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Synthesis of Socio-Economic Maps and Visualization of Deviant Activity Measures of Financial Monitoring of Entities

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ABSTRACT

The task analysis of the Federal Financial Monitoring Service has revealed that the money laundering risk assessment process is greatly limited by insufficient resources. The **aim** of the study is to increase the efficiency of decision-making processes by using visualization of financial monitoring data. The **methodological basis** of the study suggests to rank objects in order to map financial monitoring data. However, the objects of financial monitoring, such as business entities, professional securities market participants, have sets of characteristics, i.e. are of vector nature. As known, there is no mathematical definition of ordinal relations for vectors. The author used the **method** of principal component to estimate a scalar value of financial monitoring. The article provides a subject area modeling of financial monitoring, and the author used mathematical and methodological tools to map deviant objects of financial monitoring. The **result** of the study presents the geographical infographics of the money laundering process. The author refers to socio-economic regional maps obtained from various official **sources** (arbitration case files, the Unified State Register of Legal Entities, the crime rate in Russia from the Ministry of Internal Affairs). The maps include information about the business activity of the federal districts, regions with a propensity for illegal and legal financial activities, crime rate. The author **concludes** that the results of the study may serve as a powerful tool to support the strategic decision-making process and microanalysis of financial monitoring.

Keywords: decision making support; mapping; integrated assessments; deviant activity measures; financial monitoring; scientific visualization

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INTRODUCTION

Management efficiency in various sectors, in the field of public administration in particular, is largely based on objective assessment of the situation and quick response to changes.

The author considers the problem of assessing the situation on the example of the Federal Financial Monitoring Service (hereinafter referred to as "Rosfinmonitoring").

The Rosfinmonitoring is a main component of the state financial monitoring system in Russia — federal executive body responsible for combating money laundering and terrorism financing, public policy development, implementation of legal regulations and coordination of the activities of other federal executive bodies in this area[1].

According to the Federal Law No. 115-FZ "On Counteracting the Legalization (Laundering) of Criminally Obtained Incomes and the Financing of Terrorism"[2] Rosfinmonitoring receives messages from credit organizations about financial transactions of their customers, analyzes these messages, and then transfers the data to the law enforcement authorities of the Russian Federation, as well as in cases provided for by international agreements — to foreign financial intelligence units in order to combat money laundering[3].

An effective system to combat money laundering largely depends on its ability to timely identify trends and patterns in the activities of entities. To

[1] Decree of the President of the Russian Federation of November 1, 2001 No. 1263 "On the authorized body to combat the legalization (laundering) of proceeds of crime".

[2] Federal Law of 07.08.2001 No. 115-FZ "On Combating the Legalization (Laundering) of Criminally Received Incomes and the Financing of Terrorism".

[3] World Bank, Financial Markets Integrity Division. Financial Intelligence Bodies. International Monetary Fund. 2004. No. 2.

do this it is important to promptly receive objective assessments of the activities of business entities.

Traditionally, public authorities use an approach when experts consistently inspect one object after another. The results of such inspections are based on experts' subjective judgment [1, 2]. Besides, this approach is time-consuming and resource-intensive.

The increasing volume of incoming information (approximately 20% annually) leads to decreased efficiency when processing it. Decision-makers have to deal with missed deadlines and data based on subjective judgment.

The task analysis of Rosfinmonitoring has revealed that the money laundering risk assessment process is greatly limited by insufficient resources. This problem has to be addressed and considered as a priority.

A large amount of information and a variety of sources makes it impossible to evaluate and process data manually.

It is necessary to move from successive expert assessment of individual objects to automated collective evaluation process, considering modern methodological and instrumental approaches amid the digital transformation of public administration.

An important task of the decision-makers at Rosfinmonitoring is not only to reduce the response time to emerging threats but also to detect and suppress them on time. This area of analysis is of strategic importance for both financial monitoring and the national security system.

One of the ways to make inspections more effective is to visualize financial monitoring data.

Data visualization and visual analysis find their application in various sectors –industry and production, development and design, scientific research, public administration, and economics. Visual analytics provides a visualization of the phenomenon under consideration, helps to quickly catch the essence of the studied phenomena, and graphic images represent a natural and convenient means of interpreting the results [3–5].

The effective decision-making process in the field of financial monitoring consists of at least two components: the effective assessment of the situation at the tactical level, and the effective assessment at the strategic level.

The tactical component ensures the classification of individual objects of financial monitoring and assessment of the activities of groups of entities united by some common signs of financial activity. And strategic component ensures assessment of the situation at the level of territorial units of Russia.

Thus, the author proposes two approaches to visualization: assessment of the situation at a tactical level, based on the financial monitoring of individual objects; and assessment of the situation at a strategic level, based on the socio-economic mapping.

PROBLEMATIC SITUATION ANALYSIS

In the field of financial monitoring, analysts have to deal with a considerable amount of information. Statistics provides more details on these volumes.

According to the provisions of the Federal Law No. 115-FZ, the Federal Financial Monitoring Service receives information of about 100,000 financial transactions daily. It contains details of payers and recipients of funds, their accounts, and credit organizations.

As of January 2020, 3.7 million legal entities were registered in the Unified State Register of Legal Entities[4]. 286 organizations have a license to carry out brokerage activities, 314 have dealer licenses[5].

According to official information of the Central Bank of Russia, as of 01.01.2020, 442 credit organizations and their 618 branches carry out activities in the Russian Federation[6]. Bank statements contain hundreds of data fields.

In addition, the federal database of Rosfinmonitoring maintains its own accounting information for each credit institution with up to 50 data fields.

Also, the Federal Financial Monitoring Service compiles statistics for each type of object, and

[4] The Unified State Register of Legal Entities. URL: https://www.nalog.ru/rn77/related_activities/statistics_and_analytics/forms/8376083 (accessed on 24.01.2020).

[5] The register of brokers. Electronic resource. URL: https://www.cbr.ru/registries/ (accessed on 24.01.2020).

[6] Directory of credit organizations. URL: https://www.cbr.ru/banking_sector/credit (accessed on 24.01.2020).

additional identification information, such as addresses, data of identity documents, etc.

The departmental information of Rosfinmonitoring is enriched with data from various state registers, data on the foreign economic activity of entities, and tax information [6].

The visualization of assessments of identified entities solves the problem of primary identification of financial transactions.

Currently, methods of socio-economic mapping are widely used to visualize and analyze data in various fields.

The definition of mapping is given in GOST R 52438–2005[7] as a method of modeling, graphic, digital display of geoinformation, geospatial information "with an indication of its identifier, coordinate and attribute data". Another, broader interpretation of the term "mapping" is found in spatial studies. Mapping is defined as a method of modeling, visualization, graphic representation of any spatially localized information in accordance with the specified parameters in order to cognize the depicted phenomena [7–10].

Mapping is widely used in sociology, economics, philosophy, history, psychology to study pressing problems of territorial development and systematization, the visual presentation of information about the objects of study.

Socio-economic mapping as a scientific method dates back to the 1889 study of Charles Booth, who charted London's poverty[8]. This was followed by the work of researchers of the Chicago school E. Burgess and R. Park [11] on the territorial zoning of cities in relation to migration, urbanization, inequality, crime. The compilation of social maps was based on factual information collected through interviews, statistical observation, document analysis, which was then generalized and systematized.

The works of U. Teichler, I. Ferencz, B. Wächter serve as an example of socio-economic mapping put into practice. The works present a map of international academic mobility in Europe [12]. E.S. Kuzmina [13] provides maps of the exports and imports of the education services with quantitative indicators of the social process under study.

Another example of the social mapping method put into practice is found in the analysis of urban space and presented in the works of O.I. Vendina, N.N. Veselkova, K.P. Glazkova, N.D. Vavilina, I.A. Scalaban, K. Lynch, S. Milgram [14].

The study [15] focuses on the socio-territorial structure of Moscow with statistical data put on the city map, and the authors used a socio-statistical approach.

Thus, an analysis of the sources showed that socio-economic maps generally have one or two characteristics, quantitative one-dimensional data expressed in physical units — quantity, amount, etc. For example, the number of foreign students, or data expressed in a ratio — the ratio of resident to non-resident students.

At the same time, various industries, financial monitoring in particular, have tasks that require to display objects defined by a large number of characteristics. In other words, vector objects, which have no defined order relations.

In practice, there are situations in financial monitoring when ordinal relations between regions and constituent entities are important, and specific values of rating estimates are not.

To establish ordinal relations between regions, it is necessary to rank them. However, the objects of research are of vector nature and have sets of characteristics. As known, there is no mathematical definition of ordinal relations for vectors.

Thus, it is necessary to find a scalar function of the vector argument to solve the problem of data mapping in the field of financial monitoring.

Usually, the problem of finding a scalar function of a vector argument in various fields of human activity (politics, economics, sociology, sport, etc.) is solved by experts assigning weighting factors to vector elements. In other words, a weight vector in which the scalar product is the initial vector of the object's characteristics is selected, and the desired scalar estimate is generated. However, a subjective or politically driven judgment may impact this approach.

[7] GOST R 52438–2005 National standard of the Russian Federation. Geographic information systems. Terms and Definitions. Moscow: Standartinform, 2006. 26 p.

[8] Charles Booth online archive. Poverty maps of London. 2002. URL: http://booth. lse.ac.uk/static/a/4.html#v (accessed on 24.01.2020).

METHOD OF PRINCIPAL COMPONENTS

A comparative analysis of methods for reducing the dimension, convolution, and scalarization of vector indicators makes it possible to classify the method of principal components as promising [16–20].

The principal components method enabled us to synthesize integral estimates of objects of financial monitoring, regions, and federal districts. The obtained scalar values made it possible to rank them and served as a basis for visualization and mapping.

The most interesting indicators demonstrate maximum variability in passing from one object to another when dealing with practical and data processing issues.

At the same time, it is not obligatory to use characteristics directly measured for a particular object. Two artificial parameters can serve as an example — size and height when choosing clothes, instead of a tailor taking specific body measurements of a person. Although some of the information gets lost and coarsened, daily practice shows that such an approach gives quite acceptable results.

These prerequisites are fundamental in finding a linear transformation of the original set of indicators, which allows us to obtain principal components.

The method of principal components analysis is based on a linear model. Taking the number of analyzed objects for N, the number of parameters of objects for n, the mathematical model will be written as:

$$y'_j = \sum_{r=1}^{n} a_{jr} f_r,$$

where $r = 1, 2,\ldots, n$; $j = 1, 2,\ldots, n$; f — r-th main component; a_{jr} — weight of the r-th component in the j-th variable; y'_j — normalized value of the j-th attribute, known from observations or obtained as a result of the experiment.

FINDING AN INTEGRAL INDICATOR OF THE DEVIANT ACTIVITY OF BUSINESS ENTITIES FOR VISUALIZATION AND MAPPING

The Supreme Arbitration Court of the Russian Federation analyzes the financial and economic activities of a liquidated legal entity during bankruptcy procedure, with an absent debtor. The results of such analyses are given in court decisions.

Shell companies are usually established for certain operations. When a shell company fulfills its assigned role, it is simply "abandoned" without any liquidation procedures to the extent required by the applicable law. Thus, shell companies often fall into the category of absent debtors, and court decisions on their forced liquidation have indicators of shell companies.

The selection, analysis, and systematization of the decisions of the Arbitration Court of the Russian Federation made it possible to form a sample of legal entities that have features of shell companies.

The value of this sample is that it includes organizations classified as shell companies, based not on intuitive guesses of experts, but on confirmed evidence supported by court decisions.

According to the obtained sample, the variances of the main components and the correlation coefficients of the characteristics of economic entities with internal factors (principal components) are calculated on the basis of this matrix.

The interpretation of the projections of the source variables on the principal components (*Table 1*) proves that the second principal component is adequate from the point of view of assessing the situation in the industry.

Ten principal components (*Fig. 1*) describe the overall data variation.

Consider the second principal component. Part of the indicators correlates positively with it, another part — negatively. Wherein, features have a negative connotation.

Table 1 and *Fig. 2* show that the most important indicators that positively correlate with the second principal component are "lack of staff", "organization activity period" and "absence of non-current assets".

These are inherent characteristics of shell companies established to conduct suspicious financial transactions and cover illegal activities.

The second internal factor is negatively related to the indicators such as "lack of movement of funds in accounts", "absence of settlement ac-

counts" and "absence at address". These are typical signs of organizations being on the verge of bankruptcy, facing financial difficulties under adverse circumstances.

The higher the value of the second principal component, the higher the money laundering risks of the business entity.

INTEGRAL INDICATOR OF THE DEVIANT ACTIVITY OF PROFESSIONAL SECURITIES MARKET PARTICIPANTS USED FOR VISUALIZATION

The securities market plays an important role in a state's financial system and has its specifics. It is an attractive platform for money laundering, due to favorable trading conditions (for example, electronic bidding) and simplified process of international transactions. The securities market is a place to generate legitimate profit from money laundering.

Based on the federal financial monitoring database for professional securities market participants, the principal components variances and the characteristics' correlation coefficients of business entities with internal factors (main components) have been calculated.

The projections of the source variables on the principal components *(Table 2)* describe that the tenth principal component is adequate for the assessment process in the industry.

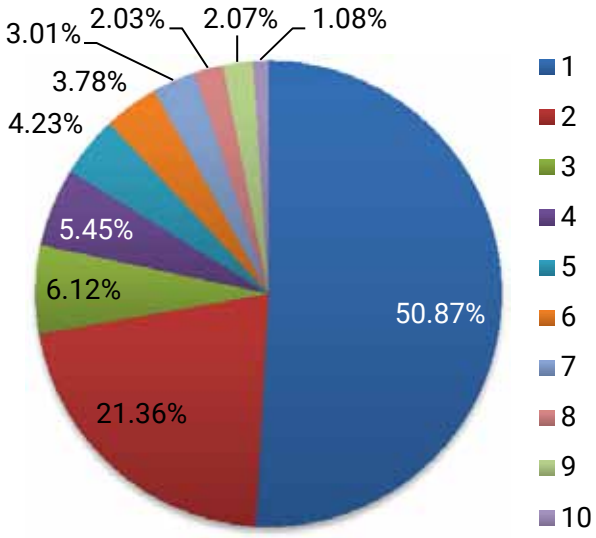

Fig. 1. **The total contribution of principal components to the total variance**

Source: compiled by the author.

Ten principal components describe the overall data variation (*Fig. 3*). *Table 2* presents calculations of factor loads — projections of the initial variables on each of the principal components.

The tenth internal factor is the most interesting. This factor corresponds to the deviant component, i.e. the securities market is vulnerable to the activities of money laundering.

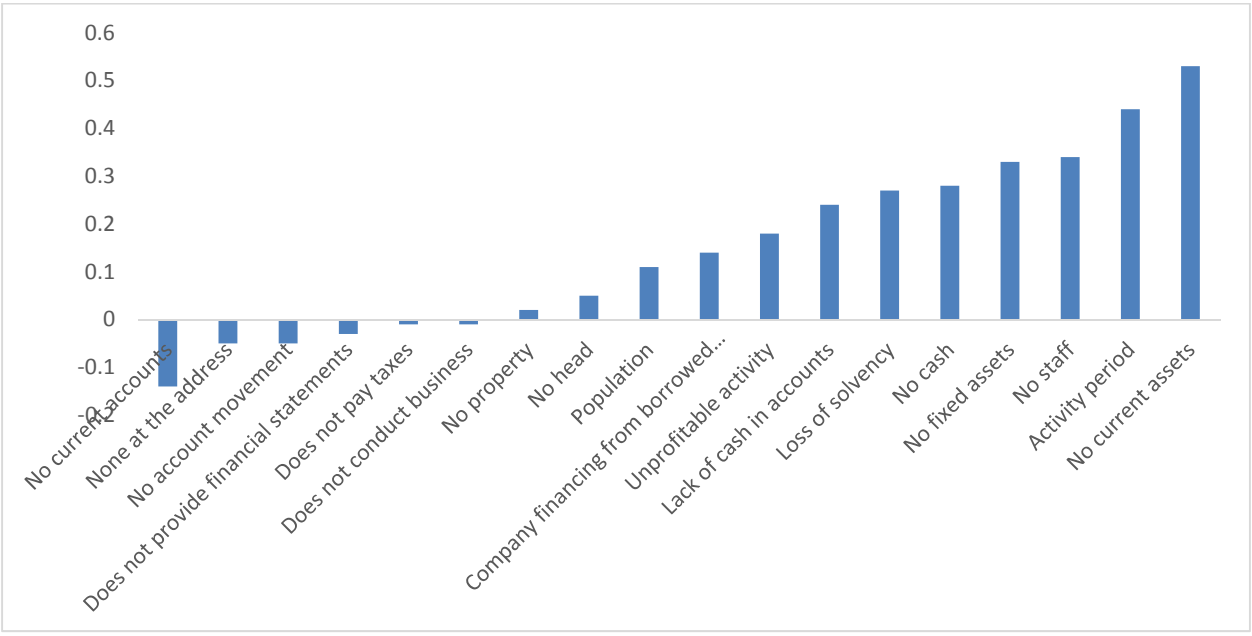

Fig. 2. **Correlation coefficients of the initial features and the second principal component**

Source: compiled by the author.

Table 1

Projections of the source variables on the new subspace

	Population	Does not pay taxes	None at the address	Does not conduct business	No property	Does not provide financial statements	No cash	No fixed assets	No current assets	No staff	Unprofitable activity	Company financing from borrowed funds	Lack of cash in accounts	Loss of solvency	No account movement	No current accounts	No head	Activity period	Contribution to the total variance in %
PC 1	0.02	–0.36	–0.36	–0.36	–0.35	–0.36	–0.03	0.03	0.04	–0.06	–0.12	–0.12	–0.16	0	–0.36	–0.34	–0.23	0	50.77
PC 2	0.11	–0.01	–0.05	–0.01	0.02	–0.03	0.28	0.33	0.53	0.34	0.18	0.14	0.24	0.27	–0.05	–0.14	0.05	0.44	21.32
PC 3	0.53	0.03	–0.03	0.02	0.07	–0.03	0.45	–0.24	–0.23	–0.28	–0.25	0.02	0.47	–0.08	–0.01	–0.12	–0.1	0.1	6.11
PC 4	–0.03	0.03	–0.05	0.08	0.1	0.07	–0.11	0.33	0.21	–0.46	–0.14	0.36	–0.15	–0.33	0.05	0.14	–0.48	0.26	5.44

Source: compiled by the author.

Table 2

Projections of source variables on a new subspace

	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10
Feature 1	0.37	–0.29	–0.38	–0.03	0.34	0.13	–0.06	0.59	0.39	–0.08
Feature 2	0.27	0.43	0.12	0.04	–0.11	0.57	–0.06	0.38	–0.46	0.18
Feature 3	–0.33	0.38	0.08	0.05	0.32	0.51	–0.17	–0.21	0.47	–0.30
Feature 4	0.44	0.07	0.16	–0.06	–0.56	–0.07	–0.54	–0.11	0.31	–0.23
Feature 5	–0.03	–0.09	0.67	0.55	0.26	–0.23	–0.19	0.28	0.06	0.07
Feature 6	0.40	–0.17	0.42	–0.11	0.01	0.19	0.62	–0.15	0.05	–0.41
Feature 7	–0.27	0.42	–0.09	0.14	–0.39	–0.28	0.38	0.48	0.21	–0.28
Feature 8	0.3	0.34	–0.18	0.05	0.43	–0.34	–0.15	–0.12	–0.34	–0.46
Feature 9	0.35	0.45	0.05	–0.09	0.16	–0.22	0.24	–0.17	0.39	0.59
Feature 10	–0.19	0.06	0.38	–0.81	0.16	–0.17	–0.15	0.29	–0.03	–0.03

Source: compiled by the author.

The obtained results reflected the subject area under consideration, and the securities market experts confirmed it.

VISUALIZATION OF THE INTEGRATED ASSESSMENTS OF ENTITIES' FINANCIAL MONITORING

The scientific visualization was based on the deviant activity measures of business entities, credit organizations, and the securities market participants.

Figure 4 shows a diagram of financial transactions.

The "house" icon indicates business entities, red circles indicate high-ranked subjects, and green circle — low-ranked subjects.

Thus, it is the first scientific solution to the problem of visualization of the measure of the deviant activity of entities: business entities, credit organizations, and professional securities market participants. The article explores and solves the problem of synthesizing measures of the deviant activity of entities' financial monitoring.

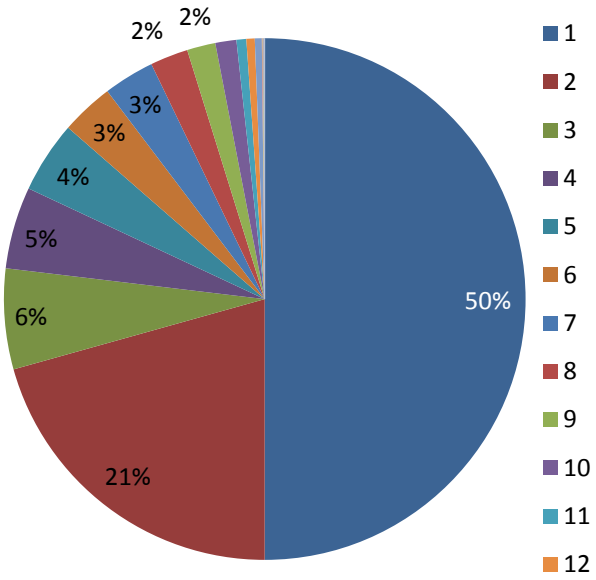

Fig. 3. **The total contribution of principal components to the total variance**

Source: compiled by the author.

A socio-economic map, based on the deviant activity measures of business entities, has been created. It reflects the money laundering situation in Russian regions (*Fig. 5*).

These are important results for strategic decision-making, with the main focus on problematic regions.

We study if this approach applies to other official data analysis.

RUSSIAN LEGAL ENTITIES DATA. BUSINESS ACTIVITY MAPPING

The Unified State Register of Legal Entities (hereinafter referred to as USRLE) provides information about Russian legal entities. The USRLE is a part of the Federal Tax Service of Russia, which contains information about registration, reorganization, and liquidation of Russian companies.

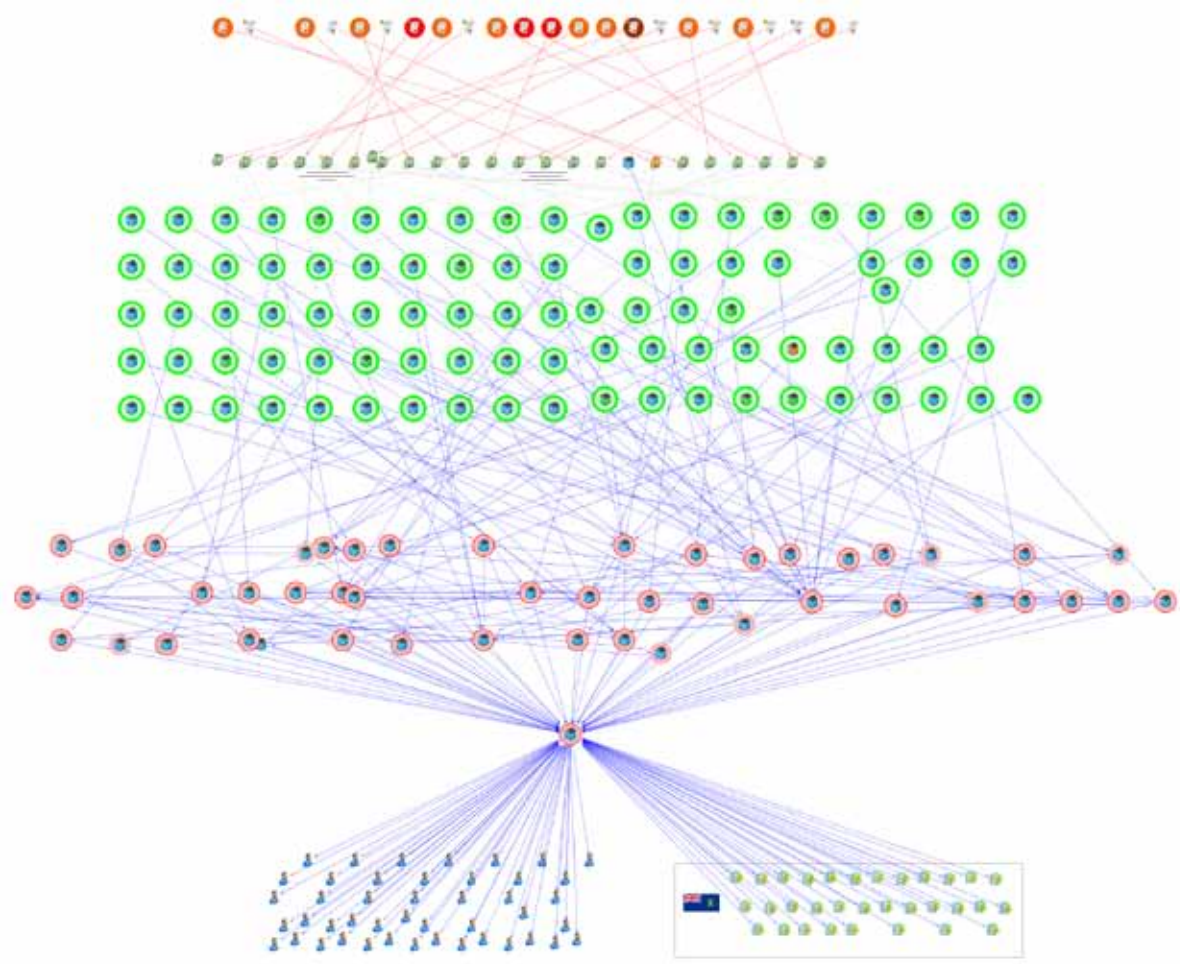

Fig. 4. **Financial transactions diagram**

Source: compiled by the author.

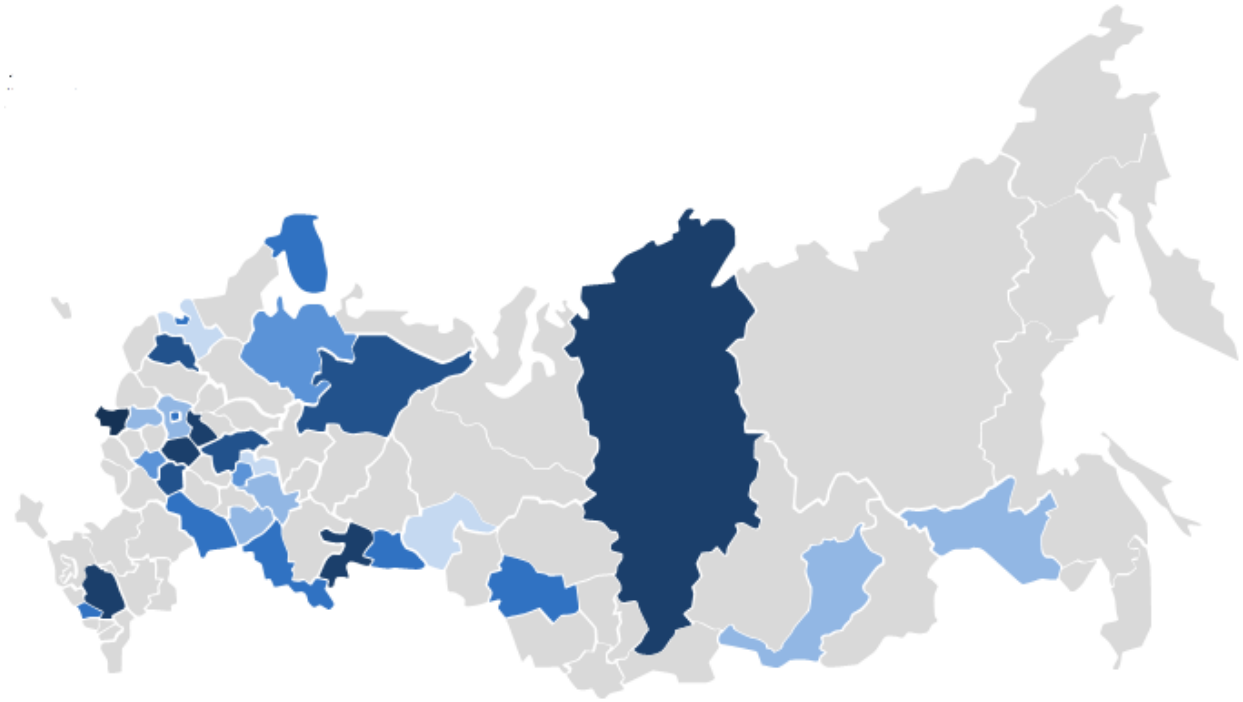

Fig. 5. **Mapping the propensity to legalize cash**
Source: compiled by the author.

