

Security of Digital Transformation of the Financial Market

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Abstract:

Successful digital transformation requires paying increased attention to security. Some of the world's largest companies have been victims of cyberattacks. Internet Protocol addresses, personal information and finance are constantly at risk. In the digital world content, corporate networks of the past no longer exist. Security must be built directly into all applications.

However, many companies delay the strengthening of their security systems until it is too late. According to Gartner, until 2020, 99% of vulnerabilities in operating systems have been known to IT security specialists for at least a year. This means that companies must first eliminate the existing vulnerabilities that they know.

According to some estimates, almost 85% of the participants in the financial market call digital transformation the main priority for the next 3–4 years, because they see in it not only cost reduction, but also the possibility of creating new business models, new communication with the client, and, in fact, new sources of income. Recently, the financial system of Russia has been catching up with the West in terms of digitalisation and now it is developing faster than Western markets. All this suggests the need for closer attention to ensuring the security of transformation processes taking place in the financial market.

Keywords: Security, financial market, transformation, digital economy, digitalisation of the financial sector, digital transformation, financial market security technologies.

I. INTRODUCTION

The debate about whether financial technologies (fintech) will replace banks is a thing of the past. It is

rather the issue of cooperation and joint projects. Distributed registries also are not going to replace the banking structure. The market has become more

cooperative. One can make more money from competition than from monopolies. Sberbank ceased to be a bank. It has already turned into a technology company.

Agile as a method for implementing project initiatives makes it possible to significantly accelerate the time of entering the market with one or another function, with one or another product. Five key technological innovations that will be in the spotlight are big data, artificial intelligence, biometrics, a digital profile, and cybersecurity solutions. Digitalisation of the economy and fintech solutions will have the following key consequences for the economy and society:

- digitalisation is the “destruction” of formal institutions by informal ones (in fact, classical institutions such as licence, control, contract, etc. are replaced with new technologically advanced solutions in the field of informal institutions, such as electronic smart contracts and other similar solutions);
- digitalisation, especially as exemplified by blockchain technology, is a verification system that can replace a number of traditional institutions performing this function (the basic immutability of information about an object makes it pointless to verify it at the stage of the final consumer/purchaser);
- digitalisation is the replacement of classical (legal) institutions by technological institutions (a smart contract instead of a contract, reservation of tokens as obligations instead of reservation of capital, etc.).

II.METHODS

The theoretical and methodological basis of the study was the work of domestic and foreign scientists on safety issues in the context of transition to new financial technologies, as well as laws of the Russian Federation. The source materials were reports of the Ministry of Economic Development of the Russian Federation, reports of the Central Bank of the Russian Federation, data from the Federal State Statistics Service of the Russian Federation, and materials of

original developments.

The study is based on a systematic approach that ensures the complexity and focus of the research. The work also used analytical, abstract-logical, economic-statistical, monographic and experimental methods.

III.RESULTS

In recent decades, the financial market of the Russian Federation has been developing at an accelerated pace, going through all the main stages of development in record-breaking time, which is due to the demands of the epoch. According to the results of the first half of 2019, the Russian stock market was among the leaders in growth among the world developed and developing markets. For 6 months, the MSCI Russia indicator showed an increase of 28%, getting ahead of the US and European stock indices, oil, gold, and USD. Amid a slowdown in the global economy, a weak dollar and a loss of interest in US Treasury bonds, investors are increasingly paying attention to emerging markets, and the Russian one is no exception.

According to the results of six months, the rouble strengthened by almost 10% against the dollar and became the strongest currency in developing countries. A favourable domestic and foreign environment is expected to help boost the Russian stock market in the second half of 2019. Market growth factors are a low fundamental valuation, high dividend yield, and the extension of the OPEC Plus transaction.

Despite the fact that the global economy is gradually entering the last phase of the business cycle, the signs of which are an increase in the likelihood of a recession and a milder monetary policy of the leading central banks of the world, investors have not yet lost their risk appetite. Against the background of internal contradictions in Europe and the overvaluation of the US market, developing countries look more attractive for investments in 2019. Due to the unique combination of high dividend yield and low fundamental valuation, Russian stock indices can

show better dynamics compared to the indices of developed and comparable developing countries.

The Russian market remains one of the most undervalued in the world, despite a significant increase in the financial performance of domestic companies in 2018. The fundamental assessment of comparable markets (for example, Argentina, Brazil, Taiwan,

Thailand, South Korea) is 10x-15x by the P/E multiplier, while for Russia, this indicator is currently at 5.5x. At the same time, the expected dividend yield of the Russian stock market by the end of 2019 will be about 7% per annum. No other market in the world provides such a combination of high returns and stock growth potential.

