalization processes at this stage of development of the digital financial market. The analysis of the "Global Findex" indicators is based on the study of their dynamics and comparison of the indicators of the EDB member countries with each other, on the basis of which an opinion is formed about the nature of the dynamics of digitalization processes in the financial sector, the existing Laggards of individual countries in the field of market development and possible prospects for its development.

Thus, when studying the materials of the digital agenda of the EAEU and analytical reports of the EDB, it was determined that at the supranational level, the digital profile currently includes a limited list of indicators that are not able to reliably and most objectively reflect the real state of the virtual financial market.

At the national level, the digital profile of the financial market is studied as part of the activities of the Central Bank of the Russian Federation, one of which is the development of technologies and support for innovations in the financial market.

Indicators of the direction for the development of financial technologies and mechanisms of electronic interaction, identified during the study of the materials of the Central Bank, namely the annual report, are presented in table 1 [10].

**Table 1.** Indicators of the Central Bank on the development of technologies in the financial market [10].

<b>Indicators</b>	<b>Indicator characteristics</b>
The level of use of financial technologies in the financial market	- types of technologies used in the financial market.
Level of electronic interaction	- types of electronic interaction in the financial market; - the share of electronic document management in the General exchange of information.

The materials of the Central Bank of Russian Federation contain information about the developed system of key performance indicators for the implementation of the main directions of financial technology development in the financial market. In the process of implementing the main directions it is planned to achieve these target values of indicators:

- share of electronic document flow with financial market participants;
- the percentage of types of products and services available to consumers through remote sales channels.

The indicators presented above are a measure of the effective impact of financial technologies on the availability of financial products and services, which determines the importance of these indicators in assessing the state of the market and determining its characteristics.

As the digital financial infrastructure developed, the availability of financial products and services throughout the country will improve. The Central Bank has also developed a monitoring system and built the list of indicators for evaluation of results of realization of strategy. Strategy of increasing financial inclusion in Russia through the introduction of financial technology and market development has the period of 2018-2020 [1]:

- indicators of physical, price, range and mental access to financial services;
- indicators of demand for financial services for the population;
- indicators of demand for financial services for small and medium-sized businesses.

The system for assessing the results of the financial accessibility strategy for the Central Bank is an important tool for measuring progress in achieving the goals. And also it is

important tool for measuring progress of improving the level and quality of life of citizens through the use of financial market instruments.

Indicators for measuring the effectiveness of the implementation of the financial inclusion strategy are key indicators at the national level, structured according to priority areas of financial inclusion.

Thus, the analysis of the annual reports, together with the study of public materials of the Central Bank of the Russian Federation, allowed us to determine the indicators that are considered by the Bank in relation to the digital profile of the financial market at the national level.

Studying the digital financial activities of supranational organizations and Russian Central Bank, it was revealed that the analysis of the digital profile is based on indicators that can reflect the state and development of the market at the General and unified level of the country's market, which includes many markets in different regions. In this case, we are talking about the lack of consideration for the development of individual regions in the analysis of the profile under research.

Accordingly, the main idea of the authors' approach to the study of such a segment of the financial market as the digital market is to conduct a more detailed analysis. Therefore, it involves the study of the digital profile not only at the levels of supranational and national markets, but also at the regional level.

The importance of studying the digital profile of the financial market at the regional level is due to the existing uneven development of the country's regions. In this regard, there is a need to develop solutions and ways to implement them for the development of the financial technology market in a specific territory, taking into account existing differences and regional features.

Based on the identified indicators, which are researched at various levels in relation to the digital financial market, a system of indicators was developed for analysis in the region (Table 2).

**Table 2.** Indicators of the digital profile of the financial market in the region.

<b>Indicators</b>	<b>Indicator characteristics</b>
The level of development of financial infrastructure using financial technologies in the region's market	<ul style="list-style-type: none"> <li>- Types of financial technologies used in various fields of activity (payments and transfers, financing, capital management, etc.);</li> <li>- Number of platforms used and their types;</li> <li>- Variety of it solutions on the market;</li> <li>- Number and variety of financial and non-financial products offered through platforms and IT-solutions;</li> <li>- Number of partnerships of financial organizations with Fintech companies;</li> <li>- Volume of investments in Fintech companies.</li> </ul>
The level of use of financial technologies in the region's market	<ul style="list-style-type: none"> <li>- Number of transactions made using financial technologies (by type of transactions);</li> <li>- Number of operations performed and tasks solved (by the type of platforms and it solutions used);</li> <li>- Share of operations using Fintech out of the total of all operations in the financial market;</li> <li>- Share of financial products and non-financial services offered through platforms and it solutions to the total volume of financial products and non-financial services offered on the market;</li> <li>- Percentage of bank customers using mobile banking.</li> </ul>

The level of protection and control of the digital space (legal regulation of Fintech)	<ul style="list-style-type: none"> <li>- Number of digital technologies used in the financial sector with a status already defined in the legislation;</li> <li>- Share of Fintech in the market, with a legal status that is not fixed in the legislation;</li> <li>- Volume and level of requirements for organizing the use of financial technologies;</li> <li>- Existing risks;</li> <li>- Implemented risks: cyber attacks, system failures, fraud (reports of violations using Fintech).</li> </ul>
Availability of financial services and products provided through the use of financial technologies in the region	<ul style="list-style-type: none"> <li>- Cost of implementation of operations by means of platforms and IT-solutions for consumers;</li> <li>- Level of expenses for using it infrastructure for financial organizations (cloud storage systems, applications and services).</li> </ul>

The proposed indicators for analyzing the digital profile at the regional level were also based on the study of the functions defined by the Central Bank of the Russian Federation for the digital financial infrastructure: offering financial services and products to individuals and legal entities; registering financial transactions; online transfers between individuals and legal entities; expanding the list of payment services for the Bank; new liquidity management instruments; new data exchange technologies; creating financial services for market participants [2].

Thus, the system of indicators used by the Central Bank of the Russian Federation for studying the virtual financial market and analyzing the digital profile, which exists at the national level, as well as the system of indicators for the international Association of the EAEU, was supplemented with indicators for analyzing the digital profile for financial market research at the regional level.

The updated and presented system of indicators for analyzing the digital profile of the financial market at the regional level will reflect a more detailed and complete state of the national digital market, which will make it possible to make the most objective characteristic of it, taking into account regional features of development.

### 3 Conclusion

The article supplements the theoretical provisions concerning the processes of digitalization in the financial market, and it presents the author's formulation of the concept of "digital profile of the financial market".

In the process of researching the digital profile it was found that the supranational and national levels of digitalization of the financial market are currently being investigated and based on this identified 2-level structure, an additional level was proposed for research. The regional level, which is proposed for study as part of the national profile. In this regard, the hierarchical structure of the digital profile of the financial market was expanded and supplemented by the regional level, based on which the system of indicators of the digital profile of the region was developed and presented.

Thus, the article formed a methodological approach to the analysis of the digital profile of the financial market. The results of the research will allow us to conduct a detailed analysis based on the variety and features of the studied qualitative and quantitative indicators of digitalization. The results obtained can be used in the work of the Central Bank of Russia and other financial regulators at the national and supranational levels, as well as by any market participants to make appropriate decisions and forecast the market.

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