We study the geographical component of this information by considering the legal entities' registration statistics.

We apply the method of principal components to the initial data.

We calculate the variances of the main components and the correlation coefficients of the indicators with internal factors (main components) based on this matrix. Six main components describe the overall variation of the data. The first two main components contribute 75% of the total variance. *Figure 6* presents a graphical illustration of the contribution of the internal factors to the total variance.

Consider the first major component. There is a negative correlation between the signs of "legal entities that have ceased their activity due to bankruptcy", "legal entities that have ceased their activities, total", "legal entities that ceased their activities by the registration authority decision" and "legal entities that ceased their activities as a result of liquidation".

In addition, a positive correlation is evident with the signs of "legal entities under reorganization", "legal entities that ceased their activities

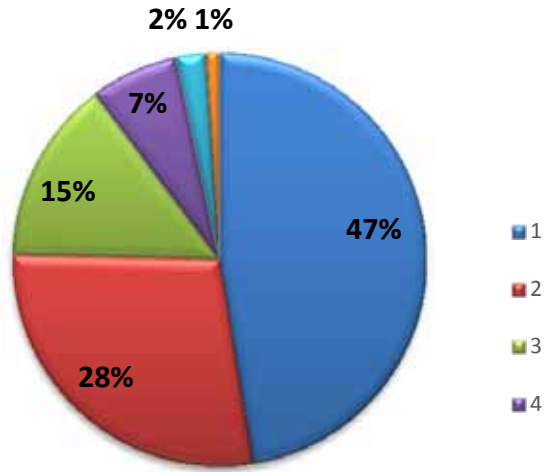

Fig. 6. **Total contribution of the main components to the total dispersion**
Source: compiled by the author.

as a result of reorganization", "total operating legal entities" and "total legal entities created". On this basis, we can talk about the bipolarity of the first principal component. The tendency to register new legal entities and reorganize previously registered ones is a positive sign of the factor. The tendency to liquidate organizations for various reasons is negative. The first major component reflects the business activity of the

Table 3

Correlation coefficients of indicators and principal components

Name of indicator, pcs.	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6
Total operating legal entities	0.4005	0.0383	–0.207	0.0622	0.0102	–0.21
Total legal entities created	0.3883	–0.001	–0.265	0.081	–0.09	–0.321
Existing legal entities formed by creation	0.3865	0.0003	–0.275	0.0716	–0.093	–0.317
Existing legal entities created through reorganization	0.1417	–0.086	0.5672	0.5852	0.1991	–0.301
Existing legal entities registered before 07/01/2002	0.3702	0.2021	0.093	–0.033	0.4433	0.3206
Legal entities under liquidation	0.2351	–0.361	–0.012	0.4817	–0.367	0.3827
Legal entities under reorganization	0.1218	–0.43	–0.303	–0.034	0.6885	0.1861
Legal entities that ceased operations, total	–0.212	–0.443	–0.215	0.0245	–0.072	–0.123
Legal entities that ceased operations as a result of reorganization	0.3897	–0.022	–0.025	–0.337	–0.338	0.2523
Legal entities that ceased operations as a result of liquidation	–0.176	0.296	–0.412	0.5083	–0.045	0.426
Legal entities that ceased their activities due to bankruptcy	–0.186	0.391	–0.378	0.1874	0.1221	–0.297
Legal entities that ceased their activities by the registration authority decision	–0.223	–0.444	–0.172	0.0136	–0.037	–0.171

Source: compiled by the author.

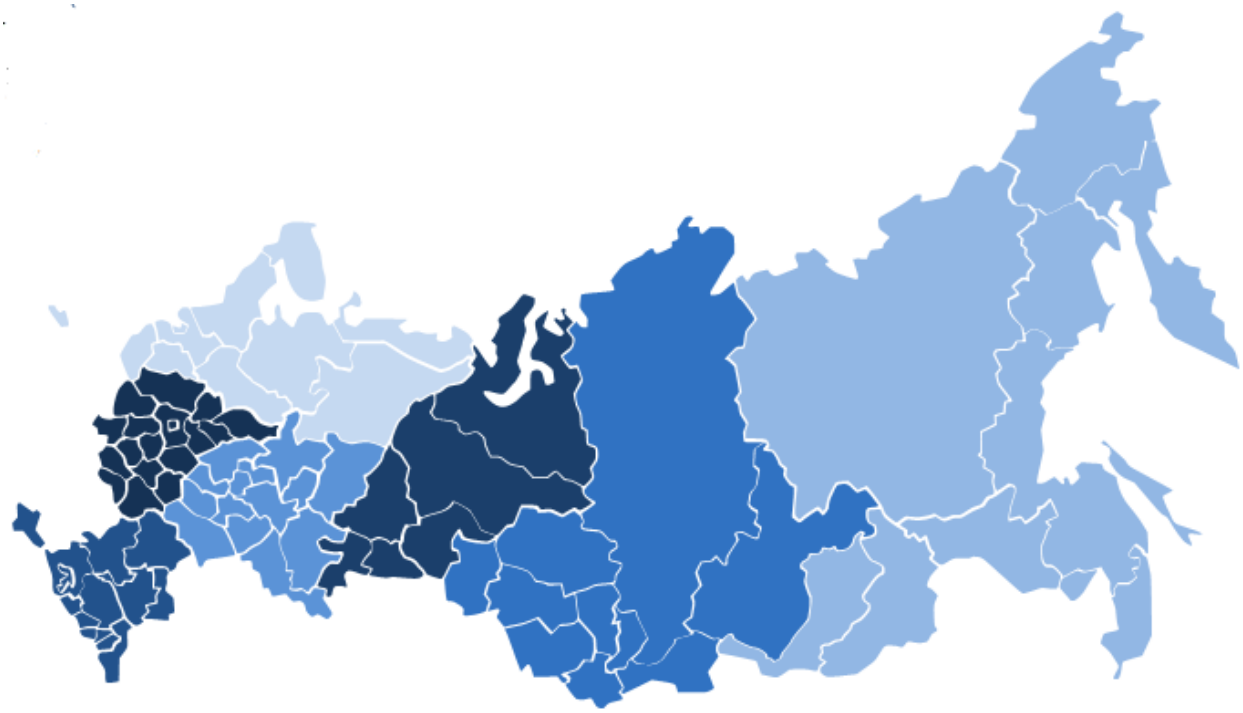

Fig. 7. **Mapping business activity of federal districts**

Source: compiled by the author.

Table 4

The value of the principal components for the federal districts

Federal District	PC 1	PC 2	PC 3	PC 4	PC 5
Central	2.262	–0.307	1.256	0.420	0.149
Northwestern	–0.065	–0.296	0.138	–2.083	1.292
Southern	0.103	–0.506	–0.558	–0.342	–1.278
Volga	0.793	1.066	–1.855	0.297	–0.314
Ural	–0.547	0.332	0.040	1.558	1.233
Siberian	–0.614	1.968	1.019	–0.589	–0.826
Far Eastern	–0.891	–0.060	0.247	0.527	0.858
North Caucasian	–0.184	–0.986	–1.011	–0.215	0.156

Source: compiled by the author.

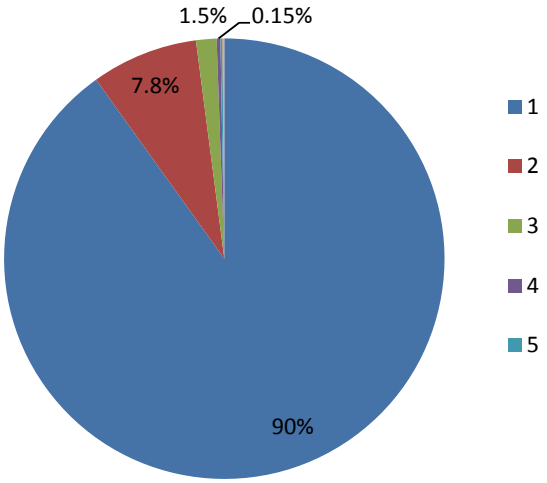

Fig. 8. **Total contribution of the principal component to the total variance**

Source: compiled by the author.

region. *Figure 7* shows the mapping of business activity in federal districts. A more intense colour represents higher values of the first principal component.

The inverse factor solution allowed to rank the federal districts according to the situation assessment and use the results for visualization purposes.

CRIME DATA MAPPING

The crime rate in the country is an indicator of the well-being of society and the quality of life of the population. At the same time, the state audit plays an important role in planning and conducting comprehensive control and supervisory measures.

In terms of national security mapping, scientific evidence requires an in-depth study of factors. The main component method was used to analyze official crime data of the federal districts (information taken from the official website of the Ministry of Internal Affairs of Russia). *Table 4* presents the values of the main components for the federal districts.

The pie chart (*Fig. 8*) represents the contribution of each component to the total variance. The first major component makes the biggest contribution of 90% and is an integral characteristic of the crime rate in the federal district.

Figure 9 shows the ranking of federal districts by the first main component — the more intense the color, the higher the value of the main component. The highest values are in the Central, Volga and Southern federal districts, and the lowest are in the Far East, Crimean, Siberian and Ural.

CONCLUSIONS

Two options are proposed to visualize financial monitoring information in order to assess the situation at the tactical and strategic levels. The problem of scientific visualization of the deviant activity measures for business entities has been solved.

The mapping process was based on the integrated assessments of the situation in the field

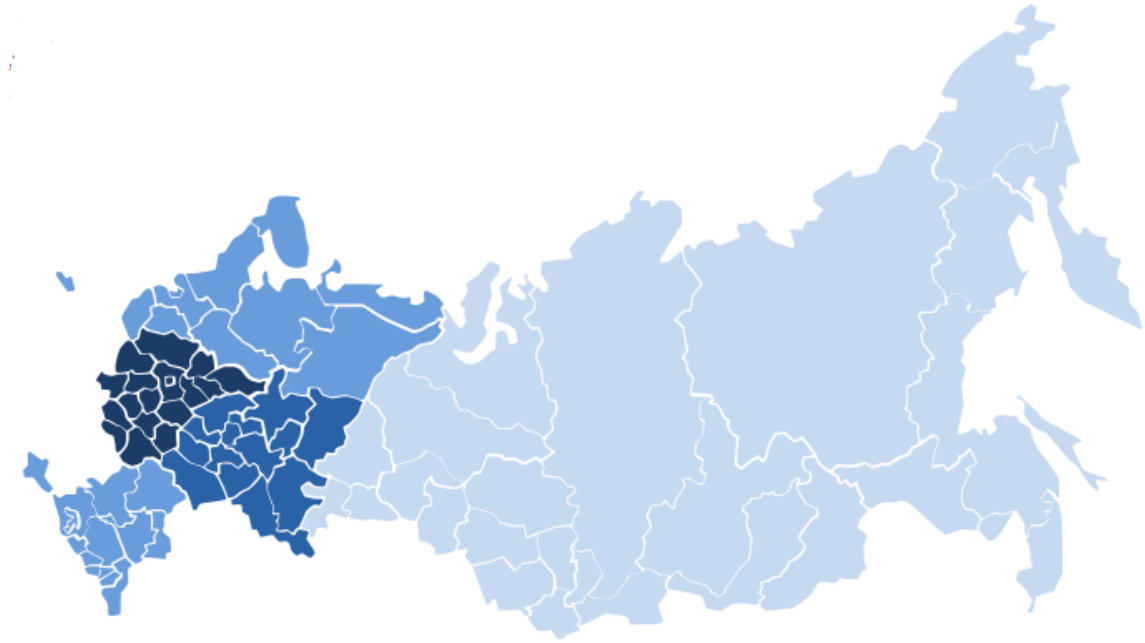

Fig. 9. **Crime mapping**

Source: compiled by the author.

of financial monitoring, the economic activity of regions, and the crime rate.

The visualization of the deviant activity measures provided the necessary information for decision-makers.

Thus, decisions about high-ranked entities should be made relying on financial investigations and information received from the law enforcement authorities.

In the case of low-ranked entities, decision-makers should take preventive measures aimed at suppressing negative trends and further situation development.

The proposed solution has significantly improved efficiency in identifying business entities' involvement in illegal activities.

As a result, the method of principal components applied to analyze data allowed to successfully rank regions, establish ordinal relations of the constituent entities of Russia in the field of financial monitoring, and create socio-economic maps.

The proposed method of presenting information in the field of financial monitoring should be used to solve related problems in other sectors of the economy.

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Digital Money at the Present Stage: Key Risks and Development Direction

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ABSTRACT

The article explores modern trends in the development of digital money. The purpose of the article is to identify and analyze the risks of digital money, and to study scientific approaches and tools for managing these risks. The authors use general scientific and special research methods, including comparative legal analysis and a systematization method, as well as methods of economic theory: positive analysis and scientific abstraction. The research highlights the strategic challenges and guidelines in the development of digital money in the Russian Federation and shows the difference and common features of digital and electronic money. Based on a comparative analysis of private and national digital money, we conclude that the digital money of Central Banks is more flexible and more reliable for consumers than private cryptocurrencies. We systematize the risks of digital money circulation at the micro, mezzo and macro levels, as well as identify the essential tools for managing them. The authors note that exogenous risk management tools are more typical for private cryptocurrencies, and endogenous tools will apply to digital money of central banks, in particular, the development of an appropriate configuration of Central Bank digital currency. The study may be useful for digital money users, as well as government agencies implementing policies and regulations on the issue and circulation of digital money in Russia.

Keywords: digital money; cryptocurrency; central banks; risks; banking system; payment systems

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INTORDUCTION

Money is a traditional item of any economic system. On the one hand, money performs economic functions, on the other hand, it is a social and legal category, subject of state power and regulation; on the third hand, money is an element of agreement and habits of economic entities that always strive to find a more profitable and convenient form of it.

The formation of digital money institution, which is also often called digital currencies, virtual money and cryptocurrencies, is a new evolving trend impacting the payment and monetary system transformation. In this context, digital money is viewed "as a combination of two elements: an asset and an exchange mechanism which allows payment and settlement through the use of distributed ledger technology" [1, p. 2].

The cryptocurrency market is rapidly growing. There are more than two thousand types of issued private digital currencies. So, the most popular of them are: Bitcoin (market capitalization is about 172 billion U.S. dollars), Ethereum (market capitalization is about 22 billion U.S. dollars), XRP (market capitalization is about 9 billion U.S. dollars), Bitcoin cash (market capitalization is about 4.3 billion US dollars), Litecoin (market capitalization is more than 2.8 billion US dollars)[1].

In some countries, there is a precedent for Central Banks to issue cryptocurrencies (for example, in Venezuela), and a number of other countries research the issue of national digital money, for example, E-Crona in Sweden [2] or Fedcoin in the USA [3]. Thus, national digital currencies issued by central banks appear along with decentralized private digital currencies [4].

Although digital money has been the main focus of scientific research in recent years [5–7], it is still understudied. In particular, there is no unified system to estimate risks of digital money circulation at various levels of economic processes. Also, scientific approaches and tools to manage these risks have not been developed, which creates obstacles for government agencies when regulating the circulation of digital money. This article studies the digital money development trends and associated risks.

PRIVATE DIGITAL MONEY (CRYPTOCURRENCIES): TYPES AND RISKS

Despite the ongoing technological and institutional transformation, the Russian ruble is an official monetary unit in Russia which is enshrined in law. At the same time, cash and non-cash (including electronic) forms of payment act as payment instruments, which are established by the legislation and rules of the Bank of Russia. From the point of view of payment instruments technology, electronic payment forms may ensure further development of the payment forms implemented by using digital technologies.

The peculiar feature of modern payment systems is that electronic money is used for settlement and payment, which, in fact, is an obligation that creates the illusion of a possible private issuance of such money.

F.A. Hayek described such use and feature [8, p. 177], and advanced the idea of private money circulation, not central banks' money. At the same time, it should be noted that legal and fiat value of assets ensure their status as means of payment and support their money function. The possibility of converting the state's digital money into real money makes it so attractive for investors.

This historical and social institution is currently undergoing a significant transformation. Most of the time mankind existed in a system of full money (commodity and metal). However, in recent years, monetary systems have significantly changed due to technological development which entails new risks in this process. Although the issuance of money is monopolized by central banks and government, there is a rising trend for private digital money (cryptocurrencies) formation and pay-

[1] Website CoinMarketCap. URL: https://coinmarketcap.com (accessed on 16.05.2020).

ment systems decentralization [9]. At the same time, we believe that such non-fiat digital currencies are not money in the full essence of this institution since the essence primarily depends on the functions performed. Currently available cryptocurrencies do not perform all the functions of traditional money and only serve as an interim payment alternative. However, in future, the fiat cryptocurrencies issued by central banks may lead to the development of new types of monetary systems with digital money widely used.

Currently, there are several thousand different digital currencies, which distinguish from each other by their characteristics, such as the issuance limit. As known, Bitcoin is the most popular cryptocurrency and it has an issuance limit. At the same time, Novacoin and PPCoin, for instance, have no issuance limit [10].

An important characteristic of cryptocurrencies may be privacy and anonymity, or conversely their absence. Both options are possible. Anonymity, however, is associated with money laundering risks. Also, cryptocurrencies can be created on the basis of complete (Bitcoin) or conditional (Namecoin, for example) independence. In this context, independent cryptocurrencies are entirely decentralized, while Namecoin is a controlled currency, where users get approved by ICANN, the US company-creator.

Another characteristic of cryptocurrencies that their creators can emphasize to distinguish from the general mass is security (the presence of any real asset-backed value) or insecurity. At the same time, it is more likely an advertising trick, since it is not possible to establish the real value. The most of cryptocurrencies are unsecured. It should also be noted that, by their purpose, cryptocurrencies are being used mainly as a payment instrument, however, they can also be used as platforms to finance projects and businesses.

It is important to point out that with the development and application of technology in society, specific risks increase. For instance, Internet fraud, viruses and malicious software, or even a simple breakdown of the equipment or its malfunction can lead to financial losses. Risks associated with the loss of information (cryptocurrency theft, cybersquatting) are considered as significant. So, "access to personal data is hardly controlled. In the future, hacking tools for devices that store confidential information will significantly improve so that they can become practically an "absolute weapon" [11, p. 64].

Thus, it is necessary to focus on identification and assessment of risks[2], that accompany the development and use of digital currencies in decentralized payment systems. Moreover, these risks will be different for consumers, the financial / banking system and for the state (*Table 1*). The table presented by the authors highlights the circulation risks of cryptocurrencies. Due to the short development and establishment period, official data have not yet been accumulated, and *Table 1* shows some examples of the implementation of risks.

According to the authors, *Table 1* presents the risks inherent of the circulation of private digital money, and possible forms of their manifestation, while it is noted that the risks are directed not only to a wide range of consumers and financial organizations, but may also undermine the systemic stability of the state economy. Therefore, the formation of new regulatory methods is required, which should consider and mitigate emerging risks. The problems of risks are addressed by Russian and foreign experts [13, 14]. At the same time, in order to successfully respond to the challenges of globalization, it is important to "to develop competition and move from the "economy of distrust" by abandoning strict legislative restrictions while tightening

[2] The term "risk" has many interpretations (including the Russian and international risk management standards), however, we use the concept that is given in the Federal Law "On Technical Regulation" dated December 27, 2002 No. 184-FZ, where it is stated that "risk is a probability of harm to be caused to people's life or health, natural persons' or legal entities' property, state or municipal property, the environment, the life or health of animals and plants taking account of the gravity of this harm".

Table 1

Private digital money circulation risks

Type of risk	Subjects at risk and scope of risk	Examples of risk
Liquidity risk	Customers: since systems are private they are not regulated by the state, as banking institutions. Once the transaction is confirmed, it is not possible to reverse it	In case of a transfer mistake, the user completely loses his money, as well as the possibility of keeping the funds invested in cryptocurrencies, since such investments are not insured and are not guaranteed. Example — Mt. Gox exchange, February 2014 "it closed without any explanation, which led to the loss of funds of its customers" *
	Financial/banking system: irreversibility/ irrevocability of the transaction	It is impossible to withdraw a transaction or challenge it
AML/CFT Risks	Financial/banking system: anonymity/ privacy — provides a possibility for money laundering and fraud	Customers of financial institutions may conduct illegal currency transactions, exposing credit organizations to reputational risks
	State: systems are autonomous and not regulated. Possibility to be used by criminals or persons belonging to terrorist groups	Criminals use cryptocurrencies to receive ransoms or payments for deliveries
Compliance risks	Financial/banking systems: the possibility of losses and penalties for illegal operations and doubtful transactions	The possibility of customer fraud exposes credit institutions to the regulatory sanctions. The complexity of identification procedures in financial institutions is growing
Legal risk	Customers: lack of legal status limits the scope	Illegal and illegitimate circulation makes it difficult to use in payments
	Financial system/banking system: limited use within a single payment system	The necessity to convert funds in different systems
	State: illegal and illegitimate status	At present, there is no legal framework for the use of digital currencies in civil circulation in Russia
Market risks	Consumers; financial/banking systems: volatility, investment risks	It is difficult to predict the movement of the digital currencies value since it depends on various factors: advertising, political and financial news, technical trends, and also, like any currency, it depends on supply and demand
Operational risks	Consumers, financial/banking systems; state: this risk is significant enough because there is a strong technical dependence for all the participants. It requires constant technological updating, as well as system improvement and integrity costs	All digital currencies are based on distributed ledger technology, which has many advantages, but at the same time is not perfect, and it must be considered. System crash: "for example, in August 2020 a major vulnerability in the bitcoin protocol was spotted, which let users create an indefinite number of bitcoins"*

Table 1 (continued)

Type of risk	Subjects at risk and scope of risk	Examples of risk
Systematic risks	Financial/banking system; state: high market risk may lead to a risk of liquidity loss of a systemically significant participant, which will lead to the need for government intervention	Digital currencies are a speculative asset and may become a crisis trigger because they lack real value.
Loss of state sovereignty risk	State: cross-border, volatility and anonymity triggers tax evasion, money laundering, terrorism financing and, as a result, state sovereignty problem	Private digital currencies are a non-state-controlled asset and can be used against public interests and undermine the sovereignty of the state
Deflation risk	State: limited issue may not correspond to the economic development of the state	According to Nobel Prize laureate P. Krugman**, cryptocurrency, Bitcoin, in particular, is not a generally accepted means of payment but is an element of a decentralized payment system. According to him, there is a threat of deflation, because, the number of bitcoins is limited by the amount of infinitely decreasing geometric progression, and the number of goods and services that can be paid with bitcoins will grow

Source: compiled by the authors.

Notes: examples indicated by * are taken from the source [12]; ** Website ttrcoin. URL: https://ttrcoin.com/pol-krugman-bitkoin-perecherkivaet-300-let-ekonomicheskogo-progressa.4344 (accessed on 16.05.2020).

control" [15, p. 20]. This idea may find support in the development of the financial sector digitalization since the use of cryptocurrencies by economic entities should be regulated by the state.

RISK MANAGEMENT OF DIGITAL PRIVATE MONEY CIRCULATION

In our opinion, there is a need for the state regulation of cryptocurrencies' circulation in Russia. However, the laws on digital assets and cryptocurrencies in Russia have not yet been applied, since the Russian regulators do not view cryptocurrencies as ecosystems in the same way. Thus, there is no official concept of digital money in Russia. It should be noted that the term "cryptocurrency" is not legislatively fixed in Russia, and there is a project to introduce the term "digital financial asset" into public circulation.

At the same time, cryptocurrencies exist and this fact cannot be denied. State legal regulator seems to be one of the most essential tools to mitigate the risks identified by the authors in the *Table. 1*, it also shows the "maturity" of the economic and legal system of the state.

We will analyze the legal infrastructure surrounding cryptocurrencies in different coun-

tries[3]. In 2014 only about 40 countries used some elements of regulation of operations with digital assets, and 5 years later 130 jurisdictions have their regulatory acts on this issue. This growth supports the authors' opinion about the need for legal regulation.

An analysis of how various countries apply a legal framework to the cryptocurrency market helps to develop optimal regulatory policies and practices. One of the facts is the variety of definitions used, which at the same time describe the same objects. For example, some of the terms used by countries to reference cryptocurrency are: in Thailand, Argentina, Australia they use the term "digital currency"; in China, Canada, Taiwan the term "virtual commodity" is used; the term "cyber currency" is used in Lebanon and Italy, and in Germany — "crypto-token"; while in Switzerland they use a "payment token"; Mexico — "virtual asset"; "electronic currency" is used in Colombia.

It should be noted that regulatory authorities in all countries understand the possible risks of using digital currencies. Regulators in various countries educate citizenry about opportunities that cryptocurrencies create for money laundering and terrorism financing. In addition, the Group for the Development of Financial Measures against Money Laundering (FATF) developed recommendations that summarize the current practice of the circulation of digital financial assets[4]. Some countries (for example, Australia and Canada) have already extended their laws on money laundering and counterterrorism, and warned about possible risks. These jurisdictions consider cryptocurrency markets as facilities that require control and have identified due diligence requirements for banks and other financial institutions that operate in designated markets. Regulatory institutions in some countries such as Belgium, South Africa and the United Kingdom issued notes for the public about the pitfalls of investment in the cryptocurrency markets, and have also found the size of the cryptocurrency market as too small to cause serious concern and to justify regulation and/or a ban at this stage.

Some countries regulate cryptocurrency as a mechanism to raise funds (ICO[5]). Of the jurisdictions that address ICOs, some (China and Pakistan) ban them altogether, while most tend to focus on regulating them. Most jurisdictions do not recognize cryptocurrencies as legal tender; however, they see a potential in the blockchain technology. Developing a cryptocurrency-friendly regulatory regime, these countries use cryptocurrencies as a means to attract investment in technology companies (Spain, Belarus and Luxemburg). Some countries approach this differently and develop their own system of cryptocurrencies (the Marshall Islands, Venezuela and Lithuania). One of the many questions that arise from allowing investments in and the use of cryptocurrencies is the issue of taxation. Since gains made from mining or selling cryptocurrencies are categorized as income or capital gains they are subject to tax. However, there is also no unity of tax regulators in this matter.