Table 1. The number of professional participants in the securities market and trading volume on stock exchanges, billion roubles [2]

	2014	2015	2016	2017
Number of professional stock market participants, units	1079	875	681	614
Trading volume on stock exchanges including:				
stocks	232,896.2	227,011.8	331,556.1	395,353.3
bonds	54,604.9	52,379.3	63,837.7	72,673.7
investment shares	149,276.6	149,003.4	234,470.6	296,194.0
futures contracts	177.3	196.5	33.1	124.1
including:	25,142.3	23,370.0	29,693.2	21,885.7
for stock indices	21,804.2	20,291.2	2,637.9	18,486.4
for securities	3,338.1	3,078.8	3,555.3	3,399.3
options	3,695.1	2,062.5	3,521.6	4,475.8
including:				
for stock index	3,644.8	2,002.3	3,434.5	4,440.4
futures				
for securities	50.2	60.2	87.1	35.4
futures contracts				

On September 6, 2019, at a meeting of the Bank of Russia Board of Directors on the issue of interest policy, it was decided to reduce the key rate by 0.25% – to the level of 7% per annum. This is the third consecutive decline.

In a commentary to the rate decision, the Bank of Russia noted lower than expected dynamics of economic growth, as well as “increased risks of a significant slowdown in the global economy”. Other things being equal, the preservation of such a situation

will play a role in the continuing softening of the monetary policy [3-9].

Inflation continues to decrease: in August, it amounted to 4.3% compared to the same period last year, while a month earlier – 4.6%. Given the actual dynamics of inflation, the Bank of Russia lowered its annual inflation forecast for 2019 from 4.2–4.7 to 4.0–4.5%.

At the same time, the Bank of Russia hinted that the mitigation cycle may be ended in the near future,

saying that at one of the next meetings, the Board of Directors “will assess the feasibility of further reducing the key rate”.

The value of the dual-currency basket amounted to 67.1 roubles per basket by the end of September 2019, decreasing by the end of the previous month by 3.6%. The rouble was strengthened by the growth of oil prices, which was the result of explosions at the Saudi refineries and the subsequent increase in tension in relations between the United States and Iran. On June 9, 2019, the Board of Directors of the Bank of Russia reduced the key rate to 7% per annum [1].

According to preliminary estimates, in August 2019, the current account balance amounted to about \$3 billion, which is about 2–3 billion less than in July 2019, and \$4–5 billion less than in August 2018. In August 2019, net capital inflows resumed: the balance of operations with capital and financial instruments amounted to about +2–3 billion dollars (with the exception of the influence of external borrowings of the Central Bank of the Russian Federation). Official foreign exchange reserves in August grew by about \$5 billion as a result of the purchase of foreign currency by the Ministry of Finance under the budget rule [10–15].

According to preliminary estimates, in 2019, net capital inflows to the Russian economy resumed. This is due, first of all, to a decrease in investments of Russian banks in foreign assets, which amounted to

about \$8 billion.

The balance of operations with capital and financial instruments amounted to approximately +2–3 billion dollars. For comparison: in July 2019, this balance was near-zero, and in August 2018 – negative (-5 billion dollars).

The increase in official foreign exchange reserves due to market operations in August amounted to slightly less than \$5 billion. They increased by approximately the same amount in July. As in previous months, this increase was mainly due to the purchase by the Ministry of Finance of the currency under the budget rule.

In September, the planned volume of repayments on the external debt of the corporate sector amounted to \$9.3 billion (the maximum value for the 3rd quarter of 2019). In contrast to the previous two months, a significant amount of payments on external debt (about 40% of the total volume of payments) accounted for repayment of obligations to affiliated creditors. In September, five Russian companies issued \$2.7 billion worth of Eurobonds in the primary Eurobond market in aggregate (not a single deal was recorded in July-August). In the international syndicated lending market, one Russian company attracted a loan of \$0.2 billion (in July-August, two companies completed transactions with a total volume of \$2.7 billion).