Thus, the presence of different jurisdictions and points of view gives rise to the problem of creating complete and consistent rules to regulate the circulation of digital financial assets, which would consider the requirements of national laws and business customs.

Based on the study and brief analysis of the possible areas and types of cryptocurrency regulation, we note that financial investments may create significant risks for investors (market, state, legal). At the same time, we believe that citizens have the right to manage their own legally earned funds independently, without any restrictions.

[3] Regulation of cryptocurrency around the world. The Law Library of Congress, Global Legal Research Center. 2018. URL: https://www.loc.gov/law/help/cryptocurrency/world-survey.php (accessed on 16.05.2020).

[4] FATF (2019). Guidance for a Risk-Based Approach to Virtual assets and Virtual Asset Service Providers. URL: https://www.fatf-gafi.org/publications/fatfrecommendations/documents/guidance-rba-virtual-assets.html (accessed on 05.06.2020).

[5] ICO (Initial coin offering) uses cryptocurrency as a mechanism to raise funds.

In our opinion, at the initial stage of developing regulatory standards in Russia, it is reasonable to build digital currency regulation based on the organizational principles of the existing currency regulation in Russia (the norms of the Federal Law "On Currency Regulation and Currency Control"[6]). According to these principles, operations with foreign currencies are limited, although economic entities are entitled to buy and sell foreign currency without restrictions and have any number of accounts in foreign currency opened with Russian banks. At the same time, payments in foreign currency are banned, except cases stipulated by this law. There is a threshold amount of funds over which identification of persons performing a particular transaction with foreign currency is required. Also, according to the by-laws, the regulator determined the requirement for credit institutions to comply with measures to manage currency risks — established standards for compliance with open currency positions [16].

To manage identified risks in Russia within the legislative framework, it seems essential to focus on the regulation and licensing of crypto-exchanges and other financial intermediaries in order to prevent possible criminal activities, as well as minimize operational and information risks.

The option of the issue of digital money by central banks seems more effective, more predictable with less negative effects for consumers, in the context of money digitalization. However, even this way of developing money digitalization requires appropriate legal and methodological tools.

CENTRAL BANK DIGITAL CURRENCY AND ITS IMPACT ON MONEY DIGITALIZATION

Digital currencies can be private and national (owned by the central bank). In the latter case, the central bank or another state institution with monetary functions issue them. IMF economists define central bank digital currency as "a new form of money, issued digitally by the central bank and intended to serve as legal tender. It would differ, however, from other forms of money typically issued by central banks: cash and reserve balances. Central bank digital currency designed for retail payments would be widely available" [17, p. 7].

The concept of direct access to central bank accounts from a wide range of individuals (deposited currency accounts) was introduced by Nobel laureate D. Tobin in the mid-80s. last century [18, 19]. Although the concept of D. Tobin was recognized in the academic environment, it did not find its practical application at that time. In recent years, the development of new financial technologies in the payment industry led to the launch of successful projects in the field of private digital money (Bitcoin, etc.). The authorities of several countries desired to completely abandon the use of cash, and the concept of giving access to households and firms to accounts opened directly in central banks has become relevant in the practical field.

Today there are no successful examples of issuing digital money among central banks of developed countries. However, there are pilot projects to create them and the closest to the release of digital currency is China, Sweden and South Korea.

Developing countries are more proactive in issuing national digital money. Venezuela attempted to issue a national digital currency in 2018 but failed. Also, Senegal, Uruguay and Tunisia announced the release of their own digital money. In Russia, the Central Bank is currently exploring the possibilities of digital currency launch[7].

According to the survey conducted by the Bank for International Settlements 63 central banks (of which 41 are located in emerging

[6] Federal Law of December 10, 2003 No. 173-FZ (as amended on August 2, 2019) "On Currency Regulation and Currency Control". URL: http://www.consultant.ru/document/cons_doc_LAW_45458/ (accessed on 16.05.2020).

[7] Central Bank is researching digital currency. URL: https://www.rbc.ru/rbcfreenews/5d04ccb69a7947da3eacd621 (accessed on 18.05.2020).

Table 2

Forms of Central Bank digital currencies

Who can use central bank money/ Used payment and cash flow technologies	A wide range of users (households and companies)	Banks and other financial intermediaries
Based on traditional technologies of interbank settlements on correspondent accounts	Funds on special accounts of individuals and legal entities opened with the central bank	Funds on correspondent accounts of commercial banks opened with the central bank (central bank reserves)*
Based on distributed ledger technology	Central bank digital tokens for individuals and legal entities	Central bank digital tokens (financial intermediaries only)

Source: compiled by the authors based on materials of Bank for International Settlements.

Note: * The concept of Central Bank digital currencies is not well-defined. Some researchers do not include central banks' traditional reserves (commercial banks' corresponding accounts) in Central Bank digital currency definition. See, for example, [17, p. 7].

market economies) mentioned the following motivations for issuing central bank digital currency: 1) payment efficiency (domestic); (2) financial inclusion; (3) payments safety; (4) others; (5) financial stability; (6) monetary policy implementation; (7) financial efficiency (cross-border)[8].

Payment safety and financial stability are priorities for central banks of advanced economies, whereas payment efficiency and financial inclusion are for central banks of emerging market economies. At the same time, the use of central bank digital currency for monetary policy implementation is not a priority neither for central banks of advanced economies nor for central banks of emerging market economies.

We distinguish between token- or account-based forms of central bank digital currency. Each of these forms is available for financial intermediaries (wholesale purpose) or individuals or legal entities (general purpose) (*Table 2*).

Token-based central bank digital money depends on a person receiving a token to verify that the token is genuine in order to prevent digital counterfeiting. To a certain extent, central bank digital tokens are similar to private cryptocurrencies and serve as an alternative to cash, as they can be transferred directly between users without a central counterparty, which ensures the confidentiality of transactions.

It is essential to identify the account holder of money in the form of entries in special accounts opened with the central bank, due to the possible unauthorized transfer or withdrawal of money from the account without the permission of its owner. This form of central bank money is similar to the money stored in accounts in commercial banks.

[8] BIS (2019). Proceeding with caution — a survey on central bank digital currency. BIS papers. No. 101. URL: https://www.bis.org/publ/bppdf/bispap101.pdf (accessed on 18.05.2020).

RISKS OF CENTRAL BANK DIGITAL CURRENCY CIRCULATION

Although the Central Bank acts as the issuer of digital currency, this form of money also incurs certain risks for users/consumers, the financial/banking system and the state. However, the nature of risks and their potential impact will differ significantly from the risks of private cryptocurrencies (*Table 3*).

The key risks for **users** will be: cyber risks — the threat of loss of funds due to hacking of the system; operational risks — failures in the system, leading to the loss of user data. The rest of the money of the central bank is safe for users. There are no market fluctuations and credit risks, since the probability of bankruptcy of the central bank, and hence its failure to fulfill its obligations, is very low. In this case, central bank digital currency is safer for users than private digital money.

The potential impact of central bank digital money on the **financial system** is estimated by economists as significant, despite objective difficulties in the current risk assessment process [20, p. 22]. Although, the digital currencies of central banks are intended to replace cash in the future, they can compete with deposits of individuals and legal entities in commercial banks. If households and companies had a possibility to open accounts directly with the central bank, it would lead to financial instability and an outflow of funds from commercial banks to central bank accounts (or tokens). The outflow of funds will negatively impact the liquidity of commercial banks and prevent them from performing the functions of financial intermediaries.

The second significant negative impact the central bank digital money entails is the potential decrease in the profitability of commercial banks due to the loss of customers, as some of them will prefer to use services of the central bank rather than private credit organizations. Consecutively, banks will lose some of the commission income.

In addition, banks will have to bear additional interest expenses on deposits to keep customers, as customers may prefer safe central bank accounts to current accounts and accounts with commercial banks. As a result, the central bank digital money entails more significant risks for the banking system than private digital money.

There are also certain risks for the **state and the financial regulator** due to the issuance of digital money: reputational and strategic[9]. Introducing new elements into the central bank's operation is always risk-bearing. Expanding the areas of responsibility regarding the increase of the customer base will require the organizational restructuring of the work of the regulator, and possible failure of the system may lead to reputation costs for both the regulator and the state[10].

A number of economists, along with new opportunities central bank digital money may offer, note potentially negative effects on the monetary policy of central banks [21]. During periods of financial instability, the outflow of funds from banks into reliable central banks (de-funding) may lead to the liquidity of commercial banks and prevent them from fulfilling the functions of financial intermediaries. This could have profound implications for monetary policy.

Also, it is important to develop requirements for anti-money laundering system if the central bank issues money in the form of digital tokens. Obviously, the token-based digital money of central banks provides a certain level of anonymity and privacy of users, which

[9] Strategic risk — "the risk of failure to achieve the objectives of the activity, improper performance of the functions of the Bank of Russia due to errors (deficiencies) in the adoption of decisions that determine the strategy and activities of the Bank of Russia or their untimely adoption, due to non-accounting (insufficient accounting) or untimely response to external factors threatening the price and financial stability of the Russian Federation". URL: https://cbr.ru/content/document/file/36486/policy.pdf (accessed on 18.05.2020).

[10] Legal issues/legal status of the currency. In many countries, including Russia, the work of central banks is limited by law. Central banks do not work with a wide range of customers, except in exceptional cases.

Table 3

Risks of Central bank digital currencies circulation for a wide range of users

For consumers/users	For financial/banking system	For state/regulator
Cyber risks — loss of money due to theft and unauthorized interference by third parties	Risk of liquidity loss by credit institutions	Reputational and strategic risks of the central bank
Operational risks	Loss of fee and commission income for credit institutions	Possible efficiency loss of the monetary policy of the central bank
Other risks	Interest expenses increase for credit organizations	The potential use of money to launder proceeds of crime (for anonymous forms of payments)

Source: compiled by the authors.

will come into conflict with the recent global trend of combating money laundering and terrorist financing.

To sum up at this stage, central banks have the necessary technological resources to issue their own digital money for a wider public. Meanwhile, potential significant risks for the financial system and the regulator itself[11], keep central banks from moving forward, although some central banks are testing their own digital currency.

Next, we consider how central banks can reduce the negative impact of their digital currency on the banking system.

DEALING WITH NEGATIVE IMPACT OF THE CENTRAL BANK DIGITAL CURRENCY ON THE BANKING SYSTEM

The development of the legislative framework for private digital money circulation is the key risk management approach. The state either completely ban private digital money circulation or introduce a policy that protects consumers from excessive risks [23].

However, different risk management approaches should be applied to central bank digital currency. This is because central bank digital money is safe for users who have a reliable alternative to commercial banks deposits. At the same time, risks arise at higher levels (mezzo and macro levels). Therefore, the legislative framework will take a second place here, and endogenous mechanisms of configuration (characteristics) of the digital currency will enter the scene. Central banks can mitigate the risks to the banking sector by varying the configuration of the digital currency.

Economists of the Bank for International Settlements identify 5 design features of central bank digital currency:

- availability;
- anonymity;
- transfer mechanism;
- interest-bearing;

[11] An ill-conceived approach to issuing central bank digital currencies may also have a negative impact on the real sector of the economy, although much depends on the method of issuance of digital currencies. See more [22, p. 95].

- limits or caps[12].

These design features of central bank digital currency ensure a flexible approach to the development of its own digital currency, limiting, if necessary, the risks of its impact on the financial sector of the economy.

We consider three basic tools for reducing the risks of central bank digital currency circulation on the financial system.

1. Negative interest rates. Amid instability, economic agents may prefer reliable central bank digital money, refusing commercial banks' deposits. In order to prevent the de-funding of commercial banks, the digital currency issuer can lower the interest rate to zero, or, if necessary, take interest rates into the negative zone. Thus, individuals and legal entities will bear certain costs and will prefer to keep their funds in commercial banks' accounts.

2. Limits on the maximum amount of digital money on the user's balance. If negative rates do not help, the central bank can set a limit on a user's balance. The lower the limit, the less the potential impact on the financial system. After all, the owner of the funds will be able to place only a small part of his savings in the central bank.

3. Limited access for users. Given the significant risks of issuing central bank digital money for a wide range of users, it is reasonable to consider the possibility to limit access exclusively by commercial banks and other financial intermediaries. The Bank of Canada's CAD-coin is an example of a digital (crypto) currency, which was introduced for the domestic interbank payments' settlement[13]. It is based on the distributed ledger technology. The largest Swiss bank UBS introduced a similar project of a token-based international payment system for banks and fintech companies based on private digital money — Utility Settlement Coin[14]. This new form of central bank digital currency for financial institutions do not carry risks of digital money for a wide range of users, as access to digital money will be limited exclusively by financial intermediaries and does not violate the traditional principles of their work.

CONCLUSIONS

1. The article highlights two current trends of money development — the rapid growth of private digital money (cryptocurrencies) and gradually evolving digital currency of central banks. Payment efficiency and financial inclusion are the key motivations to issue central bank digital currency for developed countries.

2. At the same time, each of the new forms of money has its specific features and unique risks for consumers, the banking system and the state. Thus, private digital currencies incur risks for consumers and the state. In case of central bank digital money circulation for a wide range of users, the risks of financial intermediaries are more significant, since they compete with commercial banks' deposits. Consecutively, this may lead to de-funding of commercial banks amid financial instability.

3. The authors classified types of risks of private and central bank digital currency circulation and provided economic and legal tools to mitigate those risks. It is essential to use tools that will reduce the influence of central bank digital currency on the banking system.

4. The authors concluded that the Bank of Russia may launch a digital currency project for credit institutions, similar to the Bank of Canada to start with. This approach lacks significant risks for Russian banks and at the same time may be a foundation to start a national digital currency project for a wide range of users in future.

[12] BIS. Central bank digital currencies. 2018. URL: https://www.bis.org/cpmi/publ/d174.pdf (accessed on 18.05.2020).

[13] Project Jasper. A Canadian experiment with distributed ledger technology for domestic interbank payments settlement. White paper prepared by Payments Canada, R 3 and Bank of Canada. 2017. URL: https://www.payments.ca/sites/default/files/29-Sep-17/jasper_report_eng.pdf (accessed on 18.05.2020).

[14] UBS press release. Utility settlement coin concept on blockchain gathers pace. 2016, August, 24.

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Interpreting the Change of the Age and Experience Coefficient in Motor Third-Party Liability Insurance

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ABSTRACT

The article highlights the influence of the equity factor in the insurance industry on the example of the age and driving experience coefficient development in the motor third-party liability insurance (MTPL). The **aim** of the research is to study risk level variation in the car insurance industry depending on the age and experience of a driver. The authors consider the Automated Information System (AIS) data of MTPL as a **methodological basis** of the article. The results show that the risk level depends on each of the parameters, in particular, risk levels for older drivers are lower by comparison with younger drivers with the same level of driving experience. On this basis, the authors design a two-dimensional table to assess risk levels where the risk level between separate cells differ in five times. The study presents and analyses the actuarial calculations which served as a foundation for the MTPL policy change in 2018*. The article provides recommendations on improving MTPL tariffing within the modern model framework and motor tariff liberalization. The study allowed the authors to verify theoretical assumptions and find direct mathematical relations between the age and experience coefficient and its constituent data. The authors **concluded** that it is reasonable to introduce additional categories of drivers taking into consideration demographic changes and retirement age increase. The **results** of the research may improve MTPL affordability and have practical utility for motor insurers in transition to individual tariffs. They also can help to address discussions and approaches to estimate a coefficient of age and experience (CAE) set by Article 9 of the Federal law of 25.04.2002 No. 40-FZ "About obligatory insurance of civil liability of owners of vehicles".

Keywords: insurance; MTPL; rate; correction factor; actuarial calculation; GLM-model; coefficient; age; driving experience level; gender

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* Bank of Russia Ordinance No. 5000-U, of December 4, 2018, "On limits for the basic rates of insurance tariffs (their minimum and maximum values in rubles), coefficient of insurance rates, insurance rates structure requirements, and the procedure for their application by insurers in calculating insurance premiums of MTPL" (registered with the Ministry of Justice of Russia on December 29, 2018 No. 53241).

INTRODUCTION

A lack of financial literacy, a wary attitude of potential customer to insurance companies, and low insurance service affordability hinders the development of insurance relations in Russia. Leading Russian insurance researchers discussed this back in the 1990s and 2000s, professors E.V. Kolomin [1], R.T. Yuldashev [2], V.B. Gomellya [3, 4].

Fair pricing, insurance tariffs adequacy, as well as understanding the rights and financial liabilities under the insurance policy ensure a successful deal between the insurer and insured. The issues of the positive impact of a fair decision on the development of a choice strategy were considered by economists at the beginning of the 20th century [5, 6].

Regular discussions on how to calculate insurance premium for common insurance types ensure the development of insurance relations.

The company's insurance service assessment in Russia depends largely on the MTPL, as the most common type of insurance. The surveys conducted by the research group of the Financial University under the supervision of Professor A.N. Zubets[1] [7], indicate that in recent years insurance has been viewed as an economically justified solution to manage hazards and ensure a feeling of comfort and confidence (*Fig. 1*).

At the same time, the number of respondents considering insurance a waste of money is steadily decreasing. National Agency of Financial Research (NAFI) survey demonstrated similar results where at least 63% of respondents generally had a positive attitude towards insurance in 2019[2].

Since 2003 compulsory MTPL in Russia has undergone several changes and is viewed much more positively now.

The Russian Popular Front (ONF) monitoring survey conducted in 2019 revealed respondents' positive expectations of compulsory MTPL reform. This will undoubtedly have an impact on the general perception of insurance services[3], including the implementation of the home emergency cover policy which is of social importance.

Widely accepted MTPL rate calculation and recognized benefits of the insurance market ensure Russian insurance industry growth. It is of crucial importance to provide an actuarial reliable calculation of tariffs and use all the available tools to guarantee fair pricing of MTPL cover.

Although fair pricing is of great concern to consumers, it is hardly addressed by the Russian economists. In particular, it is of special concern to senior vehicle owners with regards to MPTL tariff calculation based on the age and driving experience coefficient.

MTPL TARIFF CALCULATION METHOD

Insurance science describes development and methods of motor insurance in detail, which is due to its wide spread and popularity of insurance products, as well as its implementation history. Casco and MTPL insurance are characterized by high loss and claim history ratio, which encourages the development and implementation of loss reduction methods for these insurance types. Thus, the generally accepted bonus-malus system [8] depends on the accident history and the use of franchises.

Many of the generally accepted car owners' liabilities and Casco risk factors of Russia are included in the MTPL tariff calculation formula, but not all. This fact does not suggest effective approaches to the individual premium calculation.

$$T = TB \times C, \quad (1)$$

T — tariff; TB — tariff base (minimum and maximum value defined by the Bank of Russia); C — corrective coefficient.

[1] URL: https://www.consult-cct.ru/fakti/19573.html (accessed on 01.05.2020).

[2] URL: https://tass.ru/ekonomika/6743291 (accessed on 01.05.2020).

[3] URL: https://onf.ru/2019/11/06/eksperty-onf-nastaivayut-na-otmene-territorialnogo-koefficienta-i-uvelichenii-vyplat-po/ (accessed on 01.05.2020).

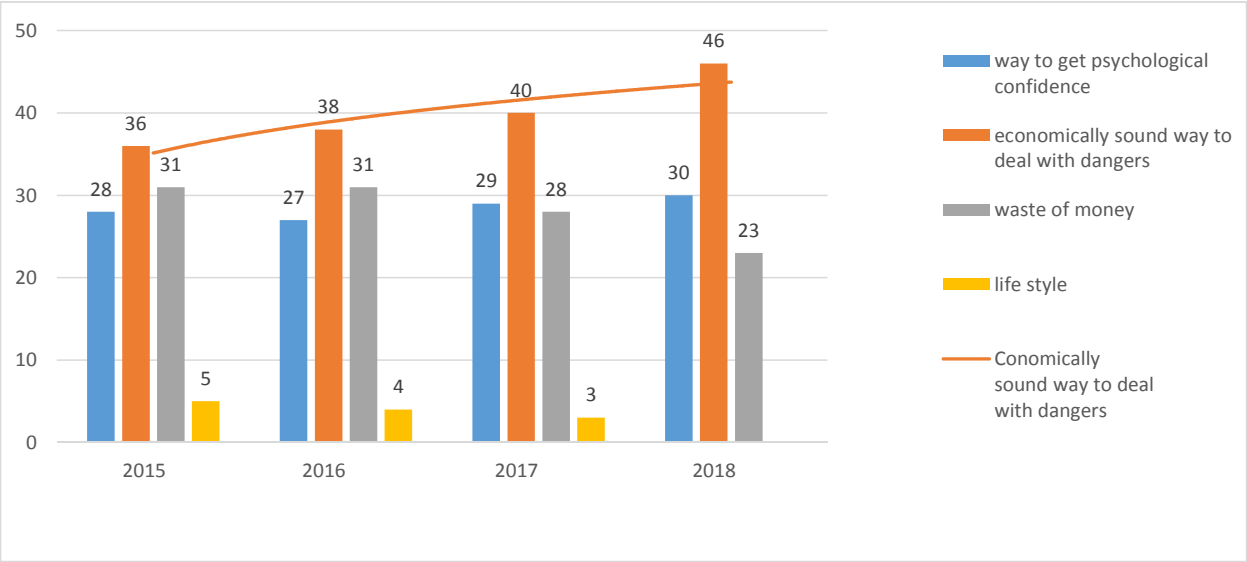

Fig. 1. **Distribution of answers to the question: "What is the meaning of insurance?", % of all respondents**

Source: Report on fundamental research work "Formation of the concept and development of the theory of insurance in modern society", the state task of the Financial University for 2019.

$$C = CT \times CBM \times CAE \times CL \times \times CP \times CS \times CIP \times CV, \quad (2)$$

CT — territorial coefficient; CBM — bonus-malus; CAE — age and driving experience coefficient; CL — "multiple drivers" limit; CP — power coefficient; CS — coefficient of the period and purpose of using a special vehicle (snow-clearing, agricultural, watering, etc.); CIP — insurance period; CV — applies for gross violations of MTPL policy.

These coefficients do not fully detail specific features of vehicles. For example, the use of a vehicle as a taxi is not always registered and considered, the car-sharing statistics are only being collected. Although, there is evidence that driving style changes significantly when driving your own car and a shared car[4].

Corrective coefficient of CAE defines driver's age and driving experience, however does not consider the actual practical driving experience. There are situations when the non-practical driving experience is over 20 years, but a driver has been using a driving license only as an additional identification document.

$$CAE = f(A, E), \quad (3)$$

где A — age of the driver; E — driving experience.

Currently, electronic devices are used to collect information about the insured's driving style, place, and time of the use of vehicles. A significant amount of data has been gathered about the impact of the place of residence, building floor, garage in possession, gender, age, driving experience, the profession of the insured, the brand of the car and its age. Although, these data have not been reflected on the insurance rates (1–3).

In many countries, including Russia, there is a significant gap in Casco tariffs for various car models with comparable engine power, but MTPL calculation in Russia is only based on the engine power, age, driving experience of the driver, and the territory of residence.

For example, the full Casco tariff for Volvo cars will be lower than for Subaru and significantly lower than for Lexus[5], which is justified by accident and theft history of these models,

[4] Morzharetto I. Chariot of common use. Profile. 2020;4(115):38–41.

[5] See, for example, URL: https://www.sravni.ru/kasko/ (accessed on 01.05.2020).

as well as owner's behavior. It is reasonably believed that the owners of relatively expensive and insured cars demonstrate prudent behavior on the road, other car owners also prefer not to take risks with these vehicles, which is immediately evident when analyzing the data of road accidents. There are also opposite examples reflecting the influence of consumer behavior on the driving style, perception of a car and accident history, leading to different insurance tariffs.

Not all risk factors are considered in tariffing, which may be due to legislative and ethical restrictions. For example, in Russia there is a clear connection between the presence of infants and young children in the car and a change in the driving style of a young mother: according to the rules, the child should be in the back seat, but a mother driver will turn around on the child's actions and may not notice road hazards in time. According to most insurers, a change of a road behavior leads to a significant increase in the number of small accidents. However, this circumstance rarely leads to a tariff increase, as it is perceived negatively by consumers, and insurance companies tend to maintain consumer loyalty.

Tariffs for Russian MTPL are based on the bonus-malus system, which, due to the limited impact on tariffs, does not keep up with them. It is important to note that the parameters related to the brand of a car, total driving experience, and gender of a driver are not considered when calculating MPTL rates, due to the unified approach. These parameters affect the tariff in a non-linear way. For example, a taxi driver will have a considerable driving experience, but this will not have a positive impact on the accident history. The same parameters are accounted for when calculating Casco tariffs, which allow to reduce loss ratio and increase the efficiency of the insurance contract.

A fair MTPL tariff calculation based on the system of correction factors for the base tariff established by Russian legislation will be limited due to the incompleteness of risk factors, while the use of a simplified age-driving experience model does not allow achieving the required accuracy.

Accordingly, the CAE coefficient should effectively consider the insured's consumer behavior [coefficient CCB, formulas (4–6)].

$$\text{CAE} \rightarrow \text{CCB} \tag{4}$$

$$\text{CIP} = f(\text{A}, \text{E}, \text{E1}, \text{Gender}), \tag{5}$$

where E1 — actual driving experience, calculated by the total period of MTPL insurance and/or data provided by insurance companies; Gender — driver's gender.

The CP coefficient should consider the consumer behavior of a driver and be statistically reasonable. Currently, statistical data have been collected to predict the driving style of the vehicle owner, depending on the brand of the car, colour of the car, etc.

$$\text{CP} \rightarrow \text{CPB}, \tag{6}$$

where CPB — power and brand coefficient.

The introduction of additional correction factors will require significant actuarial calculations and complicate the process of MTPL tariffs change. It is easier and more efficient to implement changes at the micro-level of insurance companies based on the liberalization of the insurance tariff, rather than at the federal level.

In addition, the accumulated statistics allow considering age and driving experience data more effectively even using the current calculation strategy.

OUTLINING THE PROBLEM

The aim of the study is to identify changes in the level of risk for MTPL policy, depending on the age and driving experience of a driver.

We used the following sources for analysis: AIS MTPL database on MTPL insurance policy and losses for the period from 01.01.2014 to 06.30.2018, open data of the Bank of Russia, the All-Russian Union of Insurers and the

Russian Association of Motor Insurers data [9], market studies of the authors [10–12], motor fleet data [13] and regional development problem statistics [14, 15].

Before the start of the research, the data was cleared from the MTPL insurance policies with "multiple drivers", as well as policies where the vehicles belonged to legal entities. As a result, data with a combined exposure of 100.2 million policy-years, containing information on the drivers' age and experience, were available for the study.

At the first stage of the research, the contracts and data on payments, which were brought to final size, considering the estimates of insurance reserves, were grouped by drivers' age with increments of 1 year. The authors used a general linear model (GLM) when calculating actuarial data and explained it [16–21], as well as the works of Russian and foreign actuaries applicable in motor insurance [22–24][6].

GLM is the main model used worldwide for several decades for tariffing in motor insurance industry. In addition, in recent years, approaches to tariffing based on machine learning methods, which are aimed at working with large amounts of statistical information, have become more widespread. However, despite the machine learning methods, GLM models are still very popular, since they are distinguished by the transparency of the process in obtaining results, extensive practical application, and the presence of many products that implement GLM algorithms.

GLM is a multiple regression model that allows finding the correlation between the dependent variable (number of insured events, average loss) and predictors (pricing factors). In tariffs, as a rule, separate models are used for the average loss and the frequency of the insured event. In addition, to estimate the average loss, the Gamma distribution is used; to estimate the frequency, the Poisson distribution is used.

The correlation between the insurance premiums and exposure in the group allows assessing the real level of risk in each age group (in fact, the net rate). To increase the clarity of data display and by the purpose of this study, the concept of "risk level" was additionally introduced, i.e. the obtained values were normalized, where the value of the predicted net tariff in the youngest age group was taken as the unit. The results are presented in *Fig. 2*.

Fig. 2 and the calculations demonstrate that a decreasing risk level can be traced depending on the age of the driver. The ratio of the risk level in the youngest group and the most reliable (63 years) differs by 5.9 times, which needs to be reflected on the age–driving experience coefficient (CAE) of the tariff reform.

The results analysis shows the presence of an "outburst" at a point of age 21 years. According to most experts, this is due to the return of a significant part of men of military age from the army and them obtaining a driving license.

For further practical application, it is worth highlighting the section of the curve of 18–30 years, where there is a rapid change (decrease in acceleration) of the risk level, and the segment of 47–57 years, where the change of the acceleration and trend vector occurs (in fact, the straight section of the first derivative, where the second derivative changes to the one with the opposite meaning).

The dependence of the risk level on age can be represented in the formula (7) with a high degree of reliability $R^2 = 0.9969$:

$$RL_{age} = 0.0000005431*A^4 - 0.0001135196*A^3 + 0.0088109900*A^2 - 0.3055612998*A + 4.2827146015, \quad (7)$$

where RL_{age} — risk level depending on the age of a driver; A — the age of a driver.

The authors tried to find explicit inflection points of the risk level function depending on age RL_{age}, where a sharp change of risk level

[6] Risk Classification and Health Insurance. CIRRELT. 2011–67. p. 55. URL: https://www. cirrelt.ca/DocumentsTravail/CIRRELT-2011–67.pdf.

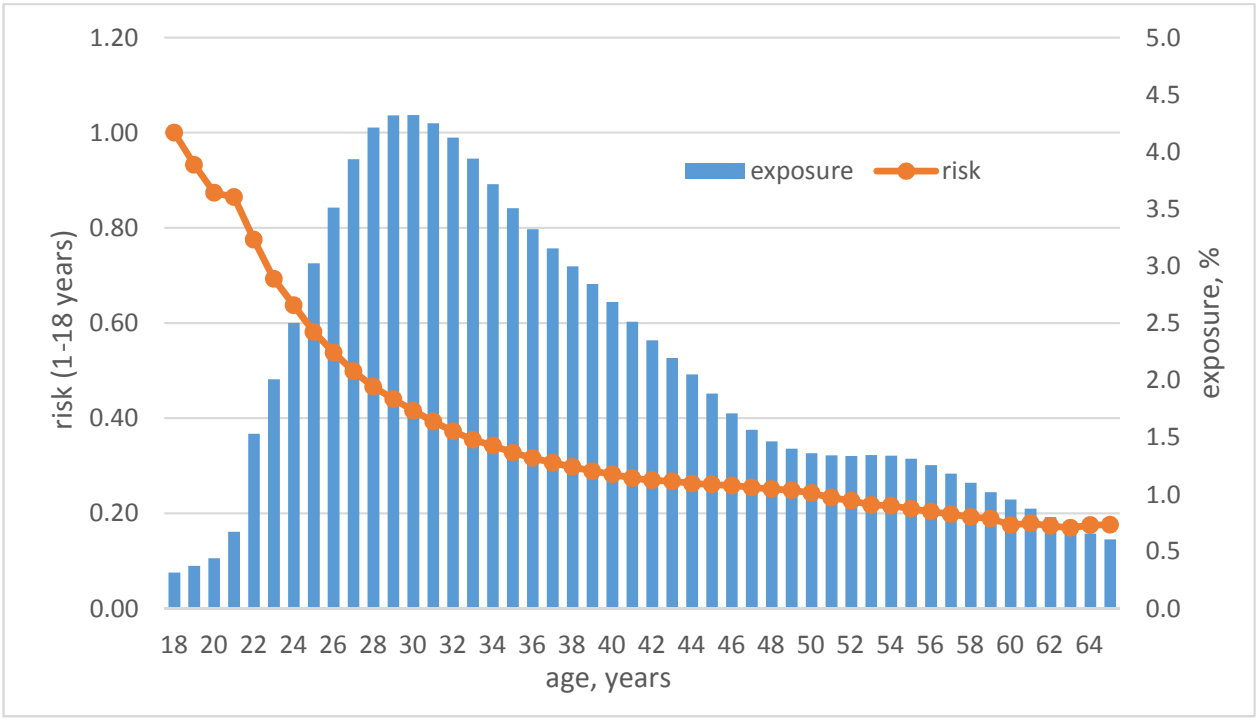

Fig. 2. **The conditional dependence of the driver's risk level on age**

Source: AIS MTPL data and authors' calculations.

with age could be expected. However, the differentiation of this equation did not allow them to be identified — the risk reduction rate gradually decreases to the age of 46 years, and a complete change in trends occurs at the point of 50 years (the 2nd derivative crosses the abscissa axis). A graphical representation of the derivatives of function (7) is presented in *Fig. 3*.

A similar calculation may be applied to the driving experience data. Available data allow analyzing the results in the range of driving experience 0–47 years. In this case, the risk level of the most inexperienced drivers (0 years of experience) and the most reliable group (44 years of experience) has an even greater gap — 6.3 times. The results are presented in *Fig. 4*.

The dependence of the risk level on the driving experience of a driver can be represented in the formula (8) with a high degree of reliability $R^2 = 0.9959$:

$$RL_{experience} = 0.0000009153*S^4 - 0.0001091855*S^3 + 0.0046575579*S^2 - 0.0899548092*S + 0.9829409818, \quad (8)$$

where $RL_{experience}$ — risk level depending on the driving experience; S — driving experience.

It should be noted that citizens over 18 years old with no age limit and of 16 years old under certain restrictions are allowed to obtain a driving license in Russia.

A noticeable deviation from the trend is seen at the point "3 years" of driving experience. Interviewed experts associate this outburst with the return of drivers from the army who had managed to get a driving license before being called up for the military service (2–3 years of non-practical driving experience), but did not have any actual driving experience. This outburst correlates with a similar deviation in the age category of 20 years, as shown in *Fig. 2*. This category also includes drivers who first obtain a driving license and only after some time (2–3 years later) get a vehicle. Such drivers may

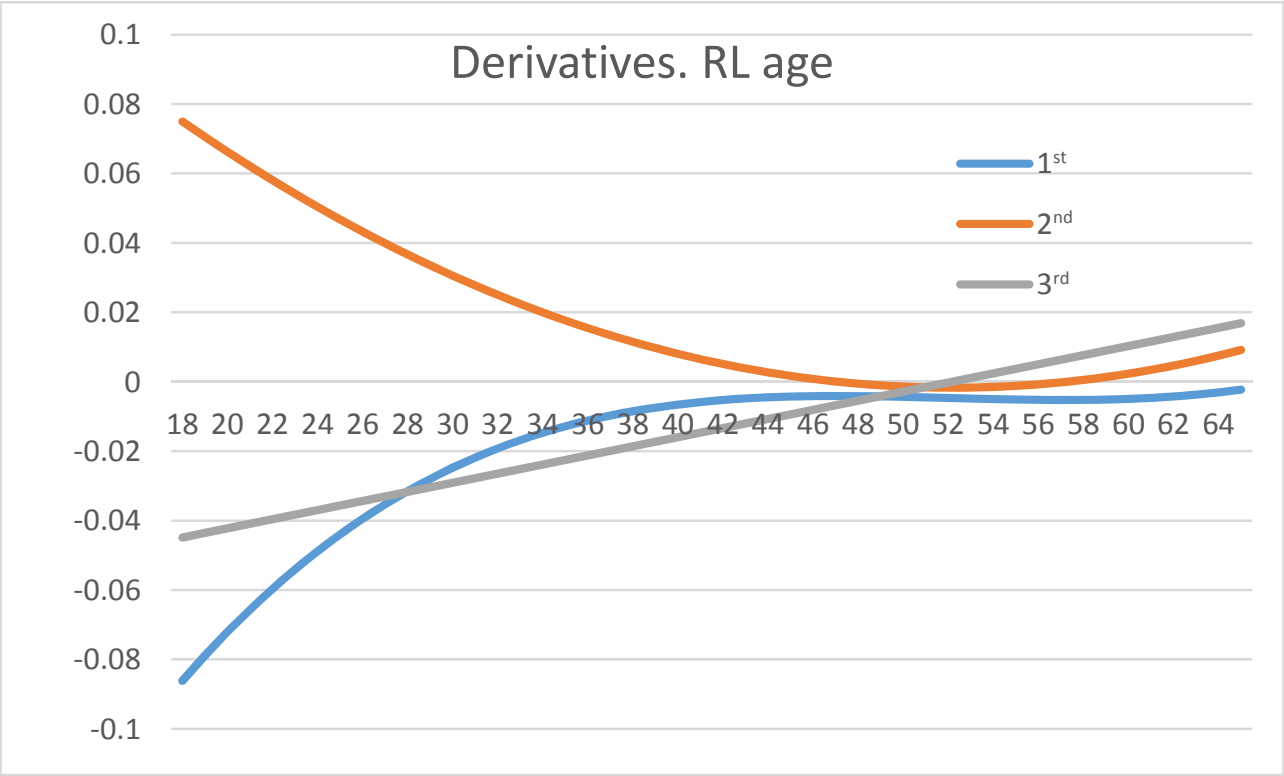

Fig. 3. **The first derivative of the RL age function**

Source: AIS MTPL data and authors' calculations.

Note: to increase visualization the values of the second derivative are scaled up by 10 times, the third derivative by 100 times.

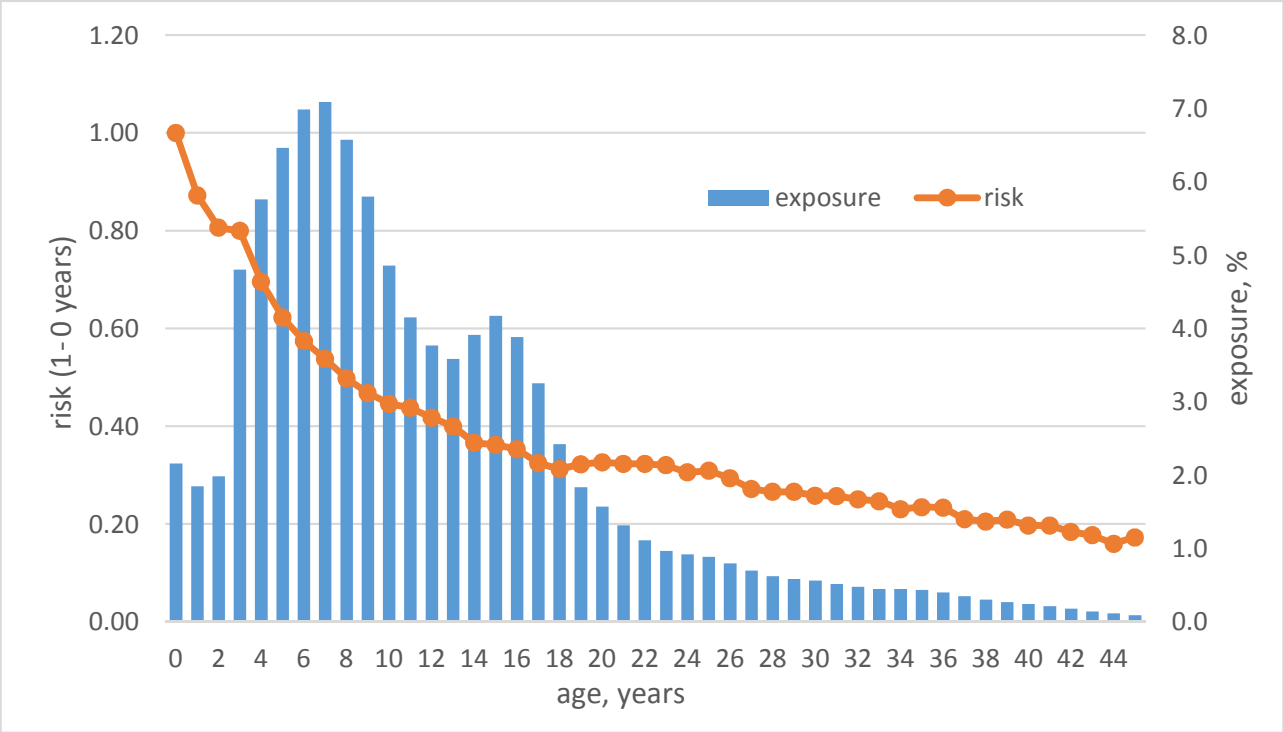

Fig. 4. **The conditional dependence of the driver's risk level on his experience**

Source: AIS MTPL data and authors' calculations.

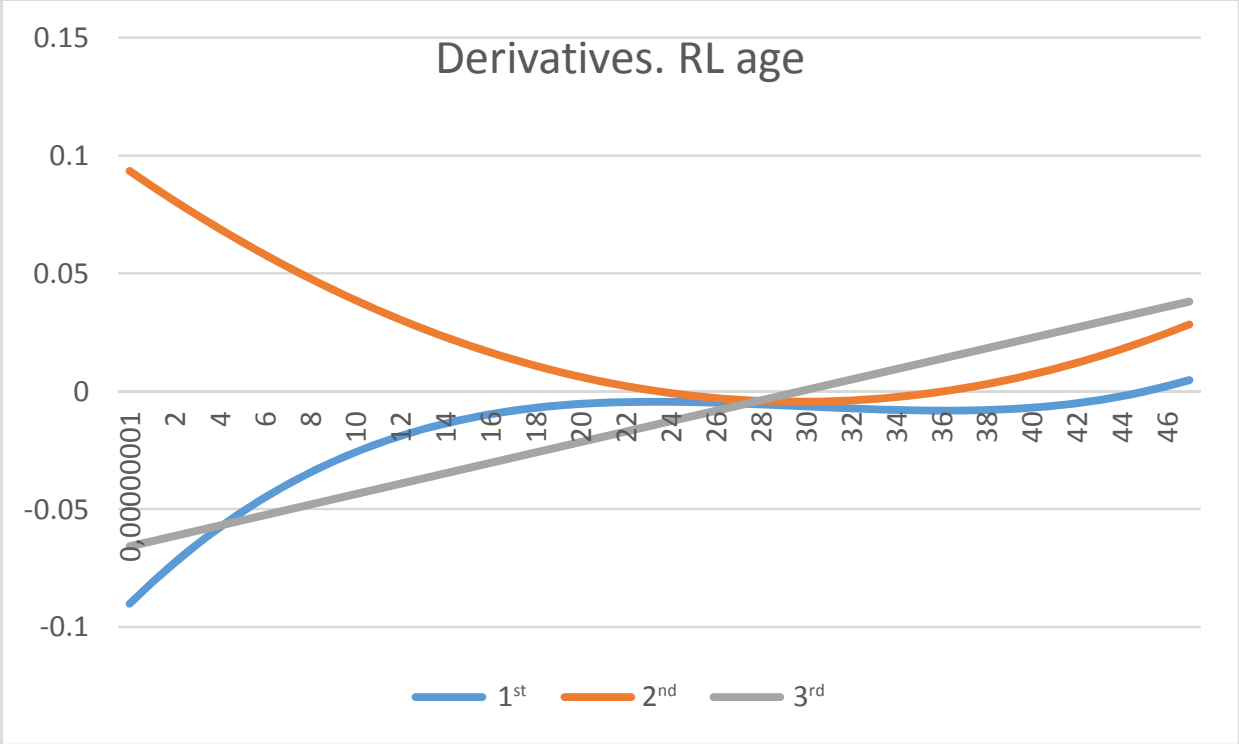

Fig. 5. **The conditional dependence of the driver's risk level on his experience**

Source: AIS MTPL data and authors' calculations.

Note: to improve visualization the first derivative has been scaled up by 10 times, and the third by 100 times.

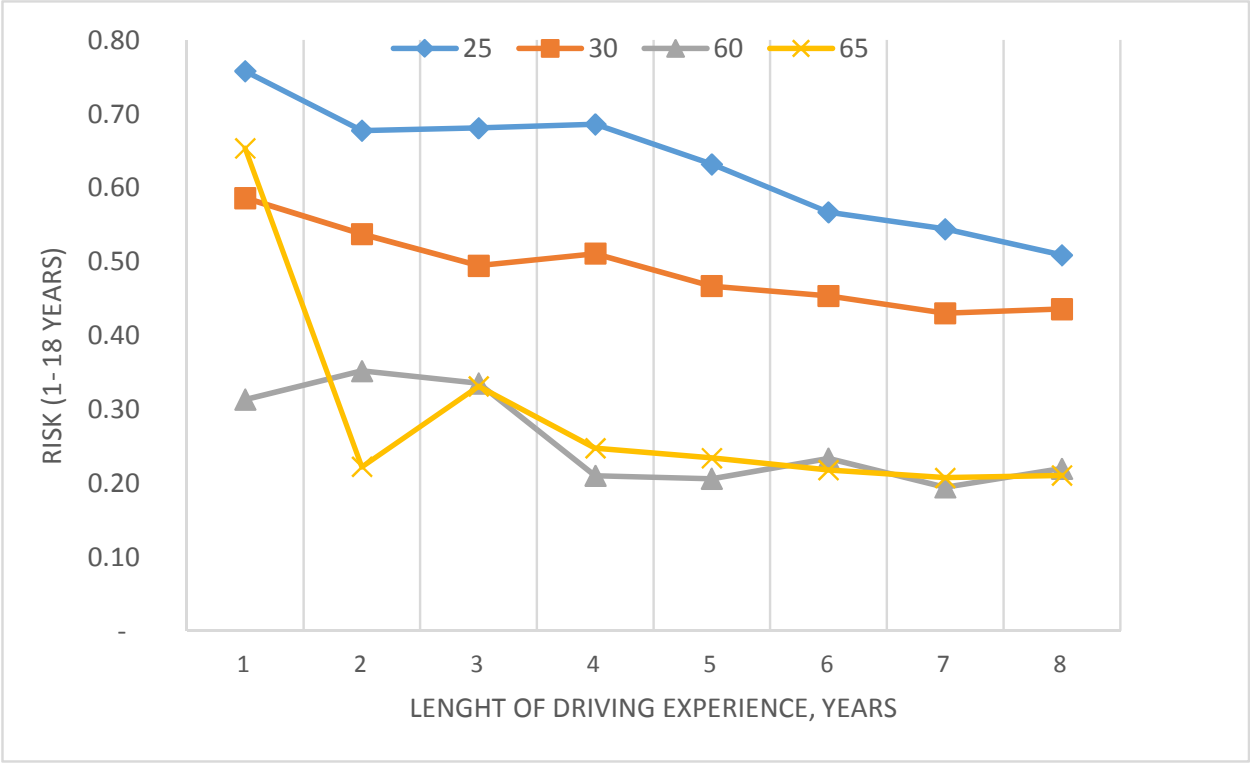

Fig. 6. **Dependence of the risk level on the driving experience for certain age groups**

Source: AIS MTPL data and authors' calculations.

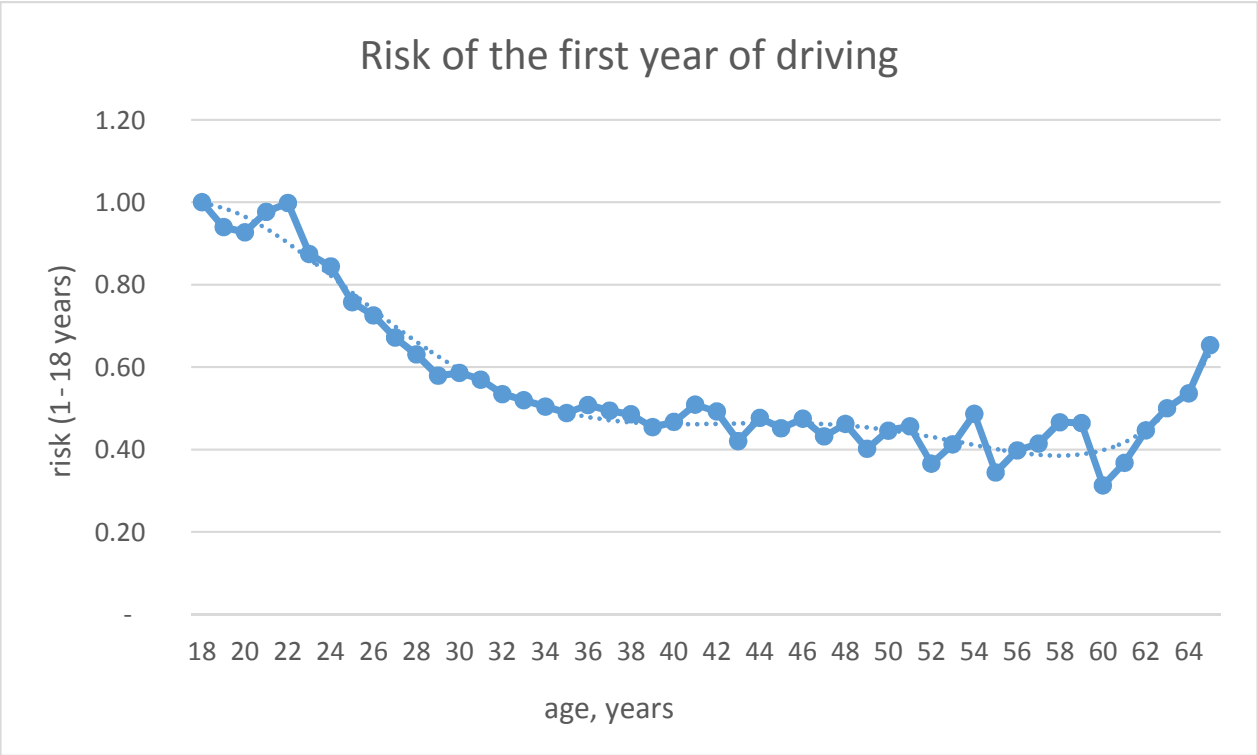

Fig. 7. **Dependence of the risk level in the first year of driving on the age of the driver**

Source: AIS MTPL data and authors' calculations.

have non-practical two-three-year driving experience, but the lack of practical driving experience shows a high level of risk.

The authors attempted to search for several key factors of the risk level function depending on the driving experience $RL_{experience}$, where a sharp change in the risk level depending on the driving experience would be expected. However, the differentiation of this equation also did not allow us to identify obvious factors for developing solutions — the risk level is gradually decreasing. We can distinguish segments with an approximately equal rate of change of the risk level: 0–1–2 years, 3–4 and 5–6, years, then the rate of change of the risk level decreases and becomes insignificant after 14 years of driving experience. A graphical representation of the derivatives of function (8) is shown in *Fig. 5*.

The obtained data allowed us to proceed with a two-factor analysis of the dependence of the risk level on the age and driving experience. *Fig. 6* shows the dependencies of the risk level $RL_{experience}$ for the first seven years of driving experience for several age groups. It can be seen from the graph that the risk level of young drivers is significantly higher than the risk level of senior drivers with similar driving experience.

The authors noticed a sharp curve in the "after 63 years" segment. In this area of the graph, there is an obvious increase of risk for inexperienced drivers (driving experience 0 years). But this effect completely disappears after the first year of driving (the risk level decreases immediately by half), while for young drivers there is no such sharp decrease of the risk level, but a gradual decrease of the risk level.

The dependence of the risk level on the driver's age should be emphasized separately, for example, in the first year of driving the risk level of young new drivers is about two times higher than the risk level of forty-year-old new drivers. Graphical data are presented in *Fig. 7*.

RESEARCH RESULTS

Thus, there are mathematical prerequisites for building a two-dimensional risk assessment model for the age-driving experience parameter. *Fig. 8*. represents the graphical data.

The results can be used to implements a reform of the age-driving experience coefficient calculation. It should be noted that the MTPL tariff system considered the use of large aggregations by age from 2003 until 2019 (*Table 1*).

Age–driving experience groups presented in *Table 1* are very heterogeneous in terms of risk, as it was mentioned in the previous analysis.

In 2019, the Bank of Russia has carried out a reform of the age-driving experience coefficient calculation system. As a result, the number of age-driving experience groups has increased to 58. The current coefficient values are established by the Bank of Russia Ordinance No. 5000-U, of December 4, 2018, "On limits for the basic rates of insurance tariffs (their minimum and maximum values in rubles), coefficient of insurance rates, insurance rates structure requirements, and the procedure for their application by insurers in calculating insurance premiums of MTPL", and are presented in *Table 2*.

The increase in the number of separately tariffed groups is a step aimed at clarifying the tariff system of compulsory MTPL. However, a comparative analysis of the data in *Table 1* and *Table 2* shows that the coefficient values have changed insignificantly. For example, the majority of drivers had a coefficient equal to one before 2019, after the reform of 2019, the coefficient decreased only to 0.96, and for the youngest and most inexperienced drivers, the coefficient increased from 1.80 to 1.87. Such a change of the driving experience coefficient does not allow us to fully consider the risk level for the selected groups. It is demonstrated in *Table 3* which provides the coefficient estimation based on the accumulated data of the actual loss ratio.

The results may be compared with the current tariff system, as presented in *Table. 4*. To

Table 1

The system for calculating the coefficient of age and experience until 2019

Experience, years / Age, years	0–3	More than 3 years
16–22	1.8	1.7
23 –	1.6	1.0

Source: authors' calculations according to the law of MTPL*.

* Federal Law of April 25, 2002 No. 40-FZ (as amended on December 2, 2019) "On Compulsory Motor Third Party Liability Insurance" (with no amendments and supplements, came into force on 01/01/2020).

increase visibility green areas indicate sectors where the CAE may be reduced, and red areas where the CAE should be increased.

Visually, there are several areas: the age category of 22–24 years, where the current coefficients need to be increased by 1.4–1.9 times; and the age categories older than 40 years, where the current coefficients may be reduced by 15–35%. Drivers with a driving experience of 3–6 years are also clearly distinguished and overly confident in their skills. Accordingly, it is reasonable to focus on strategies aimed at reducing road accidents.

The proposed approach to risk segmentation in calculating the age–driving experience coefficient cannot be considered without the CL coefficient (correction factor referring to multiple drivers listed on the same car insurance policy).