Table 2. Key indicators of the private pension system

	2014	2015	2016	2017
Number of non-state pension funds	120	102	74	66
Property to ensure authorised fund activities, million roubles	92,572.0	89,520.5	76,778.7	207,124.0
Capital and reserves, million roubles	50,669.1	70,828.4	103,946.9	154,421.7
Pension reserves, million roubles	900,094.6	991,607.8	1,096,759.6	1,057,977.9
Pension savings, million roubles:				
book value	1,128,945.2	1,707,146.2	2,114,609.3	2,374,164.8
market price	1,132,441.3	1,719,548.7	2,129,937.7	2,435,011.4
Number of participants, thousand people	6,366.7	5,806.7	5,280.9	6,007.8
The number of recipients of non-state pensions:				
total, thousand people	1,581.7	1,556.7	1,530.8	1,484.4
as a percentage of the total number of pensioners registered in the Pension Fund of the Russian Federation	3.8	3.6	3.5	3.4
Payments of pensions for non-state pension provision, million roubles	45,522.7	49,329.4	53,436.4	59,553.4

The broad monetary base by the end of August amounted to 16.4 trillion roubles. In August, banks received 176 billion roubles of profit after the formation of reserves and 250 billion roubles of profit before the formation of reserves (for comparison: in August 2018, banks earned 125 billion roubles of profit after the formation of reserves and 250 billion roubles of profit before the formation of reserves).

For the second month in a row, the money supply continued to grow: by almost 2% in August and by 4% in July. This contrasts sharply with the previous dynamics – the long-term trend of slow compression, which began as early as the middle of last year. The growth rate of funds on accounts and deposits of the population was -0.6% compared to the previous month after +0.3% a month earlier; +9.7% in annual terms. The growth rate of the retail loan portfolio compared to the previous month in August amounted to +1.8%

in the system as a whole and +2.0% excluding Sberbank (in July +1.2% and +1.1%, respectively); +21.2% in annual terms. The share of overdue loans in August decreased by 0.1% to a level of 6.9% (excluding Sberbank and VTB).

There is a decrease in funds in the accounts and deposits of enterprises. The monthly growth rate of corporate lending in August amounted to +0.7% for the system as a whole and -0.1% excluding Sberbank and VTB (in July +0.4% and 1.3%, respectively); +4.9% in annual terms.

In August, the average rate on short-term loans decreased by 0.22 percent relative to July – to 9.63% per annum; the rate on long-term loans decreased by 0.5 percent – to 9.06% per annum. The share of overdue loans in August fell by 0.6% to 12.9% (excluding Sberbank and VTB). In September, the

average value of the Moscow Exchange index increased by 4.3% compared to the average level in August and amounted to 2,789 points.

The trading volume in September was 946 billion roubles. The capitalisation of the stock market (shares included in the Moscow Exchange Index) in September averaged 10.5 trillion roubles, an increase of 6.2% from the average level in August 2019.

The growth rate of the portfolio of bank loans to the population increased. They amounted to +1.8% in the system as a whole and +2.0% excluding Sberbank (in July, these indicators amounted to +1.2% and +1.1%, respectively).

The decomposition of the currency structure of the dynamics of loans to the population shows that the growth was due to an increase in the issuance of rouble-denominated loans (+1.8%) with a decrease in foreign-currency loans (-1.2%).

The share of overdue debts in the debt of the population to banks is gradually decreasing. This is due to an improvement in the quality of servicing mortgage loans and unsecured consumer loans [16-23].

The financial market of Russia is young and dynamically developing. Transformation processes that determine current trends in economic development are most actively implemented in the financial sphere. All this causes an increased interest in the issues of ensuring the security of the ongoing changes.

Digital transformation in general and that of the financial industry in particular is one of the key challenges of the present and the near future. However, when the security problem of digital transformation of the financial market is discussed at different levels, as a rule, the problem is narrowed down to the issues of digitalisation of existing processes, without considering the appearance of new entities (including digital ones) and work with them, which, in the

authors' opinion, should – and will – bring paradigm changes, including in the financial market.

IV. DISCUSSION

The financial market has felt the greatest impact of digital transformation. Today, dozens of technological IT solutions are successfully used in the financial market at various management levels, from email to integrated C-suite development tools. In a big jump to advanced business, a large number of interconnected systems predetermine the presence of many obstacles along the way.

During each wave of new technical improvements, most organisations introduce demanding technologies. Each unit can use different systems for analysis, project management, prototyping, as well as other digital tools in their industry.

All this causes significant complications. Many systems stack on top of one another involuntarily reducing productivity. Monitoring and switching between systems to perform individual business functions overload employees.

To overcome this digital transformation problem, one needs to find ways to simplify and optimise digital systems. This does not necessarily mean getting rid of existing ones, but surely means integrating these systems.

The use of new tools means the adaptation of employees. This task of digital transformation emphasises the human factor of complex organisational and technical systems. A successful digital transformation requires effort to put the human experience in the spotlight of all processes.

The decision to invest in a new instrument is not made by chance. Without a genuine acceptance of this concept and the professionalism of employees, a leader cannot count on maximizing the potential of the digital assets [24].

Digital tools, as a rule, differ in the interface, functions, and methods of their use. It cannot be assumed that employees can independently use the necessary skills from their previous experience with similar platforms. Training and ongoing support is an important and integral part of digital migration and implementation.