On average for the period 2014–2018 half of the share of "multiple drivers" insurance policy was 11.7%, and the average value of CAE + CL was 1.13. When switching to a different tariff calculation system for the CAE coefficient, it will be necessary to refer the value for the CL coefficient to a higher (or at least the same) risk factor in the CAE risk group. In this case, there will be no disputes if high-risk

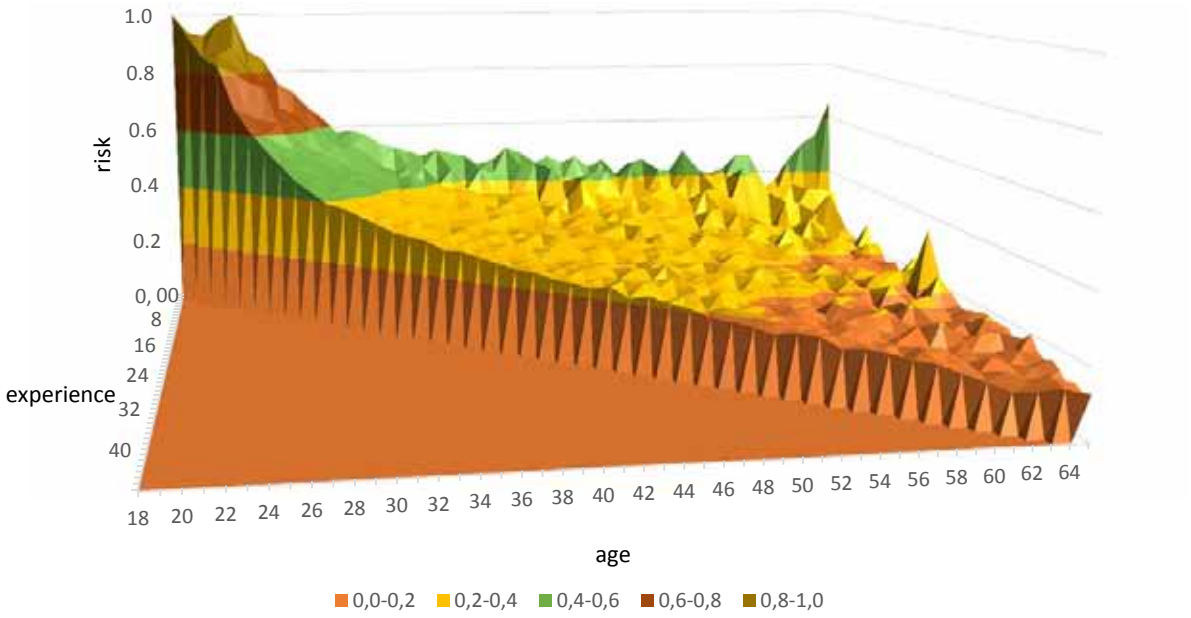

Fig. 8. **Dependence of the risk level on the age and experience of the driver**

Source: AIS MTPL data and authors' calculations.

Table 2

The current system for calculating the age and experience coefficient

Experience, years / Age, years	0	1	2	3–4	5–6	7–9	10–14	More than 14
16–21	1.87	1.87	1.87	1.66	1.66			
22–24	1.77	1.77	1.77	1.04	1.04	1.04		
25–29	1.77	1.69	1.63	1.04	1.04	1.04	1.04	
30–34	1.63	1.63	1.63	1.04	1.04	1.01	0.96	0.96
35–39	1.63	1.63	1.63	0.99	0.96	0.96	0.96	0.96
40–49	1.63	1.63	1.63	0.96	0.96	0.96	0.96	0.96
50–59	1.63	1.63	1.63	0.96	0.96	0.96	0.96	0.96
Older than 59	1.60	1.60	1.60	0.93	0.93	0.93	0.93	0.93

Source: authors' calculations according to the law of MTPL*.

* Federal Law of April 25, 2002 No. 40-FZ (as amended on December 2, 2019) "On Compulsory Motor Third Party Liability Insurance" (as amended and supplemented, came into force on 01.01.2020).

Table 3

Risk level calculation results depending on the age and experience

Experience, years / Age, years	0	1	2	3–4	5–6	7–9	10–14	More than 14
16–21	2.45	2.45	2.49	2.34	2.34			
22–24	2.45	2.45	2.36	2.05	1.59	1.45		
25–29	2.41	2.07	1.85	1.75	1.47	1.26	1.03	
30–34	1.90	1.61	1.48	1.43	1.23	1.10	0.95	0.87
35–39	1.84	1.45	1.39	1.25	1.11	0.96	0.89	0.80
40–49	1.71	1.43	1.33	1.17	1.01	0.90	0.82	0.72
50–59	1.62	1.41	1.22	1.13	1.01	0.82	0.82	0.64
Older than 59	1.55	1.41	1.22	1.06	1.01	0.75	0.75	0.61

Source: AIS MTPL data and authors' calculations.

Table 4

Assessment of deviations of the actual risk level depending on the age and experience based on the current MTPL rating system (%% of the current system)

Experience, years / Age, years	0	1	2	3–4	5–6	7–9	10–14	More than 14
16–21	31	31	33	41	41			
22–24	38	38	33	97	53	40		
25–29	36	22	13	68	41	21	–1	
30–34	16	–1	–9	37	18	9	–1	–9
35–39	13	–11	–14	26	16	0	–8	–16
40–49	5	–12	–18	22	5	–6	–15	–25
50–59	–1	–13	–25	18	5	–15	–15	–34
Older than 59	–3	–12	–24	14	8	–19	–19	–34

Source: AIS MTPL data and authors' calculations.

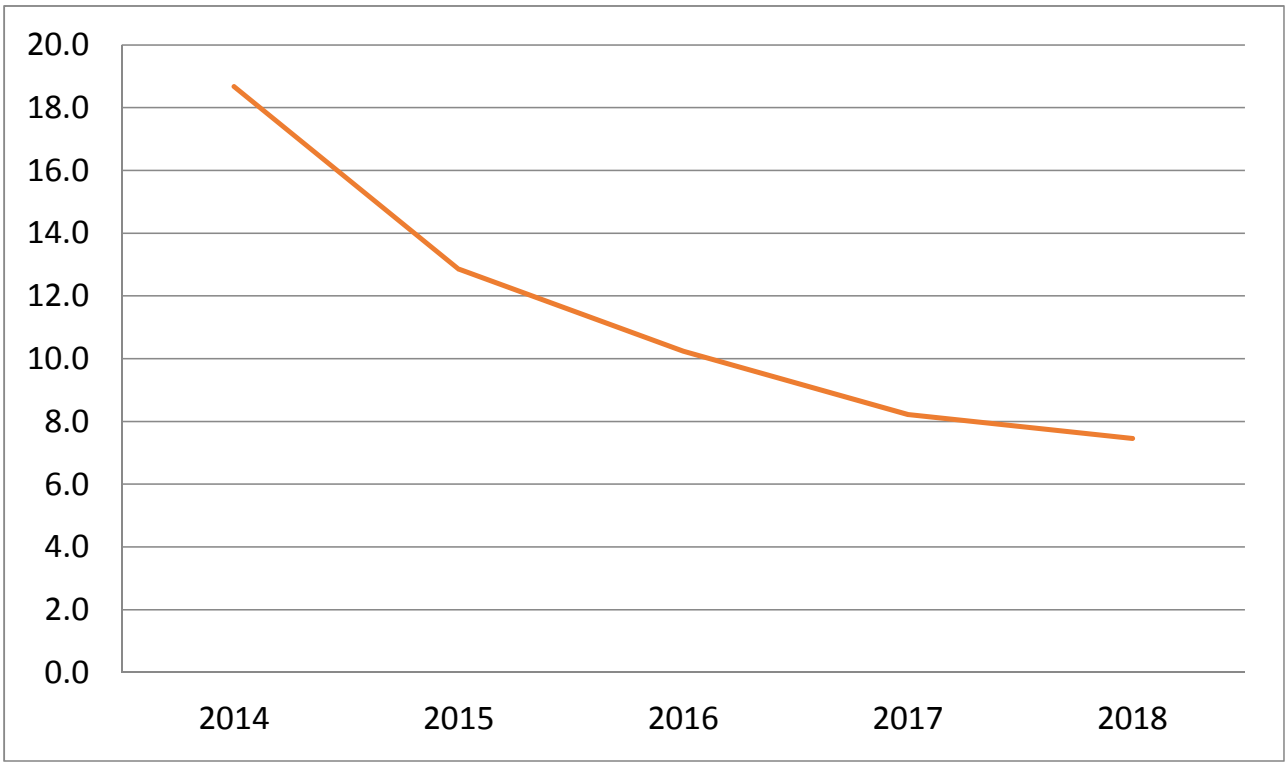

Fig. 9. **The share of "without limitation" insurance certificate holders to the total number of drivers**

Source: AIS MTPL data and authors' calculations.

drivers opt for the "multiple drivers" insurance. In addition, it is necessary to preserve the integral total value of the CL and CAE coefficients.

At the same time, a clear distinction of drivers by risk level and the high (conditionally blocking) value of the CL coefficient is likely to imply the migration of drivers towards insurance policies based on individual terms (without a tendency to tilt toward "multiple drivers" policy).

It is important to note that the expansion of liability limits in 2015 led to a noticeable increase of the average premium for compulsory MTPL insurance, which forced most drivers to refuse purchasing "multiple drivers" policies, and ensured more careful attention to their claim history (bonus-malus system).

This transition was accompanied by complaints to the Bank of Russia in connection with an incorrect (incomplete history) calculation of the bonus-malus coefficient, which required the regulator to actively intervene in the activities of market participants.

CONCLUSIONS

In general, the development of the Russian MTPL insurance industry is similar to that of the economically developed countries. We assume it will lead to the liberalization of tariffs when insurers are able to set tariffs considering all risk factors.

In 2019, MTPL reform, aimed at individualizing of tariffs, led to the average cost reduction of the insurance, owing to the market competition and electronic form of MTPL. It contributed to the wide use of insurance policy in the country where 99% of vehicle owners purchased it[7]. In the first quarter of 2020, the average insurance premium decreased in 53 regions of Russia, where more than 72% of the population live[8]. However, COVID-19 will have a significant impact on these data and the in-

[7] Measuring people's attitude to MTPL insurance, February 2020. URL: https://www.consult-cct.ru/fakti/19573.html (accessed on 01.05.2020).

[8] URL: https://www.consult-cct.ru/itogi/19991.html (accessed on 01.05.2020).

surance industry as a whole. Therefore, it is important to update the MTPL tariffs regularly.

AIS MTPL database provides accurate information and actuarial data for any coefficients of the MTPL tariff formula. In addition, Casco voluntary insurance statistics should be considered for the MPTL tariff initiatives.

The study allowed us to verify theoretical assumptions and identify mathematical patterns of the age and driving experience coefficient and its components.

However, in case of a "multiple drivers" insurance policy it is not possible to consider factors of age and driving experience for a vehicle. Nowadays only telematics devices collect this information, but they are hardly used in Russia. The quality of data may be affected by outdated or invalid information provided by the insurance company in terms of payment.

We estimate the error rate to 5–7%; the segments of lower exposure are most affected by this. Another issue is inaccurate data on policy attributes or an insured event, which may impact the conclusions and forecast accuracy. The authors considered the error factors.

The research suggests a grouping of values by target groups ensuring a reasonable distribution of risks among citizens depending on their age and driving experience. Also, it shows that there are groups of population with an overrated risk (middle-aged and senior drivers of more than 10 years driving experience) and it is reasonable to lower MTPL rates for them; and policyholders with 3–6 years of driving experience (in particular, aged 22–29 years) for whom MTPL rates are significantly low considering their risk level.

The findings of the study are important for the MTPL insurance affordability discussions for senior drivers (including pensioners) in particular. The results may provide a mathematically-based foundation for revising MTPL pricing. It is possible and reasonable to introduce additional categories of drivers, considering the demographic changes and retirement-age increase.

A reasonable reduction in tariffs will increase the financial affordability of insurance services mainly for people of the older generation and will inevitably lead to the socialization of insurance services.

During the period of self-isolation aimed at reducing the negative consequences of COVID-2019, the use of personal vehicles decreased, the number of accidents and, accordingly, payments for compulsory MTPL and hull insurance decreased. A significant number of cars were not used, which led to the MTPL usage decrease. In future, payments will increase, as transport returns to the roads, and the cost of repairs will increase due to the ruble devaluation. Accordingly, this may be considered for the liberalization of MTPL tariffs. Also, these factors should be accounted for discounts for low- and high-accident drivers.

The fairness of tariffs recognized by the majority of the population for the most common type of insurance will undoubtedly have a positive impact on the development of the insurance sector in Russia.

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Yazykov A.D.— interpreted and described the results, contributed to the conclusions of the manuscript.
Yanenko E.A.— collected statistical data, performed calculations and modelling, designed tables and graphical representations.
Gryzenkova Yu.V.— interpreted and described the results, designed tables and graphical representations.

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Post-Pandemic Scenarios of Economic Development of Developed Countries and Russia

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ABSTRACT

Amid the Kondratiev cycle`s downward slope movement and global pandemic, a recession in many countries is likely to lead to a deep long-term economic crisis. The **aim** of the article is to study the simplest recession indicators in developing and developed countries, economic-recovery measures, and economic development scenarios. The **objectives** of the paper are to study current economic situations in different countries, including Russia; identify measures to prevent a recession in developing and developed countries; evaluate possible economic development scenarios with regard to the cyclical dynamics in the current climate. The authors used **methods** of analysis, modelling, monitoring of major economic indicators based on the data of past recessions and other crises. The **results** of the research show different scenarios of economic growth depending on the number of Covid-19 cases and the effectiveness of government's responses to the pandemic; a correlation between monetary and fiscal policies in overcoming crisis; monetary policy priorities necessary for economic recovery; problems and prospects of monetary and fiscal policy implementation. The authors **concluded** that GDP, unemployment, and inflation rate are key indicators for the evaluation of the current and future money, credit, and production-related events. Proactive measures ensure a smoother average economic growth. Both monetary and fiscal policy have advantages and disadvantages. Proactive measures, in particular, inevitably cause two time lags: in the reaction to a recession and in the effectiveness of implemented measures. The governments and central banks must be proactive in overcoming the economic recession and providing support to the citizens.

Keywords: economy; pandemic; GDP; unemployment; inflation; fiscal policy; monetary policy; economic development scenarios, cycle, crisis, recession

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INTRODUCTION

Life has changed dramatically. World leaders, governments, banks and millions of citizens face a challenge of survival. Coronavirus is not only life-threatening but also impacts people's livelihoods and economic stability in both developed and developing countries.

The pandemic affected the economic, political, social and other spheres of life of the population and caused the greatest economic shock in the last 100 years, which can lead to a deep and long-term recession in many countries.

However, there are differences between countries, regions and sectors of the economy. Comprehensive measures implemented by governments can help to deal with increased unemployment, target inflation, keep GDP at the optimal level, overcome the crisis and minimize the impact of it.

The restrictions introduced during the pandemic, for example, lockdown and self-isolation, closing trade and production, had a negative impact on the global economy [1]. People and economies will face the consequences of these restrictions for a long time [2]. Therefore, timely measures are required to overcome the crisis as soon as possible.

At the same time, public health measures are just as important as post-pandemic economic measures. Therefore, governments should add healthcare measures to their post-pandemic economy programs.

THE STATE OF ECONOMY OF DEVELOPLED AND DEVELOPING COUNTRIES

According to the report by Global Economics Intelligence (GEI) McKinsey, world economies were in recession at different time periods. Statistics show that since February, the economic situation has deteriorated sharply. The peak of pandemic in China was in January and February [3, 4]. The volume of production and services sank to unprecedented lows. Exports decreased by 17% compared to 2019. Europe and the USA did not experience such a negative impact. In Europe, the moderate economic growth observed at the beginning of 2020 was halted in March. The economic performance in India was mainly positive, but it plummeted after March 25, when the lockdown was introduced for the entire country [2].

Globally, from February 20 to the end of March 2020, stock market indices decreased by about a third (*Fig. 1*).

Along with measures taken to stop the spread of the coronavirus, governments and central banks applied mitigation measures to stabilize economies. Financial markets reacted positively, but remain sensitive to the number of reported cases and deaths as well as restrictive measures.

Among the government assistance programs being enacted to support businesses and citizens during the pandemic, the $ 2 trillion U.S. stimulus package stands out.

The European Central Bank (ECB) announced € 870 billion in quantitative easing. Attempting to prevent a credit crunch, the ECB also asked EU banks not to pay dividends to investors or buy back shares by the end of 2020. The European Parliament allocated € 37 billion to support small and medium-sized enterprises (SMEs) and the healthcare sector [2, 5].

The People's Bank of China announced a supply of an additional 550 billion yuan (about $ 78 billion) to the banking system. The US Federal Reserve System Board (FRS) decided to bring its policy rate near zero (0.00 to 0.25%) and announced $ 700 billion in quantitative easing [2, 5].

The spread of coronavirus and measures introduced to prevent it negatively affected the economies of different countries. These effects are uneven for different sectors of the economy, occur at different stages and vary by country.

RUSSIAN ECONOMY TODAY

According to the Federal State Statistic Service (Rosstat), in 2019 GDP in volume terms

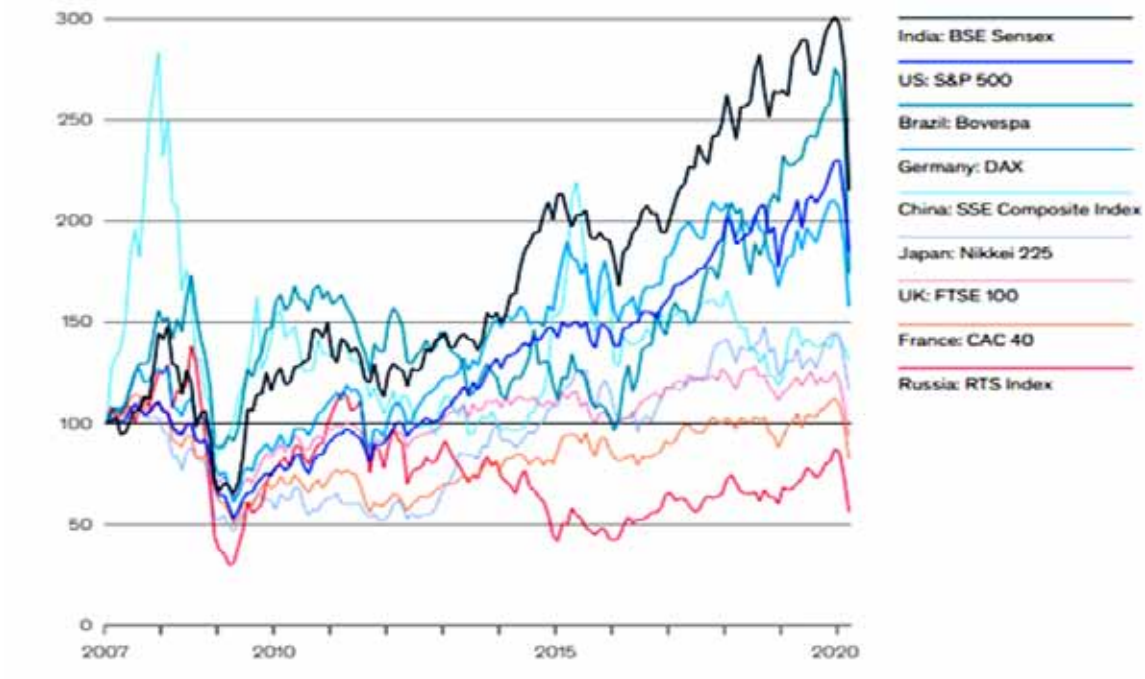


Fig. 1. **Status of stock markets for the period 2007–2020**

Source: FitzGerald A., Kwiatkowski K., Singer V., Smit S. [5].

fell by 1.3%. In the first quarter of 2020, the annual GDP growth rate was 1.5% according to the estimates of the Bank of Russia. In the second quarter annual GDP growth rates are likely to be negative due to the significant impact of restrictive measures on the Russian economy. The financial authorities assume that the restrictive measures will be lifted at the beginning of June, which will lead to the economic recovery. At the same time, the forecast shows GDP for 2020 falling by 4–6%[1] (*Fig. 2*).

However, this forecast does not consider the existing 5–7-year business cycle with the last crisis in 2014–2015 and, possibly, the next one in 2020–2021.

Unemployment is another significant indicator of the development of the economy. In March 2020, unemployment amounted to 4.6%[2] (*Fig. 3*), this was due to a decline in demand for labor. At the same time, the US unemployment rate was 14.2%. The IHS Markit PMI survey in March 2020 revealed a huge rise in unemployment numbers of the service sector. Other studies highlighted a part-time employment increase: the transfer of full-time employees to part-time jobs, unpaid leave, etc.

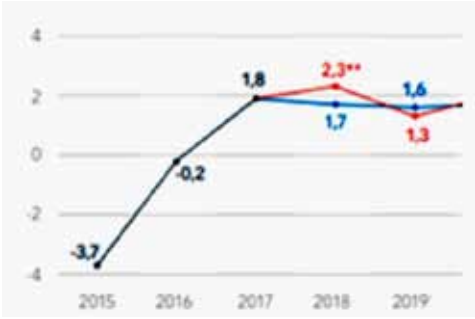
The considered indicators confirm the recession of the Russian economy. The decline is also illustrated by the inflation rate, which exceeded the baseline of 4% in March 2020. This was caused by a weak ruble and an increase in demand for food products, despite its decline in other goods and services.

Economic and business activity indicators show a deterioration of the Russian economy since March 2020 due to the coronavirus and the introduction of restrictive measures to prevent its spread.

In the medium turn, amid low demand for goods and services, the global and Russian economies will further slow down. In addition, the peak of the crisis will contribute to this during the 5–7-year business cycle in 2020–

[1] Bulletin of the Research and Forecasting Department of the Bank of Russia for April 2020 "Talking trends".

[2] Bulletin of the Research and Forecasting Department of the Bank of Russia for April 2020 "Talking trends". URL: https://cbr.ru/Collection/Collection/File/27780/bulletin_20–02.pdf (accessed on 11.05.2020).

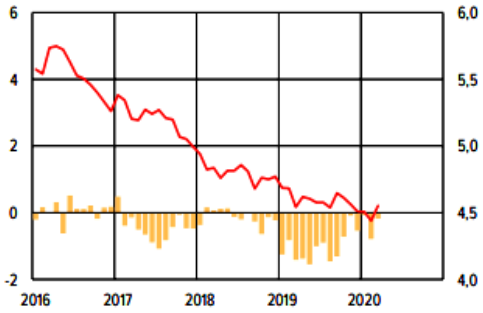


according to the IMF

according to the Ministry of economic development Russian Federation

Fig. 2. **GDP rate dynamics from 2015 to 2019, %**

Source: Banking system-2019: Proportional regulation and its practical application. URL: https://asros.ru/upload/iblock/e87/19081_bankovskayasistemarossii2019_proportsionalnoeregulirovanie.pdf (accessed on 12.05.2020).



labour force to the corresponding month of the last year, %

unemployment rate, % SA (right scale)

Fig. 3. **Unemployment rate and labour force dynamics from 2016 to March 2020, %**

Source: Bulletin "Talking trends" prepared by the Bank of Russia's Research and Forecasting Department, April 2020. URL: https://cbr.ru/Collection/Collection/File/27780/bulletin_20–02.pdf (accessed on 11.05.2020).

2021 on the downward wave of the Kondratiev cycle [6]. The recovery period, when the restrictive measures are lifted, will depend on economic policy measures as well as the financial stabilization efforts of the Bank of Russia. Currently, the government and the Bank of Russia are supporting the Russian economy. This requires a coordinated and comprehensive strategy adopted by the government and the financial market regulator.

MEASURES INTRODUCED IN DIFFERENT COUNTRIES TO PREVENT RECESSION

In modern conditions, central banks and governments are trying to support their economies introducing various measures (*Table 1*). They can be roughly divided into:

1. Fiscal policy measures to support sectors of the economy.
2. Monetary policy measures to support the financial stability of economies.
3. Targeted policy measures to support individuals and legal entities.

Thus, fiscal and monetary policy measures in different countries vary significantly depending on the development of economies, the business activity level, and GDP rate affected by the pandemic But they have one common feature — scale.

The package of measures is designed to maintain economic stability and minimize negative consequences for both industries and enterprises. According to the calculations of the Analytical Credit Rating Agency (ACRA), countries suggest allocating from 0.2 to 36.6% of GDP for this purpose as of April 20, 2020. In Russia, the fiscal package is 2.6–2.8% of GDP (*Fig. 4),* provided the total decrease of income, this amount exceeds 5.5% of GDP[3].

[3] Unprecedented fiscal packages used by leading countries to support business and people. URL: https://www.acra-ratings.ru/research (accessed on 19.05.2020).

Table 1

Monetary and fiscal policy measures as consequences of the pandemic

Country	Monetary policy measures	Fiscal policy measures	Targeted measures for individuals and legal entities
1	2	3	4
USA	• Rate decrease to 0.25%; • transaction limit increase; • launch of the FIMA Repo Facility program for 6 months to exchange U.S. Treasury securities for U.S. dollars; • easing credit conditions, etc. [2]	• Program to support healthcare; • $ 700 billion in quantitative easing; • program to buy back unsecured loans from enterprises; • cancellation of reserve requirements, etc.	• Measures to support citizens, etc.
EU [9]	• Weekly auctions at a reduced rate of –0.5%; • easing lending conditions for banks; • programs for the purchase of assets of financial and non-financial sectors in case of instability; • weakening requirements for liquidity and capital adequacy of banks; • cancellation of stress tests for banks, etc.	• Healthcare packages; • provided state guarantees; • tax deferrals; • use of the funds of the European Stabilization Mechanism Fund to support finance industries, etc.	• Subsidizing small and medium enterprises; • subsidizing incomes of the population, etc.
UK	• Rate reduced to 0.1%; • increase in the repurchase of government bonds by 3 times; • use of bills for payments by large companies; • cancellation of stress tests for banks, etc. [5]	• Tax holidays for business; • credit guarantees, etc.	• Funds for direct support of individuals and others.
Russia	• Base rate reduced to 5.5%; • sale of foreign currency in the domestic market as part of the implementation of the budget rule mechanism; • easing credit conditions for the trade sector, etc.* [8]	• Tax exemption for small businesses excluding VAT for the second quarter of 2020; • suspension of OFZ auctions "until the market is stable"; • measures to support the healthcare sector; • simplified deliveries from abroad and within the country, restrictions on cargo transportation in cities removed; • tax deferrals, etc.**	• Measures to support the population (child benefit); • program for lending to legal entities for the payment of wages to employees, etc.

Source: compiled by the authors.

* Implementation of support measures by the Bank of Russia is vital for maintaining the stability of the banking system. URL: https://www.acra-ratings.ru/research (accessed on 20.05.2020).

** Support measures for regional budgets. URL: https://www.acra-ratings.ru/research (accessed on 18.05.2020).

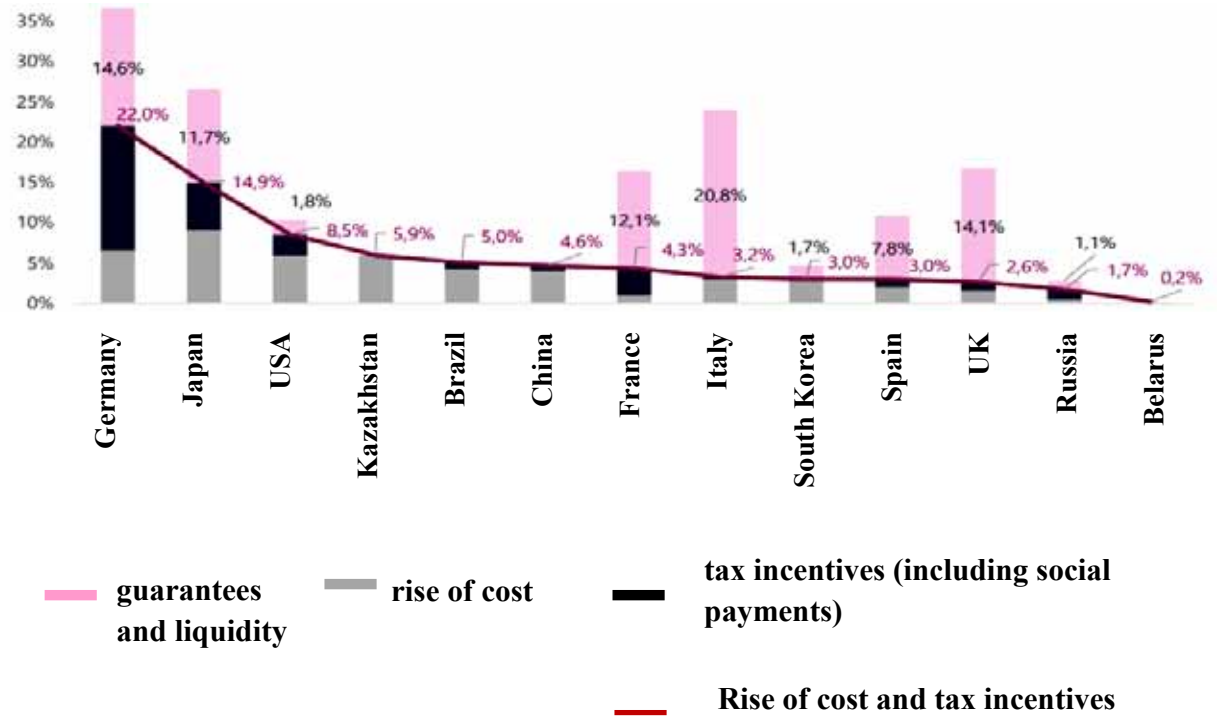


Fig. 4. **Fiscal packages of developed and developing countries in 2020**

Source: URL: https://www.acra-ratings.ru/research (accessed on 19.05.2020).

In most countries the package of measures is ensured by state guarantees. In addition, most central banks have lowered their base rates and expanded liquidity programs for commercial banks [9]. Countries with low base rates (Germany) or negative (Japan) mostly rely on fiscal policy as monetary policy measures will not be effective. Stricter public measures have been introduced in less economically stable countries.

However, it is necessary to develop additional measures in case of the second wave of coronavirus or long-term crisis, provided some countries have insufficient financial resources by that time.

THE FORECAST FOR THE WORLD AND RUSSIAN ECONOMY DEVELOPMENT REGARDLESS OF THE PANDEMIC

The base case scenario for the development of the Russian economy implies the cancellation of restrictive measures from June 2020 similar to China (2–2.5 months of quarantine); the financial authorities expect the start of economic recovery in 2022. This process will be supported by an increase in oil prices by $ 45 per barrel, an increase in GDP by 3.55%, the US Dollar/Russian ruble exchange rate at 70 rubles, a decrease in unemployment to 4.5% and in inflation to 3%, the balance of the federal budget will be estimated at 1.5% of GDP[4].

However, the base case scenario for Russia does not assume the fact that the spread of coronavirus will not end as soon as financial authorities expect. The next crisis within the business cycle of 5–7 years will be the reason to it (*Fig. 5*).

The governments' objective now is to eliminate any uncertainty as soon as possible. As we have seen in previous crises, when uncertainty subsides, the public confidence returns and the economy starts to recover. The level of uncertainty has been rated as the highest in 35 years, which may

[4] Analytical Credit Rating Agency. Official Website. URL: https://www.acra-ratings.ru/research/1769 (accessed on 19.05.2020).

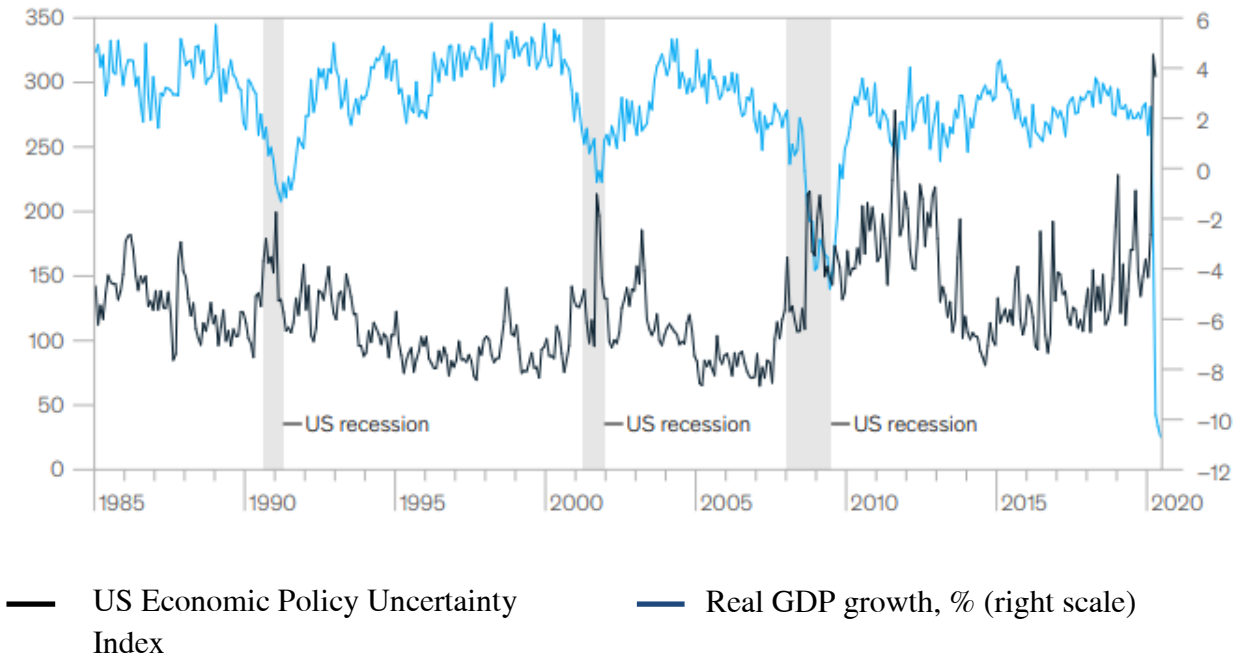


Fig. 5. **GDP cyclical growth from 1985 to present**
Source: Baker S.R., Bloom N., Davis S.J. [10].

indicate the onset of a global recession and a long-term crisis in many countries [11].

According to McKinsey & Company, from now to the end of 2023, the loss of global GDP will amount to about $ 15 trillion, given a high number of coronavirus cases in developed countries and "near zero-virus" situation in developing countries. The economic implications are expected to be more serious than from severe acute respiratory syndrome (SARS, 2003) and the Middle East respiratory syndrome (MERS, 2015). The current crisis is already seen as a "new great depression". Governments around the world must recognize that much work remains to be done and that they should prepare for the crisis after the recession [12].

ECONOMIC SCENARIOS OF THE COUNTRY DEPENDING ON THE PANDEMIC ACTIVITY

Amid the fast-moving pandemic and the response measures, economic forecasting has become uncertain. The Organisation for Economic Co-operation and Development, for example, canceled the March release of its forward-looking composite leading indicator [13].

Currently, most governments and central banks use a variety of measures to stimulate the economy and maintain financial stability. Unfortunately, according to forecasts, we will observe a significant drop in the level of GDP by 8–13% in the second quarter of 2020 [14].

The McKinsey Global Institute developed scenarios for the global economic recovery depending on the coronavirus spread (*Fig. 6*). A positive scenario anticipates economic recovery within a year, while a pessimistic scenario — within 5 years. The X-axis shows time, and the Y-axis shows GDP,%.

Fig. 6 illustrates scenarios for the world economy, depending on the coronavirus spread and a corresponding change in GDP.

According to the Fig. 6, there are four most favorable economic recovery scenarios that countries can follow — A1, 2, 3, 4 [2, 13, 14]:

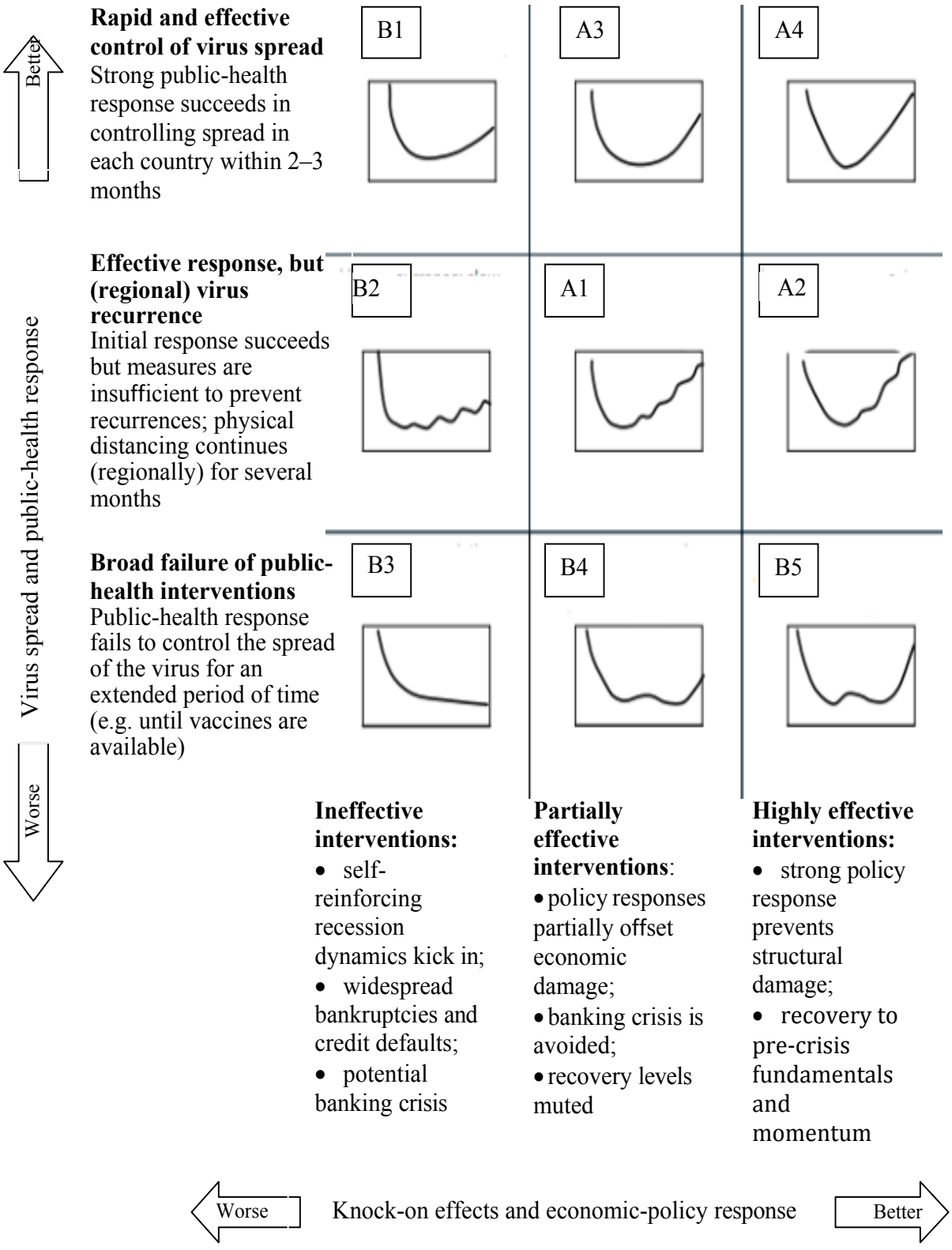


Fig. 6. **Scenarios for the world economy, depending on the coronavirus spread and the effectiveness of the government's measures**

Source: COVID-19: Briefing materials. Global health and crisis response, 2020. URL: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Risk/Our%20Insights/COVID%2019%20Implications%20for%20business/COVID%2019%20March%2025/COVID-19-Facts-and-Insights-March-25-v3.ashx (accessed on 17.05.2020).

- A1 — virus recurrence; slow long-term growth; muted world recovery;
- A2 — virus recurrence; return to trend growth; strong world rebound;
- A3 — virus contained; slow recovery;
- A4 — virus contained; strong growth rebound;
- B1, 2 — virus contained in the first case; virus recurrence with slow long-term growth in the second case;
- B3, 4, 5 — progression toward economic recovery varies depending on the virus spread.

CONCLUSIONS

Proactive measures are required to deal with a recession. Measures are effective when introduced at the beginning of a recession.

Proactive actions are important for the population. For example, during the recessions in the United States after World War II, there was a significant increase in unemployment. In the 2000s, the number of unemployed increased by 7 million people (almost doubled) [15].

Historically and traditionally, the question was raised about the possibilities of fiscal policy in assisting the population. And this is what we are now observing: tax cuts and increased government spending.

According to New Keynesians and monetarists, monetary policy is still preferable in overcoming a recession, because it is more flexible and effective while deciding on the increase in government spending and tax reduction takes time. Taxes and government spending issues need to be approved by governments. For example, in Russia they must be approved by the State Duma and the Federation Council, in the United States by the US Congress and Senate. This is much slower than the actions of the central bank to change rates, which affects the demand in the economy.

In addition, there are volatility losses, i.e., the more unstable the economy, the slower its growth.

On the other hand, there is a negative side to the proactive policy of central banks due to the existence of two lags. The first lag is between the decision to change politics and the shock. Typically, a recession slowly seeps into the economy and business activity and the shock is not immediately visible.

The second lag occurs between the changed rates and the reaction of the economy. The central bank does not influence the process instantly, since credit organizations may not want to immediately expand lending in response to lower rates. It will take some for the economy to react.

These two lags indicate that the central bank and governments face a challenging task. In addition, amid the pandemic, effective healthcare measures are important but still insufficient.

According to G. Mensch, "innovations overcome the depression." It is only possible to revive the global economy when a group of basic innovations of the new sixth wave is formed. It is likely that in 2025 the economy will start to recover amid the rising wave of the sixth Kondratiev cycle, which will last until 2045 [6]. Significant changes in education and labor law are also required for a faster economic recovery.

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Volodin V. M. — conceived and designed the study, developed the conceptual framework, performed the analysis of sources.
Petrova L. A. — interpreted and described the results, wrote the conclusions.
Kuznetsova T. E. — collected statistical data, designed tables and graphical representations.

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Country Attractiveness: Analysis of the Main Factors

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ABSTRACT

Attracting investment is a **relevant** issue for any economy. The **aim** of the research is to study the factors affecting the inflow of foreign direct investment (FDI) by the example of countries leading in attracting FDI and countries of the Eurasian Economic Union (EAEU). The author uses both qualitative and quantitative **methods** to analyze research data of other authors, reports of international organizations and the World Bank database. The author did econometric calculations using the application package Stata 14. A linear regression model using the least-squares method was built. The author selected several factors that presumably affect FDI inflows to the EAEU countries. The calculations were based on the combined panel data analysis model used in the BRICS and MINT countries, which allowed the author to calculate the degree of influence and significance of a number of variables of FDI inflows. The study shows that political stability is more important than the inflation rate, the volume of foreign trade and final consumption expenditure. The author **concluded** that poor institutional development hinders investment. In particular, the negative institutional factors are non-transparent regulation policy, the dominance of public property and the lack of proper investment protection system, low degree of rule of law and limitation of economic rights. Further study of issues related to attracting FDI should consider the trends of mass digitization since the introduction and implementation of digital technology are becoming an integral part of the competitiveness of the modern economy.

Keywords: foreign direct investments; investment attractiveness; macroeconomics; open economy; competitiveness

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INTRODUCTION

With the rapid growth and development of digital technologies, maintaining the competitiveness of the economy requires constant injections of capital to finance and implement various innovations. Attracting foreign investment for this purpose has several positive sides: foreign capital expands the country's capabilities, brings new technologies and business culture. It is important to determine the factors influencing investors' decisions to increase the FDI inflows in a particular county. Obviously, a number of economic and political factors are crucial, as well as the level of institutional development of the country and some other qualitative indicators. The indicators that determine the investment attractiveness are the size of the market, population, openness of the economy, macroeconomic stability, political stability, development of various economic and political institutions. A study of the list of countries successful in attracting FDI by various comparable indicators made it possible to identify economies leading in two or more indicators. These include Singapore, Hong Kong, Australia, and the Netherlands. In this regard, one of the questions of this study was the search for those factors that determine the leadership of these economies.

The statistical data allowed us to identify the economies of the countries leading in FDI, which differ from each other and contradict the results of a number of studies. In particular, they differ significantly in absolute indicators of population and market capacity, in the degree of economic openness, in territory and population density. The indicators assessing political stability and economic freedom also differ. However, some factors are similar in all four countries and are dominant in terms of investment attractiveness. Other common factors include strengths highlighted by analysts at the World Economic Forum: macroeconomic stability, a strong financial system and infrastructure, and a skilled workforce. As for the latter indicator, it should also be noted that in all these countries, more than half of the population speaks English. Studying the experience of leading economies in attracting FDI allows us to formulate the following research question: Do the selected factors affect the attraction of foreign direct investment to the EAEU countries and which of them are the most significant?

Statistics show that in terms of the relative volumes of net FDI inward flows, the EAEU countries do not lag behind a number of developed countries, which cannot be said for FDI per capita. At the same time, the relatively low volumes of attracting foreign investment may be a result of a number of factors also noted in the Global Competitiveness Report. In particular, according to the Global Competitiveness Index, the skillset of graduates, the quality of road infrastructure was assessed at an average level, and the ease of finding skilled employees was slightly above average. The efficiency of the border clearance was assessed below average, which, with other indicators being on the same level, may negatively affect the investment decisions of foreign investors. In addition, the indicators of economic freedom (Belarus, Kazakhstan, Kyrgyzstan, and Russia are classified as moderately free countries, Armenia is classified as free) are quite low compared to countries at high levels of FDI inward flows, and the indicators of political freedom are significantly low. In general, the analysis of investment attractiveness in the EAEU countries allows us to conclude that the presence of a number of favorable factors, despite other factors are at the same level, the ineffective activity of the institutions of economic and political regulation is a circumstance that hinders the growth of investments. Based on the analysis and generalization of a number of studies devoted to the search and assessment of factors affecting the investment attractiveness of the country, several factors were selected that presumably affect the inflow of FDI to the EAEU countries. The basic model for the calculations was a combined panel data analysis model applied to the BRICS and MINT countries [1], which allowed the authors to calculate the degree of influ-

ence and significance of a number of variables on the volume of FDI inflows. Thus, the article presents a literature review that allows us to identify all possible factors that determine the inflow of FDI and based on the statistical data, the countries with high volumes of FDI are identified. Studying the experience of these countries allowed us to determine which factors prevailing in the literature determine the inflow of foreign direct investment into these economies, and which do not.

METHODOLOGICAL BASIS OF RESEARCH

This study is aimed at solving the following problems.:

- modern literature review on the analysis of factors affecting FDI inward flows in order to identify the most significant ones;
- statistical analysis of the selected factors using the example of countries leading in FDI inward flows;
- study and assessment of the impact of the identified factors on the inflow of investments to the countries of the Eurasian Economic Union (EAEU).

The object of the research is foreign direct investment, the subject is the factors that determine the inward flow of investment. The research is based on the use of both qualitative and quantitative methods of analysis. The qualitative analysis is based on modern research on the factors that determine FDI in general and on the example of individual countries. The quantitative analysis is based on international organizations' reports (World Investment Report 2019, Global Competitiveness Report 2019), World Bank databases, official websites of statistical services, and other relevant organizations. The econometric calculations were carried out using the Stata 14 application package.

A comprehensive study of the factors of investment attractiveness for a group of leading economies ensures a novelty of this research as well as a calculation of a panel data analysis model to assess the degree of influence and significance of a number of variables on the FDI inward inflows in the EAEU countries.

The theoretical significance of the study is presented in an extensive quantitative and qualitative analysis and a detailed comparison of the factors of investment attractiveness of the EAEU countries leading in FDI, taking into account the competitiveness indicators.

The practical significance of the study concerns the creation of a statistical and analytical base for future study of the new factors affecting the inflow of FDI to these countries, in particular, factors driven by the formation of the digital economy.

LITERATURE REVIEW

Attracting FDI is always relevant and therefore there are many studies devoted to the analysis of factors increasing FDI flows into the country. Depending on the specifics of the sample and the subject of research, various indicators of investment attractiveness are distinguished with an appropriate degree of investment sensitivity to each of them.

The economic literature identifies the factors influencing the investment attractiveness of a country:

- market size;
- degree of urbanization;
- level of human capital development;
- level of economic integration;
- trade;
- labour cost;
- exchange rate volatility;
- political stability, etc. [2–4].

A review of determinants of FDI conducted by S. Tocar, shows that market size and infrastructure facilities have a positive impact on the foreign investment, while the level of salaries, corruption, corporate tax rates and political risks have a negative correlation with FDI inflows [5, p. 188].

Studying the FDI volumes in sub-Saharan economies, P. Jaiblai and V. Shenai tested the hypothesis about the influence of the following factors on investment inflows: inflation, economic openness, exchange rate volatility,

infrastructure, market size, and income level. Based on the results of econometric calculations in the long term, the authors identified a significantly positive effect of inflation and infrastructure, and insignificant but positive effect of the exchange rate and economic openness, and a negative effect of income level and market size [6, p. 13–15].

S. Boga conducted his research in the same region, analyzing such variables as the economic growth rate, foreign trade turnover, the degree of financial sector development, inflation, infrastructure, and the availability of natural resources [7].

A. Ridzuana et al. using the example of the countries of the Association of Southeast Asian Nations (ASEAN-5), built an equation of the dependence of FDI on economic growth, domestic investment, foreign trade turnover, expenditures on the final consumption of goods and services and the level of development of the financial sector [8, p. 158].

N. Mamingi et al. added the indicator of telephone lines per 100 people as an indicator of infrastructure development to the same macroeconomic factors on the example of the countries of the Eastern Caribbean region [9, p. 87].

In the context of general studies of investment attractiveness, A. Cieślik stands out, who studied the dynamics of FDI inflow to Poland from the EU-15 countries, using such indicators of comparisons between countries as the ratio of physical and human capital to the number of employees, the geographical distance between the capitals of the two countries and a number of other indicators [10].

G. O'Meara analyzed the dependence of FDI on the example of 99 countries for the following indicators: GDP per capita, income tax, volumes of exports of goods and services, education, household expenditures on final consumption as an indicator of total demand, etc. [11, p. 4–7]. The econometric analysis led the author to the conclusion that the population, GDP per capita, household final consumption expenditure, and broadband coverage of the country are statistically significant for the foreign investment flows, while education and corporate tax rate are insignificant.

K. Dellis et al. studying FDI flows in the EU countries, focused on the quality of institutions, considering this factor not only as key for investors but also as a factor influencing a number of other indicators of economic development that attract potential investors. The authors' research was aimed at studying the influence of political institutions, the labor market and the market for goods and services regulations, as well as a number of other regulatory mechanisms on FDI inflows, for which the global competitiveness index and Heritage and the Fraser Economic Freedom were taken [12, p. 8–14]. To assess the quality of institutions, the indicator of the World Governance Indicators database was taken. At the same time, the equation of dependence of FDI included such indicators as the volume of nominal GDP, as well as the percentage ratio of state tax revenues and the volume of foreign trade turnover in relation to GDP. The authors' research has confirmed the importance of quality political and economic institutions for attracting FDI.

J. Günther, M. Kristalova noted the importance of having effective functioning institutions of economic regulation, especially for economies in transition [13]. While recognizing the priority of such factors as market size, labor costs, and the degree of integration into the global economy, the authors emphasize the institutions that continue to remain underdeveloped in the countries of Central and Eastern Europe.

The impact of institutional development on FDI inflows was also discussed by S. Sabir, A. Rafique, K. Abbas [14], and N. Mahmood et al. [15], emphasizing that the role of institutional development in some cases is no less important than a number of macroeconomic factors. The same idea is expressed in the works of A. Cieślik, G. Hien Tran [16], M. Asiamah, D. Ofori, J. Afful [17], M. Epaphra, J. Massawe [18] and a number of other authors. Thus, S. Sajilan et al. included in the list of explana-

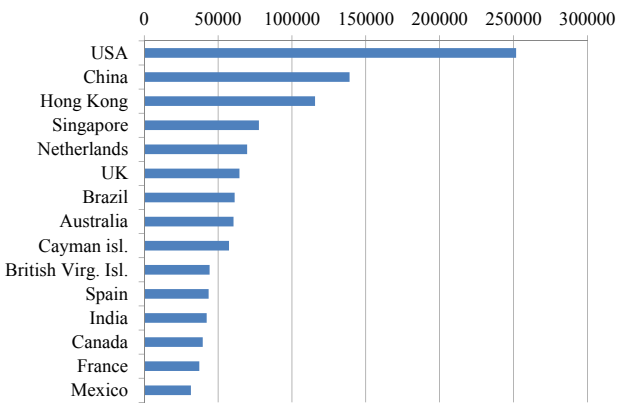

Fig. 1. **The countries with the highest FDI, bln USD**

Source: Based on the UNCTAD World Investment Report 2019.

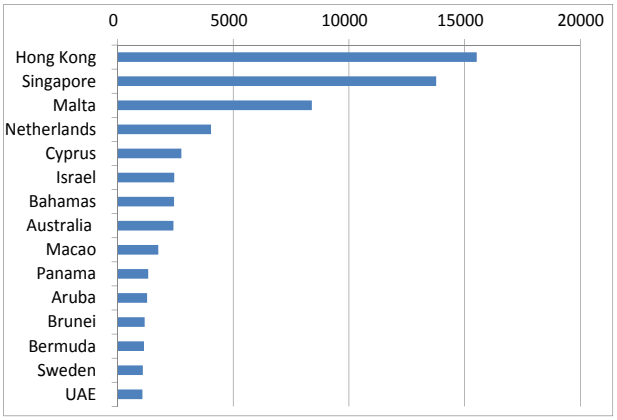

Fig. 2. **The countries with the highest FDI per capita, USD**

Source: Based on the UNCTAD World Investment Report 2019 and World Bank database.

tory variables such factors as government stability, transparency of democracy, corruption, and the quality of bureaucratic procedures [19, p. 469]. Some experts cite the availability of natural resources as the factor attracting investment, which contradicts the opinion of S. Poelhekke et al. that countries deprived of resources attract more FDI than resource-rich economies [20, p. 1].

In turn, H. Löwendahl emphasizes the need to promote investments, which implies creating a brand, raising awareness and perception of the country by potential investors [21].

A website and a separate structure responsible for promoting the country in the context of attracting investment is a very significant marketing tool. Trends in the development of the modern global economy adjust to the existing relationships, as well as the attractive business environment. The fourth industrial revolution, driven by the rapid development and adoption of digital technologies, involves a revision of the process of creating and distributing value, which effectiveness largely depends on the ability of enterprises to accept and implement digital technologies. [22][1].