Digital transformation is a more complex process than simply digitizing documents [25-31]. The task of digital transformation was originally to change the style of one's life and work, revolutionise it, make it digital. Employees who are used to spend a lot of time directly communicating with clients will now spend it on computers and use other communication methods that fundamentally change the workplace culture: teamwork, self-service, transparency, etc. At the same time, the natural human rejection of changes is a problem.

The problem of digital transformation in terms of culture is rethinking one's role. Someone who earlier just entered data can now become more valuable as an analyst.

Another challenge of digital transformation is to keep up with the latest technologies, and the flip side of the coin is to preserve the transformations that have occurred inside. Today, new problems have appeared: how to use artificial intelligence, machine learning and the Internet of things [32-45].

Agreeing that despite the development of fintech companies, banking and, especially, the financial market will not disappear, one can conclude that the reasons for the preservation and, as a result, the direction of transformation of the financial market will be different. The formation of financial (banking) ecosystems is already a reality today. However, in the authors' opinion, tomorrow one will see an increase in horizontal intersubjective interaction and the prevalence of informal institutions as their basis.

The challenges facing the financial market related to

the digitalisation of the financial industry itself are just a reflection and forerunner of the processes that will be observed over the next decade and which will much more deeply change the entire system of socio-economic relations [46- 52].

In the authors' opinion, the essence and meaning of changes and problems consists not only and not so much in the dispute between fintech companies and classical financial institutions as in the transformation of finance itself, which will begin (more precisely, it has already begun, but has not yet become so obvious) with the transformation of the functions of money and will affect at least the following elements:

- a change in the measure of value is one of the basic transformations that will lead to significant changes in the modelling of investment processes and the transformation of savings into savings and investments, and, in addition, to many other processes;
- the distribution of the functions of money by channels and types of money, the emergence and consolidation of new, previously not reflected functions of money and other financial instruments;
- an exponential increase in the number of cryptocurrencies and the transition from hype to focusing on those functions of cryptocurrencies as a conditional form of money that they can execute due to the presence of low transaction costs and other competitive advantages;
- the reaction of the financial market to the challenge of financing the transition to the fourth technological structure, which is especially important for transition economies;
- regulatory arbitration and its manifestation as one of the forms of work with costs and the basis for making decisions between the legitimisation of new entities and their regulation;
- a change in the structure of costs and, as a consequence, both the sources (carriers) and

beneficiaries of these costs;

- the emergence of new entities that will not only combine the functions of previously disparate entities but also serve as the basis or reason for building new socio-economic relations (at least their elements). The simplest example of such an entity can be a digital money-contract, which contains at the same time two, or even three previously differentiated circumstances of intersubjective interaction;

- the transformation of institutions and priority between formal and informal institutions, as well as the replacement of classical institutions with technological ones.

For the time being, people are trying to pack analogue thinking in digital clothing instead of moving to fundamentally new thinking through the awareness of the paradigm transformations that the world is on the threshold of [51-54].

V.CONCLUSION

The general development of digitalisation and the institutional changes it creates in the financial market require a more detailed interdisciplinary approach to a deep analysis of emerging trends. The financial market will continue to act as a provider and replicator to other markets for these changes, and is likely to raise new questions. However, in any case, those changes that one can already observe and those changes that are yet to come require taking into account at least three groups of costs, the presence and influence of which will largely determine the essential expediency of certain transformations:

- transaction costs, the transformation of which is not yet fully defined and not obvious, although it is clear that it will occur to a large extent;
- opportunity costs, by which the socio-economic feasibility and effectiveness of both changes and, in the particular case, technological innovations will be weighed;

- institutional costs, the consideration and description of which are still in the initial stage, but the categorical allocation of which will determine the possibility of a more accurate understanding of the arising redistributions.

Further research, which, in the authors' opinion, may be of interest, will develop both in the direction of the analysis of emerging new entities that will change the financial market, and through it other markets, and in the direction of identifying and assessing fundamentally new risks which the economy can encounter within 10-15 years and which may become points of bifurcation of the system, but today are not obvious and not predictable.

Thus, with the apparent increase in competition in the financial market, in fact, there is still greater monopolisation. The key controversial question is who the future belongs to: fintech companies or classical financial institutions (banks), and this question does not have a single solution. Even though banks will not disappear, they will not remain the same. The main trend is the development of further cooperation between fintech and start-up companies and banks, the formation of a banking ecosystem. The Central Bank of the Russian Federation as a regulator creates a "regulatory sandbox" and a marketplace, which serves as an important vector of digitalisation of the financial market.

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