The digital economy leads to the need to define new rules and adapt existing regulatory norms to them, and also creates new opportunities for business: the transformation of all sectors of the economy may lead to increased quality of production of goods and services at lower costs[2]. The transporting costs of digital products are close to zero, ensuring high geographic mobility of digital products compared to traditional manufactured goods. Thus, digital technologies are becoming a more significant factor of production relative to labor, land, and the availability of natural resources [23]. In these conditions, the country's potential for the introduction, use, and development of information and communication technologies (ICTs) becomes another factor that largely influences foreign investors' decisions. This factor is specifically important for internet-based enterprises[3]. Analysts at the World Economic Forum also recognize the role of digital technologies and their diffusion in shaping the competitiveness of the economy, as reflected in the Global Competitiveness Report, which is precisely the "voice of the business community" [24]. Based on the indicators included in the report, a number of new investment attractiveness factors can be identified that complement the list of traditional

[1] World Economic Forum. Global Future Council on Digital Economy and New Value Creation. URL: https://www.weforum.org/communities/the-future-of-the-digital-economy-and-society (accessed on 05.03.2020).

[2] UNCTAD. Digital Economy Report 2019, pp. xvi–xviii. URL: https://unctad.org/en/PublicationsLibrary/der2019_en.pdf (accessed on 05.03.2020).

[3] UNCTAD. World Investment Report 2017. Chapter IV. Investment and the Digital Economy. URL: https://unctad.org/en/PublicationChapters/wir2017ch4_en.pdf (accessed on 05.03.2020).

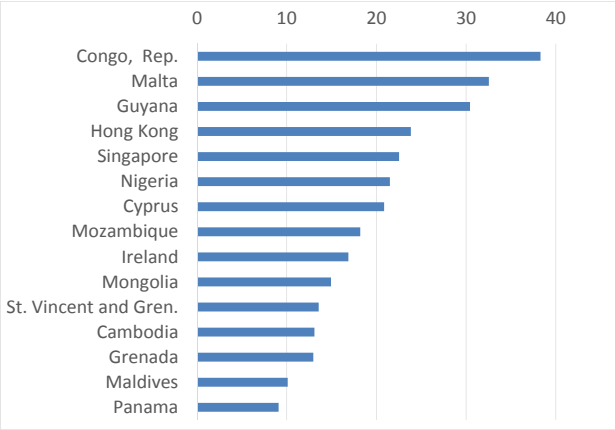

Fig. 3. **The countries with the highest FDI net inflows, % of GDP**

Source: Based on the World Bank database.

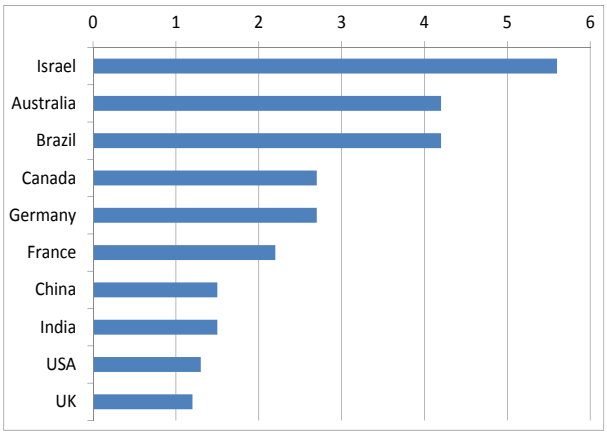

Fig. 4. **FDI net inflows, % of GDP**

Source: Based on the World Bank database.

indicators listed above. New factors include indicators such as technology governance, ICT adoption (with several indicators reflecting the expansion of ICT), digital skills of the active population, and a number of other indicators.

FACTORS OF INVESTMENT ATTRACTIVENESS OF COUNTRIES SUCCESSFUL IN ATTRACTING FDI

According to the 2019 World Investment Report, the top 20 countries can be identified as recipients of foreign direct investment. As a comparable indicator, we calculated the volume of investment per capita, which allowed us to see a different picture. The list of countries with the highest FDI inflow is diverse. This list includes economies that differ in many indicators. Only Hong Kong, Singapore, the Netherlands, and Australia lead on both indicators (*Fig. 1–3*).

FDI-to-GDP ratio is often used to assess FDI volumes. The list of countries — leaders in this indicator according to the World Bank — also differs from the mentioned above. The undisputed leaders included in all three lists are Hong Kong and Singapore (*Fig. 1–3*). Some of the world's largest economies are significantly behind in terms of the share of FDI in GDP (*Fig. 4*).

Summing up the above statistics, we can distinguish four countries successful in attracting FDI: Australia, Hong Kong, the Netherlands, and Singapore, which are compared in relation to a number of indicators as presented in the Global Competitiveness Report (GCR) (*Table 1*).

The data show that for most of the investment attractiveness indicators listed above, Hong Kong is close to the maximum values, while Australia shows indicators at a level slightly above the average score. At the same time, Singapore is the leader in the overall competitiveness rating among 141 countries, while Hong Kong and the Netherlands are ranked as third and fourth. And Australia is in 16th place in the ranking. It is notable that the United States, which is ranked third, is behind in some FDI indicators.

GCR analytics revealed the strengths of each of the economies:

- **Australia**: macroeconomic stability, skills, developed financial system. The infrastructure is the weakness. In many respects, the country's economy is similar to the average indicators of the OECD countries [24].
- **Hong Kong**: macroeconomic stability, financial system, and commodity market, infrastructure, ICT implementation. The disadvantages of the economy are limited potential, as well as low indicators for the protection of the workers' rights [24].
- **The Netherlands**: the country's economy in terms of the index is the most competitive in Europe and has an advantage in most components, in particular, in terms of macro-

Table 1

The factors of FDI attractiveness in the most attractive countries

	Australia	Hong Kong	Netherlands	Singapore
Property rights	6.1	6.2	6.1	6.4
Quality of road infrastructure	4.9	6.1	6.4	6.5
Inflation	2%	1.9	1.5	0.5
Skillset of graduates	4.8	5.1	5.5	5.4
Ease of finding skilled employees	4.6	4.9	4.8	5.1
Extent of market dominance	4.3	4.9	5.2	4.8
Competition in services	5.2	6.2	5.9	5.7
Prevalence of non-tariff barriers	5.3	6	5.3	6
Complexity of tariffs	6.9	7	2.9	6.9
Border clearance efficiency	3.9	3.8	3.9	3.9
Cost of starting a business % of GDP per capita	0.7	1.1	4.2	0.4

Source: Based on the WEF Global Competitiveness Report 2019, p. 66.

economic stability, quality of infrastructure, skills of qualified labor resources, developed innovation ecosystem and institutional environment.

- **Singapore**: an economy that has surpassed the United States in terms of its indicators. The strong points are infrastructure, labor market, financial system, macroeconomic stability, quality of public institutions. Additionally, Singapore has the most open economy.

At the same time, the countries differ significantly in terms of absolute indicators of market capacity and population. The final consumption expenditure in Singapore accounts for less than half of GDP, which indicates a rather low level of domestic demand, especially when compared to the other three countries. Singapore and Hong Kong, which are notable for their low population, are leading in one of the key indicators of economic openness — the volume of foreign trade, which is more than three times the country's annual output (*Table 2*), and in terms of the share of exports[4].

The United States, one of the Netherlands' main trading partners[5], notes that the strengths of the Dutch economy, which in-

[4] The World Bank. Export of Goods and Services. URL: https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?most_recent_value_desc=true (accessed on 05.03.2020).

[5] OECD. Netherlands. Trade and investment statistical note. URL: http://www.oecd.org/investment/NETHERLANDS-trade-investment-statistical-country-note.pdf (accessed on 05.03.2020).

Table 2

Macroeconomic indicators of investment attractiveness of countries leading in attracting FDI

	Australia	Hong Kong	Netherlands	Singapore
Market size, GDP (PPP), USD million, 2018*	1 291 189.88	481 309	970 604.94	572 503.97
Population, thousands, 2018**	24 992.37	7415	17 231	5638
Final consumption, % of GDP, 2018***	75.1	78.2	68.4	45.5
Foreign trade turnover, % of GDP, 2018****	43	377	158	326
Political stability and absence of violence/terrorism *****	82.86	74.76	78.10	98.57
Economic freedom index******	82.6 (ranks 4th)	89.1 (ranks 2nd)	77 (ranks14th)	89.4 (ranks1st)

Source: Based on the World Bank database, The Worldwide Governance Indicators, 2020 Index of Economic Freedom.

Notes: * The World Bank. GDP, PPP. URL: https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?most_recent_value_desc=true (accessed on 05.03.2020).

** The World Bank. Population, total. URL: https://data.worldbank.org/indicator/SP.POP.TOTL?most_recent_value_desc=true (accessed on 05.03.2020).

*** The World Bank. Final consumption expenditure. URL: https://data.worldbank.org/indicator/NE.CON.TOTL.ZS?most_recent_value_desc=true (accessed on 05.03.2020).

**** The World Bank. Trade. URL: https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?name_desc=false (accessed on 05.03.2020).

***** The World Bank. Worldwide Governance Indicators. URL: https://info.worldbank.org/governance/wgi/ (accessed on 05.03.2020).

****** The Heritage Foundation. 2020 Index of Economic Freedom. URL: https://www.heritage.org/index/ranking (accessed on 05.03.2020).

crease its investment attractiveness, are political and macroeconomic stability, a highly developed financial sector, geographic location, skilled labor, and logistics. in terms of communications. Overall, the Netherlands is one of the largest recipients of FDI, accounting for 16% of all US outbound investment[6]. The United States as an investor country pays attention to a number of institutional features of the country and such indicators as the corruption perceptions and the global innovation index. The key components of the country's exports are chemical products and food and beverages, as well as the service sector, which has a large share of inward FDI[7].

[6] US Department of State. 2019 Investment Climate Statements: Netherlands. URL: https://www.state.gov/reports/2019-investment-climate-statements/netherlands/ (accessed on 05.03.2020).

[7] OECD. Netherlands. Trade and investment statistical note, p. 7. URL: http://www.oecd.org/investment/NETHERLANDS-trade-investment-statistical-country-note.pdf (accessed on 05.03.2020).

Singapore is one of the main recipients of US investments. At the end of 2018, the Netherlands ranked 4th in terms of FDI in the country, yielding unconditional leadership to the United States[8]. Singapore is attractive for U.S. companies primarily due to transparency, lack of corruption (according to the corruption perception index in 2019, Singapore ranked 4th with an indicator of 85 out of 100)[9], business-friendly laws and regulations, tax structure, intellectual property protections, customs facilitation, and well-developed infrastructure[10]. The financial and insurance services sectors are leading in attracting FDI to Singapore is (53.4% of total FDI inflows as of the end of 2018). The share of industrial production, wholesale and retail trade is 11.6 and 17.8%, respectively.

Australia, among the four countries, is fundamentally different in geographic location and population density. The country has the world's 2nd lowest population density after Mongolia with 3 people per 1 sq. km of land area as of 2018[11]. Thus, Australia has more prospects for extensive growth but is limited in terms of human resources. The United States is also the main investor for Australia[12], attracted primarily by the availability of natural resources and mining, followed by investment in real estate[13]. The Australian authorities cite economic stability, strategic location, expanding trade networks, as well as political stability and good governance as the main factors determining the country's leading position in the world in terms of attracting FDI[14].

A robust legal services sector is a distinctive feature of the Hong Kong investment climate that attracts many international companies to locate their offices outside the country of origin in Hong Kong[15]. The high FDI inflows are mainly attributable to the Belt and Road Initiative and the fact that Hong Kong operates under a "one country, two systems" principle, given that Hong Kong is legally a Special Administrative Region of China. At the same time, the Hong Kong authorities are pursuing a policy of developing innovation and technology, attracting and implementing large volumes of investment in research and development, as well as in the development of the financial services sector. The attractive features of the Hong Kong economy for foreign investment include a business-friendly tax climate, political stability, freedom of the press, skilled labor, and a favorable geographic location[16]. Among the weaknesses are the high costs of real estate (including rental of premises for offices, shops, etc.) and labor, as well as a high degree of dependence on the financial sector. The main investments in Hong Kong come from China, some offshore zones, the UK, the Netherlands, the USA, and Japan.

[8] Singapore Department of Statistics. Foreign Direct Investment in Singapore 2018, p. 2. URL: https://www.singstat.gov.sg/-/media/files/publications/trade_and_investment/fdi2018.pdf (accessed on 05.03.2020).

[9] Transparency International. Corruption Perception Index 2019. URL: https://www.transparency.org/cpi2019?/news/feature/cpi-2019 (accessed on 05.03.2020).

[10] US Department of State. 2019 Investment Climate Statements: Singapore. URL: https://www.state.gov/reports/2019-investment-climate-statements/singapore/ (accessed on 05.03.2020).

[11] The World Bank. Population Density. URL: https://data.worldbank.org/indicator/EN.POP.DNST?most_recent_value_desc=true (accessed on 05.03.2020).

[12] Australian Government. Department of Foreign Affairs and trade. Statistics on who invests in Australia. URL: https://www.dfat.gov.au/trade/resources/investment-statistics/Pages/statistics-on-who-invests-in-australia (accessed on 05.03.2020).

[13] US Department of State. 2019 Investment Climate Statements: Australia. URL: https://www.state.gov/reports/2019-investment-climate-statements/australia/ (accessed on 05.03.2020).

[14] Australian Government. Department of Foreign Affairs and trade. Australia remained in the top ten global destinations for FDI in 2017. URL: https://www.austrade.gov.au/international/invest/investor-updates/2018/australia-remained-in-the-top-ten-global-destinations-for-fdi-in-2017 (accessed on 05.03.2020).

[15] The Government of the Hong Kong Special Administrative Region. Invest HK. Quarterly Newsletter. April, 2019. URL: https://www.investhk.gov.hk/sites/default/files/2019.04-newsletter-en.pdf (accessed on 05.03.2020).

[16] Nordea trade portal. Country profile: Hong Kong. URL: https://www.nordeatrade.com/en/explore-new-market/hong-kong/investment (accessed on 05.03.2020).

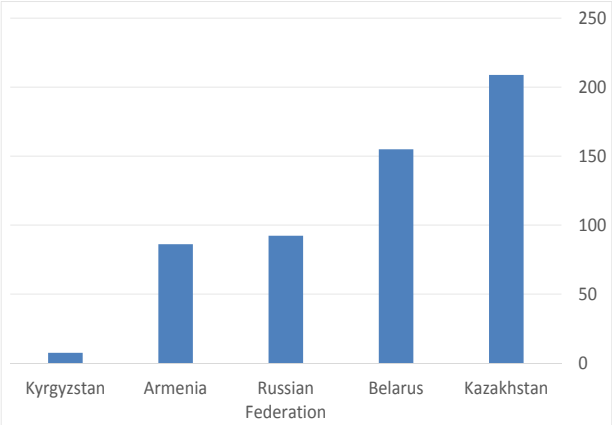

Fig. 5. **FDI per capita in EAEU, USD, 2018**

Source: Based on the UNCTAD World Investment Report 2019 and the World Bank database.

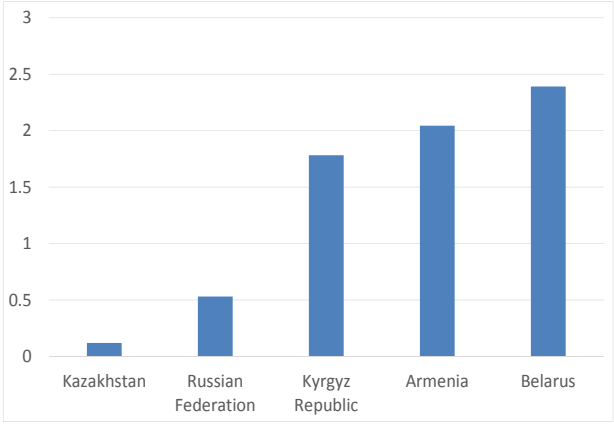

Fig. 6. **FDI net inflows in EAEU, % of GDP, 2018**

Source: Based on the UNCTAD World Investment Report 2019 and the World Bank database.

FACTORS OF THE INVESTMENT ATTRACTIVENESS OF THE EAEU COUNTRIES

The main indicator of comparative analysis is the net FDI inflows share of GDP, which for most EAEU countries is at the same level as for the mentioned-above developed economies. In terms of the FDI share of the population, there is a noticeable lag behind the world's leading countries and a significant gap between countries within the integration bloc (*Fig. 5, 6*).

Kazakhstan and Belarus lead in the number of investments per capita, and Belarus and Armenia — in terms of the FDI as% of GDP. *Table. 3, 4* illustrate the extent of FDI inflows determined by the factors listed in this paper. In this context, the analysis is limited as data for Belarus are not available in the Global Competitiveness Report. Nevertheless, the available statistics allow us to identify a number of common patterns for all countries:

- the quality of roads infrastructure is assessed by respondents at the average level;
- the quality of the road connectivity in Armenia and Kyrgyzstan is significantly lower than in Kazakhstan and Russia;
- the skillsets of graduates are assessed at the average level;
- the border clearance efficiency was assessed at the level significantly below average.

In addition, it can be noted that the overwhelming majority of indicators for all the listed countries are rated below 5 out of the maximum 7.

Belarus, Kazakhstan, Kyrgyzstan, and Russia are moderately free countries, while Armenia is a predominantly free economy. At the same time, in terms of the OECD FDI regulatory restrictiveness index of EAEU countries[17], Armenia is leading with a final index value of 0.019, and Russia is the most closed for investment with a value of 0.257. [the index is calculated as an integral value of assessment for several sectors of the economy, in the range from 0 (openness) to 1 (closeness)].

Nevertheless, Armenia is slightly behind Russia in terms of FDI per capita and significantly behind Kazakhstan. According to UNCTAD, the share of FDI stock as of 2018, as a percent of GDP, amounted to 44% in Armenia, 35% in Belarus[18], 87.5% in Kazakhstan[19], 48.4% in Kyrgyzstan[20], 25% in Russia[21].

[17] OECD FDI Regulatory Restrictiveness Index. URL: https://stats.oecd.org/Index.aspx?datasetcode=FDIINDEX# (accessed on 05.03.2020).

[18] UNCTAD. Investment Policy Review: Armenia, p. 3. URL: https://unctad.org/en/PublicationsLibrary/diaepcb2019d3_en.pdf (accessed on 05.03.2020).

[19] UNCTAD. World Investment Report 2019. Country factsheet: Kazakhstan. URL: https://unctad.org/Sections/dite_dir/docs/WIR 2019/wir19_fs_kz_en.pdf (accessed on 05.03.2020).

[20] UNCTAD. World Investment Report 2019. Country factsheet: Kyrgyzstan. URL: https://unctad.org/Sections/dite_dir/docs/WIR 2019/wir19_fs_kg_en.pdf (accessed on 05.03.2020).

[21] UNCTAD. World Investment Report 2019. Country factsheet: Russian Federation. URL: https://unctad.org/sections/dite_dir/docs/wir2019/wir19_fs_ru_en.pdf (accessed on 05.03.2020).

Table 3

Factors of FDI attractiveness in EAEU countries

	Armenia	Kazakhstan	Kyrgyzstan	Russia
Property rights	4.8	4.4	3.5	3.7
Quality of road infrastructure	3.6	3.6	3.1	3.5
Inflation	1.7	6.7	2.4	3.3
Skillsets of graduates	3.7	3.8	3.2	4
Ease of finding skilled employees	4	4.1	3.6	4.5
Extent of market dominance	4.6	3.8	3.4	3.7
Competition in services	5.5	4.9	4.1	5.5
Prevalence of non-tariff barriers	4.4	4.5	4.1	4.1
Complexity of tariffs	4.2	4.3	3.6	3.7
Border clearance efficiency	2.6	2.7	2.8	2.4
Cost of starting a business % of GDP per capita	0.8	0.3	1.9	1.1

Source: Based on the WEF Global Competitiveness Report 2019.

According to the indicator of accumulated FDI for 2014–2017 in Armenia, Russia leads (42%) and followed by EU countries (20%)[22]. By the same indicator, the mining industry, housing, and real estate, and the public utility industry are leading among the sectors of the economy. At the same time, as of the end of 2018, Russia (63.8%) and the United Kingdom (19.7%) are leading in terms of net FDI inflows to Armenia, although in the previous two years there was a negative indicator of net FDI inflows from Russia[23]. The inward investments in Armenia largely depend on the representatives of the diaspora, who invest in emerging sectors. In general, the main industries attracting FDI for two decades have been mining, energy, banking, ICT, and real estate[24]. UNCTAD analysts highlight corruption, an ineffective judicial system, anti-competitive practices impunity, and a number of other institutional weaknesses, which, however, tend to change for the better.

The mining industry is traditionally the leading sector in attracting FDI in Kazakhstan (56.3% of total FDI as of 2018), followed by the manufacturing industry (14.3%). According to 2018 data, the main investors in Kazakhstan are the Netherlands (30.1%), the USA (23%), China (7%)[25]. The growth of oil production and service sector is the key driver for the economy of Kazakhstan.

[22] UNCTAD. Investment Policy Review: Armenia, p. 5. URL: https://unctad.org/en/PublicationsLibrary/diaepcb2019d3_en.pdf (accessed on 05.03.2020).

[23] Statistical Committee of the Republic of Armenia. External Economic Activity, p. 535. URL: https://www.armstat.am/file/doc/99516823.pdf (accessed on 05.03.2020).

[24] UNCTAD. Investment Policy Review: Armenia, p. 2. URL: https://unctad.org/en/PublicationsLibrary/diaepcb2019d3_en.pdf (accessed on 05.03.2020).

[25] The National Bank of Kazakhstan website. URL: https://nationalbank.kz/?docid=680&switch=russian (accessed on 14.04.2020).

Table 4

Macroeconomic indicators of FDI attractiveness in EAEU countries

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Market size, GDP (PPP), USD million, 2018*	30530.74	189658.43	509544.26	24535.04	4050785.54
Population, thousands, 2018**	2951.78	9483.50	18272.43	6322.80	144478.05
Final consumption, % of GDP, 2018***	92.7	69.5	58	99.2	66.7
Foreign trade turnover, % of GDP, 2018****	91	139	63	101	52
Political stability and absence of violence/terrorism *****	30.48	58.10	45.71	25.24	29.05
Economic freedom index******	70.6 (ranks 34th)	61.7 (ranks 88th)	69.6 (ranks 39th)	62.9 (ranks 81st)	61 (ranks 94th)

Source: Based on the World Bank database, The Worldwide Governance Indicators, 2020 Index of Economic Freedom.

*Notes:** The World Bank. GDP, PPP. URL: https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?most_recent_value_desc=true (accessed on 05.03.2020).

** The World Bank. Population, total. URL: https://data.worldbank.org/indicator/SP.POP.TOTL?most_recent_value_desc=true (accessed on 05.03.2020).

*** The World Bank. Final consumption expenditure. URL: https://data.worldbank.org/indicator/NE.CON.TOTL.ZS?most_recent_value_desc=true (accessed on 05.03.2020).

**** The World Bank. Trade. URL: https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?name_desc=false (accessed on 05.03.2020).

***** The World Bank. Worldwide Governance Indicators. URL: https://info.worldbank.org/governance/wgi/ (accessed on 05.03.2020).

****** The Heritage Foundation. 2020 Index of Economic Freedom. URL: https://www.heritage.org/index/ranking (accessed on 05.03.2020).

Exports of labor services, gold, and trade based on imports and re-exports are considered the drivers of economic growth in Kyrgyzstan. Accordingly, the main directions of foreign investment in Kazakhstan are oil, gas, coal and metals, and mining and construction[26].

In general, analysts cite the low cost of labor, the availability of natural resources, the potential of various sectors of the economy, large market size, and a number of other features as the factors of investment attractiveness of the Central Asian countries. The limiting circumstances are high exchange rate volatility, corruption, poor rule of law, and a non-transparent regulatory system[27].

The United States, Germany, and China are the biggest foreign investors in Russia[28], with manufacturing, trade, and mining be-

[26] Research and Knowledge Management Sector "Samruk Kazyna". Review of Investment Attractiveness of Central Asian Countries, p. 13. URL: https://sk.kz/upload/iblock/d34/d34cfc911970b45c9b695e392a7d250a.pdf (accessed on 12.04.2020).

[27] See above. p. 16.

[28] Statista portal. URL: https://www.statista.com/statistics/915431/leading-countries-investing-in-russia/ (accessed on 12.04.2020).

ing the most attractive for investment[29]. The United States, as one of the key investors in the Russian economy, cites fundamental structural problems of economic regulation –– in particular, judicial bias and, as a result, the vulnerability of investor rights, as well as corruption — among the main factors that reduce investment potential along with sanctions[30]. Analysts of the World Economic Forum note significant improvement of the macroeconomic climate in Russia, which helped to overcome the impact of the 2015 crisis, low inflation, and increased the innovative potential of the country (including the extent of ICT adoption). The negative aspects of the economy are the inadequate skillsets of graduates, the underdeveloped financial sector and insufficient access to financial resources for business[31].

Russia is the key FDI investor for Belarus, which accounted for 31% in 2019 and 55.4% of total FDI in 2019. In addition, 17.6% of FDI inflows were provided by Cyprus and 8.2% by Austria in 2019[32]. Investments are mainly made in the production and financial sectors (as of 2019)[33]. Nonetheless, FDI inflows into the country are constrained by the dominance of the state-owned enterprises and unwritten practices that may discriminate against the investors[34].

In general, a number of factors have been identified that negatively affect FDI in the EAEU countries. In most cases, these are ineffective institutions that provide investor protection, poor rule of law, and other quality indicators. It is also noted that the low efficiency of institutions largely depends on the quality of macroeconomic regulation in general. Below is a model for assessing the impact of some factors of investment attractiveness on FDI in the EAEU countries, taking into account political stability and the absence of violence/terrorism[35], which, as shown in the table, are at a fairly low level for all countries.

MODEL SPECIFICATION

Based on the analysis and generalization of studies devoted to assessing the impact of various factors of investment attractiveness on the inflow of FDI into the country, a pooled model was chosen to assess similar indicators for the EAEU countries. The model is based on a similar study for the BRICS and MINT countries by S. Asongu, U.S. Akpan, S.R. Isihak [1]. The sample consists of five EAEU countries and includes data for the 2009–2018 time period, covering the period after the 2007–2008 global financial and economic crisis until present time (subject to data availability). The choice of variables is ensured by similar research and data availability, for example, factors used in the Global Competitiveness Report are excluded from the analysis due to the absence of the data for Belarus. The net FDI inflow in absolute terms (according to the World Bank) was chosen as the explanatory variable.

Thus, the equation for assessing the factors of investment attractiveness of the EAEU countries includes such variables as:

- LNETFDI — logarithm of net FDI inflows in US dollars;
- lgdp — logarithmic GDP (PPP) per capita (as a level of a country's productivity);
- TRADE — foreign trade turnover (export and import) as a percentage of GDP;

[29] Compiled by author on the basis of data on the balance of payments of the Russian Federation, Q3 2019. URL: https://www.cbr.ru/statistics/macro_itm/svs/ (accessed on 12.04.2020).

[30] US Department of State. 2019 Investment Climate Statements: Russia. URL: https://www.state.gov/reports/2019-investment-climate-statements/russia/ (accessed on 12.04.2020).

[31] Schwab K. The Global Competitiveness Report 2019. Switzerland: World Economic Forum; 2019. URL: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf (accessed on 12.04.2020).

[32] National Bank of the Republic of Belarus. URL: https://www.nbrb.by/statistics/foreigndirectinvestments (accessed on 17.04.2020).

[33] Ministry of Economy of the Republic of Belarus. URL: https://www.economy.gov.by/ru/pezultat-ru/ (accessed on 17.04.2020).

[34] US Department of State. 2019 Investment Climate Statements: Belarus. URL: https://www.state.gov/reports/2019-investment-climate-statements/belarus/ (accessed on 12.04.2020).

[35] Worldwide Governance Indicators. URL: https://info.worldbank.org/governance/wgi/ (accessed on 12.04.2020).

Table 5

Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
lgdp	50	9.402 305	.7878436	7.913184	10.23566
LNETFDI	49	21.54895	1.829789	18.78687	24.96054
TRADE	50	87.81837	33.80055	46.19336	157.9743
INFL	49	9.133648	10.78244	–1.403608	59.21974
INET	48	49.63053	20.95837	15.3	80.86472
Cfinal	50	79.46328	18.15879	52.66706	115.9065
Tered	47	61.32182	18.08035	41.26702	93.54328
lpolit	50	3.465694	.4720913	2.625359	4.28375

Source: Author`s calculations.

• INFL — annual inflation rate based on the consumer price index;

• INET — a share of Internet users in the total population (as an indicator of the development of digital infrastructure);

• Cfinal — a share of final consumption expenditures in GDP (as an indicator of volumes of domestic demand);

• Tered — a share of those completing tertiary education in the adult population;

• lpolit — logarithm of the political stability index published annually by the World Bank regarding World Governance Indicators.

The source of statistics for all indicators, except the last one, is the World Bank database. Thus, the model for assessing the dependence of FDI inflows to the EAEU countries on the listed factors is as follows:

$$LNETFDI = \beta 0 + \beta 1 * \lg dpit + \beta 2 * TRADEit + \beta 3 * INFLit + \\ + \beta 4 * INETit + \beta 5 * Cfinalit + \beta 6 * Teredit + \beta 7 * lpolitit + \varepsilon it,$$

where *i* and *t* correspond to each specific country and time (all data are taken on an annualized basis).

Presumably, there is a positive relationship between the FDI inflows and the GDP per capita, the economic openness, the number of Internet users, the consumer spending, and the level of education in this formula. As for inflation, the relationship should be negative, since the price level is an indicator of general macroeconomic stability, and a consistently low price level attracts investors. The descriptive data of the EAEU countries are presented in *Table 5*.

The least squares linear regression model was built, based on the available statistical data and observations, using the econometric package Stata 14 (*Table 6*).

The results of the model with a coefficient of determination equal to 0.9774 (the adjusted coefficient is equal to 0.9729) lead to the following conclusions: all variables included in the calculation are statistically significant at the 5% significance level. At the same time, the rate of inflation is less significant compared to other variables included in the model. Also, political stability has the greatest effect on the volume of investments. Final consumption expenditure and economic openness have an adverse effect on the growth of FDI flows. By contrast, inflation is an indicator that has a positive effect on foreign investment. Thus, the calculations override the initial assumption that there was a positive effect of open-

ness on FDI flows and a negative effect of inflation on the investment attractiveness of a country. A similar contradicting result was obtained for the BRICS countries, while for the MINT countries, on the contrary, the effect of inflation was positive, and the effect of the volume of foreign trade was negative [1]. However, the impact of these two indicators on FDI inflows in the EAEU countries is almost half as much as the impact of indicators of the share of Internet users in the country and the share of people with higher education, which is in line with the findings of some of the empirical studies cited above.

CONCLUSIONS

The analysis of a number of studies devoted to the factors affecting the investment attractiveness of the country showed that, despite the obvious links between macroeconomic indicators, they manifest themselves differently in various economies. Most experts identify a number of general factors significant for attracting FDI: market capacity, population size, degree of economic openness, inflation, taxation, exchange rate stability, etc. However, practical analysis shows that the countries successful in attracting FDI differ significantly in terms of absolute indicators of market capacity, population, final consumption expenditures, and economic openness.

In most cases, institutional instability hinders foreign investment. The experience of the countries successful in attracting FDI and the EAEU countries showed that the effective functioning of institutions of political and economic regulation has a more significant effect than a number of macroeconomic indicators. In particular, the negative factors noted in a number of studies are non-transparent regulatory policies, the dominance of state ownership, and the absence of an adequate system for protecting the rights of investors, poor rule of law, and violated economic freedoms. The assessment of some factors of the investment attractiveness of the EAEU countries showed that the factor of political stability is more statistically significant than the inflation rate. Similar to the BRICS countries, the factor of foreign trade volume turned out to be negative, which can also be explained by the negative effect of the final consumption expenditures. High volumes of imports are reflected in final consumption expenditures and contribute to the country's foreign trade turnover indicating that the country's consumption is covered by external production. In general, the analysis based on the Global Competitiveness Report, the index of economic freedom and perception of corruption, allows us to conclude that the qualitative components of investment attractiveness prevail over the quantitative ones. Institutional factors are key to macroeconomic indicators. In most cases, macroeconomic factors are ensured by effective or ineffective institutions, while extensive factors of production, such as population size, large territories, or large volumes of accumulated capital, are not important. At the same time, future study of the problems of attracting FDI should take into account the trends of mass digitalization, since the introduction and expansion of digital technologies are becoming an integral part of the competitiveness of the modern economy.

Table 6

Results of model calculation

Dependent Variable: LNETFDI
Number of obs.: 43
Prob > F = 0.0000
R2 = 0.9774
R2 adj = 0.9729

Lgdp	Coef,	Std, Err,	P > |t|
TRADE	–.0052522	.0009634	0.000
INFL	.0030723	.0024803	0.224
INET	.0094807	.0014568	0.000
Cfinal	–.0178806	.0028211	0.000
Tered	.0081197	.001556	0.000
Lpolit	.2140023	.0634815	0.002
_cons	7.947582	1.007293	0.000

Source: Author`s calculations.

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The Development of Macroprudential Regulation of Bank Household Lending in Russia

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ABSTRACT

The article highlights the use of macroprudential instruments by the Bank of Russia that regulate the population lending of the Russian banking sector. **The purpose** of the work is to study the theoretical background and practical results of using indicators of the total cost of credit and the debt load of the population to ensure stability of the banking sector. The authors used **methods** of qualitative and quantitative analysis of scientific publications, regulatory sources, retrospective statistics. **The study showed** that initially, the regulator introduces new macroprudential instruments as recommended, and subsequently transfers them to mandatory. The regulatory mechanism is based on the ratio dependence of the bank capital adequacy on the actual values of the total loan cost and debt load of the borrower — individual. The mortgage debt to collateral value ratio supports the housing mortgage lending regulation process. The authors **concluded** that the banking sector's reaction to the introduction of the total credit cost indicator is more prominent than the introduction of the debt burden indicator. When the Bank of Russia obliged to take into account the full cost of the loan when measuring capital adequacy, banks were not able to increase capital; they reduced high-risk lending. The practice of macroprudential regulation of credit risks in the banking sector is complemented by the introduction of credit holidays for borrowers — individuals, who are struggling because of the pandemic. The obtained theoretical and practical **results** can be used in the development of the financial stability regulation practice in Russia, at the micro-level — when designing and changing credit policy.

Keywords: payment-to-income ratio (PTI); debt-to-income ratio (DTI); bank capital adequacy; macroprudential policy; household income; non-performing loans (NPL); loan loss provisions; pandemic

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INTRODUCTION

The stable functioning of the national banking sector ensures financial and macroeconomic stability in the country. By redistributing available resources from owners to borrowers, banks seek to ensure profitability at an acceptable level of risk. Households — the borrowers of the banking sector — are one of the most important counterparties. As of January 1, 2020, the balance of debt on household loans provided by Russian credit organizations amounted to 17,650.7 billion rubles, or 18.3% of the total assets of the banking sector (a year earlier, as of the beginning of 2019, indicated share amounted to 15.8% of total assets)[1]. Profit-seeking credit intermediaries expand lending by simplifying the requirements for potential borrowers, while not considering the ratio of income and payments of borrowers on loans. At the same time, some borrowers have outstanding loans in various banks, as well as outstanding obligations to non-credit financial institutions. The loan portfolio in Russia is growing mainly due to loans provided to individuals with medium and low income; a significant part of mortgage lending transactions is a consequence of the need [1]. In the segment of high incomes customers, an interest in investment products was noticed [2]. Moreover, one in five borrowers with unsecured consumer loans spends 80% or more of their income on loan payments[2]. Such borrowers are limited to manage their loans with their own income or do not have such an opportunity at all, and have overdue loans. They are constantly under pressure and look for additional sources of income, which leads to social tension. *Individual* lenders (a bank, other financial institution) may succeed in collecting debts from such borrowers and credit risk may not be realized, however, other creditors have to deal with late payments. Accordingly, lending to households without taking into account the ratio of the *total* amount of debt payments to household income threatens the financial stability of the banking and financial sectors, as well as the country's economy.

The aim of the paper is to study the theoretical background and practical results of using indicators of the true interest cost and debt burden of household loans to ensure the stability of the banking sector. To achieve this the evolution of sectoral macroprudential instruments in relation to bank household lending in Russia is defined; foreign experience in regulating bank household lending is generalized using indicators that consider the income of borrowers; The Russian practice of macroprudential regulation of bank household lending is analyzed using the true interest cost indicator (TIC) and payment-to-income ratio (PTI).

EVOLUTION OF SECTORAL MACROPRUDENTIAL INSTRUMENTS IN TERMS OF THE BANK HOUSEHOLD LENDING IN RUSSIA

Financial and banking macroeconomic stability issues are addressed by leading scientists and regulators [3]. Macroprudential policy is aimed at ensuring financial stability, which involves the use of prudential instruments to reduce systemic risk in the financial sector as a whole or in its segments [4]. The basis of macroprudential policy instruments was in the process of formation since the 1990s of the 20th century, however, there is a positive experience of regulation using separate instruments [5–7]. According to foreign researchers [8], the timely introduction of macroprudential policies in Italy, Germany and the UK before the crisis would have reduced the

[1] Review of the Banking Sector of the Russian Federation. URL: https://cbr.ru/banking_sector/statistics/ (accessed on 15.03.2020).

[2] Russian Banking Sector Developments in 2019. URL: https://cbr.ru/Collection/Collection/File/25854/razv_bs_19_12.pdf (accessed on 15.03.2020).

likelihood of its occurrence. Studying the practice of macroprudential regulation in the EU countries, C. Badarau, M. Carias, J.-M. Figuet revealed a positive effect of special reserves on bank capital and its elements, depending on various risk factors [9]. The use of macroprudential instruments aimed at borrowers has a special positive effect on financial stability [10, 11].

To prevent threats to financial and banking macroeconomic stability caused by household lending risks and considering the borrower's income by individual lenders only at micro-level and based on their estimates of the total debt burden of an individual, the theory and practice of macroprudential policy provide so-called sectoral measures. In particular, such measures in relation to the household lending sector may include limits on the volume or expansion of lending, special requirements for the lender's capital, requirements for lenders to calculate the indicators that limit the possible size of loan payments depending on the borrower's income.

The Central Bank of Russia, as sectoral measures of the implemented macroprudential policy, widely applies special capital requirements for banks — household lenders. The regulator determines the categories of household loans that carry increased risks for the banking and financial sectors of the economy. Increased risks are associated with unsecured loans, mortgages loans with a low share of own funds, loan payments, which make up a significant part of borrowers' incomes, as well as loans in foreign currency.

At the beginning of 2020, the share of household loans provided by the banking sector in foreign currency amounted to less than 0.5%[3] of the total household loan portfolio. In this regard, amid the ruble depreciation in March 2020, there is no reason for a sharp decline in the loan portfolio quality of banks.

Special capital requirements for lenders require the use of higher risk ratios when evaluating certain types of household loans. As known, in accordance with the generally accepted international methodology, the minimum capital adequacy is defined as the ratio of capital to total risks, multiplied by 100%. Provided risks form the denominator of the bank's capital adequacy standards, for the same amount of undesirable, in the opinion of the regulatory body, types of household loans with increased risk ratios, the creditor bank needs a large amount of equity (reflected in the numerator when defining capital adequacy standards).

Initially, since 2013, following the above logic, the application of increased capital requirements was determined by the value of the indicator of the true interest cost (TIC). The TIC indicator itself was introduced in Russia in 2008 to disclose the loan payment principal to the borrower to eliminate unfair banking practices. Later the role of the TIC indicator changed and it is used by the regulator to stabilize the unfavorable situation, characterized by excessive interest rates on household loans[4].

As of July 1, 2013, the Central Bank of the Russian Federation introduced a scale of increasing risk ratios for household loans, depending on the value of TIC. Loans with high TICs were distinguished by significant pressure on bank capital, which, given the banking sector's limited capabilities to increase equity, required a reduction in loans at high interest rates and, as a result, led to a decrease in average market rates for the bank household loans.

[3] Compiled by the authors on the basis of "Review of the Banking Sector of the Russian Federation". URL: https://cbr.ru/banking_sector/statistics/ (accessed on 15.04.2020).

[4] Inflated rates applied by some banks and non-credit financial institutions when establishing minimum requirements for borrowers' solvency or the complete absence of such requirements led to the formation of a low-quality loan portfolio and caused increased risks for the national banking and financial system.

Later, the norms of the Federal Law of December 21, 2013, No. 353-FZ "On Consumer Credit (Loan)" come into force, according to which the total cost of a household loan is currently estimated as in annual percentage terms and in monetary terms. The TIC calculation includes the amount of due interest on a contract; payments of the borrower in favor of the creditor provided for by the loan agreement, including payment for the issuance and maintenance of electronic means of payment; payments in favor of third parties stipulated by the contract at the rates applied by third parties; in some cases — the size of the insurance premium[5].

To estimate the total cost of a household loan as a percentage, payments of the borrower are calculated based on the established duration of the calendar year of 365 days.

The calculated TIC for a household loan of the borrower is compared with the average market value of the TIC in percent per annum, which is determined by the Bank of Russia as the weighted average of at least one hundred largest lenders of the corresponding consumer credit category or at least one third of the total number of lenders providing the corresponding category of the consumer credit (loan). As of July 1, 2014, at the time of conclusion of the contract, an individual TIC cannot exceed a minimum of two values: more than one third the average market price of the corresponding category TIC used in the calendar quarter, or 365% per annum.

Thus, in Russian practice, the initial use of the TIC in indirect macroprudential measures was supported by a legislative restriction on the interest rate on relevant household loans.

The consequences of the TIC indicator introduction and its use for financial stability, including banking, are assessed positively by the Central Bank of Russia[6]. The structure of the banking portfolio of household loans has changed: the share of loans with high TIC has decreased with the growth of the share of loans with reduced TIC. The decrease in the TIC helped to reduce the pressure of loan payments on borrowers' incomes, and to reduce the potential risks of the loan portfolio for the households, which positively (although with some lag) affected the financial stability of the banking sector.

The practice of macroprudential regulation of the credit sector is not limited to using the TIC indicator. Following an assessment of the Russian realities and relevant foreign experience, the Central Bank of the Russian Federation presented the analytical report on "Risk assessment of individual borrowers based on the debt burden indicator" in 2017. The report describes the coefficients used in other countries, which consider the income of borrowers in households lending.

The indicator "debt ratio" is used in foreign practices of macroprudential regulation of household lending. There are different approaches to calculate it. Depending on the calculation procedure, indicators such as DTI (or LTI) and PTI (PTI is also called DSTI and DSR) are used as a debt ratio.

DTI (debt-to-income) / LTI (loan-to-income) ratio is calculated as the ratio of the total loan debt to the *annual* income of the borrower, for example, in the UK, the borrower's LTI should not exceed 4.5.

PTI (payment-to-income) / DSR (debt servicing), DSTI (debt servicing-to-income) ratio is calculated as the ratio of the debt service amount to the total *monthly* income of the borrower, reduced by the total monthly expenses.

[5] "On Consumer Credit (Loan)" the Federal Law of December 21, 2013, No. 353-FZ URL: http://pravo.gov.ru/proxy/ips/?docbody=&nd=102170297 (accessed on 10.03.2020).

[6] Financial Stability Review. Information and analytical review. The Central Bank of the Russian Federation. No. 2 (15). 2019 Q2–Q3. URL: https://www.cbr.ru/publ/stability/ (accessed on 15.04.2020).

The value of the indicator of the debt burden of the households at the macro level varies considerably from country to country. According to the OECD[7], in 2018 the largest tax burden, defined as DTI / LTI, was noted in Denmark — 282%, in the UK — 141%, in the USA — 105%, in Germany — 95%, in Russia — 30%. According to foreign researchers, strict restrictions on the maximum ratio of debt services to household incomes determine the effectiveness of government lending policies [12, 13].

The tax burden indicators supported by special indicators aimed at limiting the relevant banking risks are used to regulate housing mortgage lending (HML). The indicators are LTV and CLTV.

LTV (loan-to-value ratio) is calculated as the ratio of HML debt to the collateral value. CLTV (combined loan-to-value ratio) is calculated as the ratio of the aggregate principal balances of all loans to the property's purchase price or fair market value.

Studying the consequences of using LTV and CLTV indicators in foreign countries allowed scientists to confirm that the value of the LTV coefficient is one of the most important predictors of the severity of losses [14]; CLTV is the most important factor determining the amount of credit risk [15]; introduction into practice of regulation of LTV and DTI indicators, as well as a change in their normative values, leads to a change in indicators of bank household lending [16]; the macroprudential restriction of the ratio of a loan to value reduces the negative impact of the crisis on GDP [17].

In Canada, the regulator has established additional debt burden indicators aimed at limiting HML risks: gross debt service ratio (GDS) and total debt service ratio (TDS). GDS is defined as the ratio of the main debt of the HML, interest, property taxes and heating costs to the total annual income of the borrower. TDS is defined as the ratio of the main debt of the HML, interest, property taxes, heating costs and payments of other debt obligations to the total annual income of the borrower.

In Russia, the mortgage loan segment is also affected by the applied sectoral macroprudential instruments of the Central Bank of the Russian Federation. To regulate the mortgage segment, the Bank of Russia uses two indicators at the same time: LTV and PTI, while TIC is taken into account when calculating PTI.

As of January 1, 2015, the Central Bank of the Russian Federation lowered the risk coefficient for low-risk mortgage loans. The following low-risk criteria were established for loans: LTV is less than 50% and PTI is less than 40%.

At the same time, the regulator relaxes the requirements for loan loss provisions (LLP) on mortgage loans without overdue payments, reducing the minimum level of provisions from 0.5% to 0.35%. The combination of macroprudential policies and requirements for bank provisions is widely used in the international practice of banking regulation [18].

Thus, as in the case of the introduction of macroprudential regulation of the TIC indicator in Russian practice, the PTI indicator is initially used in indirect regulation, since it affects different risk ratios when weighing debt on relevant loans.

RUSSIAN PRACTICE OF MACROPRUDENTIAL REGULATION OF HOUSEHOLD LENDING USING INDICATORS OF THE TRUE INTEREST COST AND DEBT BURDEN

Household lending is one of the developing segments of the domestic banking market. Household loans contribute to income received by individual lenders, and at the macro level, a potential threat to financial stability from excessive aggregate lending to individuals. In turn, the violation of financial stability negatively affects the wel-

[7] Household debt. URL: https://data.oecd.org/hha/household-debt.htm (accessed on 02.04.2020).

Table 1

Data on household loans provided by the Russian banking sector, beginning of 2020, %

Indicators describing household loans, including overdue debt	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Lending to individuals, as % of GDP	8.8	9.9	12.4	15	14.3	12.9	12.6	13.3	14.3	16.1
Lending to individuals, as % of banking sector assets	12.1	13.3	15.6	17.3	14.6	12.9	13.5	14.3	15.8	18.3
Lending to individuals, as % of household money income	12.6	15.6	19.4	22.3	23.9	20.1	19.9	21.7	25.5	28.5
Lending to individual's growth rate	14.3	35.9	39.4	28.7	13.8	-5.7	1.1	12.7	22.4	18.5
GDP growth rate	19.3	30.2	13.1	7.3	8.1	5.1	3.0	7.3	13.6	4.8

Source: Review of the Banking Sector of the Russian Federation. URL: https://www.cbr.ru/analytics/bnksyst/ (accessed on 12.03.2020).

fare of the population [19], the ability of financial intermediaries to meet the needs of the economy in cash [20].

The data on household loans provided by the Russian banking sector are presented in *Table 1*.

The data in *Table 1* show that in 2014–2015 there was a decrease in the share of household loans in GDP and banking sector assets due to a decrease in the volume of loans. This was caused by the unfavorable macroeconomic situation as a result of the imposed external sanctions, which was characterized by an increase in interest rates, inflation and the depreciation of the national currency. However, in 2016 there was an increase in the amount of individuals' debt on bank loans, which in 2017 reached the indicator of 2014 and almost doubled in 2018. The excess of the growth rate of individuals' debt over the growth rate of GDP (excluding 2015–2016), as well as the constant increase in the share of credit debt in the income of the households (except for 2016 and 2017), is assessed by the regulator as a threat to financial sta-

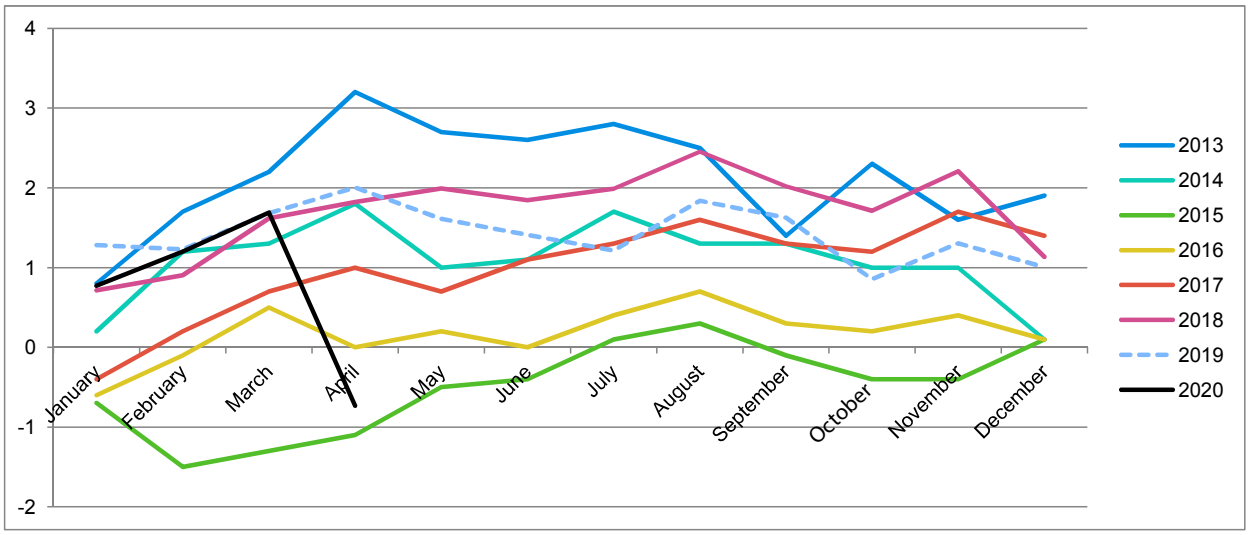

Fig. 1. **Monthly growth rate of household loans provided by the Russian banking sector, %**

Sourse: compiled by the authors based on "Review of the Banking Sector of the Russian Federation". URL: https://www.cbr.ru/analytics/bnksyst/ (accessed on 25.05.2020).

bility. These conclusions are supported by V.N. Alekseev and N.N. Sharkov [21].

In April 2012, the Central Bank of the Russian Federation published an assessment of the debt burden on household loans provided by the Russian banking sector. The indicator was calculated on the basis of the survey data provided by the largest banks and did not consider the **total** debt of borrowers with loans in various credit and non-credit financial institutions. The aggregate PTI ranged from 7.3 to 10.6% during 2012–2019, reaching maximum values at the beginning of 2015 and as of October 1, 2019 (10.4 and 10.6%, respectively). However, PTI for housing mortgage loans and PTI for other household loans differed significantly. According to the HML, PTI ranged from 0.7 to 1.7% and constantly increased in the analyzed period. For other household loans, PTI ranged from 6.6 to 9.3% (the maximum value at the beginning of 2015); as of October 1, 2019, PTI on other household loans was 8.9%[8].

To prevent risks associated with excessive household lending, from October 1, 2019, the Bank of Russia introduced a compulsory mechanism of increased pressure on the capital of household lending risks using increased ratios depending on PTI. The most important requirement for the calculation of PTI stipulated by the new regulatory mechanism was the need to account for **all** outstanding loans of the borrower to all credit and non-credit financial institutions; at the same time, the amount of debt was calculated with the inclusion of TIC. The introduction of the mechanism was announced in advance by the regulator, and the banking sector had time to adapt to changes. It was assumed that banks would adjust their lending policies: they would either limit or refuse to lend to borrowers with high PTI or take measures to increase their own funds. An assumption was also based on foreign studies [22]. The response of the Russian banking sector to the introduction of a regulatory mechanism using TIC and PTI is presented in *Fig. 1*.

The data in *Fig. 1* show that in January the volume of household lending was insignificant, except for 2015; in the first quarter, there was an annual increase in the growth of household loans provided by the domestic banking sector. At the end of

[8] Financial Stability Review. URL: https://www.cbr.ru/publ/stability/ (accessed on 15.04.2020).

the year (except for 2013 and 2015), on the contrary, there was a decrease in lending growth rates. In the third quarter of 2013, there was a sharp decrease in the growth rate of household loans provided by credit organizations, which was a consequence of the change in the TIC indicator as of July 1, 2013, from optional to mandatory when calculating the capital adequacy ratio. The decrease in lending to individuals at the beginning of 2015 was due to adverse events in 2014 that occurred in the fourth quarter of 2014 (changes in the exchange rate regime, depreciation of the ruble, growth in inflation, growth in arrears). The pre-crisis growth rate of household lending was recovering in 2015–2016, by 2017. There was no significant decrease in the growth rate of household lending in the 4th quarter of 2019, which was a reaction to the introduction of PTI as a mandatory macroprudential tool as of October 1, 2019, although a slight decrease takes place.

With negative growth in January, February and March 2020, bank loans to households grew at the same pace as in the corresponding months of 2019. However, in April 2020, positive growth rates turned negative (–0.7%). This was caused by the pandemic, not by the PTI regulatory mechanism.

The situation, characterized by a reduction in bank lending, including household loans, may lead to a banking crisis (in 2015, the monthly growth rates of the volume of household loans were negative, except for July, August and December). With a well-designed government policy to support business and citizens, as well as stabilization measures carried out by the financial mega-regulator, serious problems can be avoided and a stable banking system maintained. One of these measures was the introduction of payment holidays in Russia from April 2020[9].

In accordance with the current legislation, borrowers — individuals and individual entrepreneurs who have received loans for purposes not related to entrepreneurial activity — are eligible to apply for payment holidays. At the same time, the volume of loans is limited depending on the collateral for them: for consumer loans to individuals — 250 thousand rubles, to individual entrepreneurs — 300 thousand rubles; for consumer loans with a credit limit — 100 thousand rubles; for consumer loans for the purchase of a car with a car pledge — 600 thousand rubles. For loans secured by a mortgage, the loan amount depends on the place of residence. In general, the size of such loans is limited to 2 million rubles, for residential premises secured by a mortgage in Moscow — 4.5 million rubles, in the Moscow region, in St. Petersburg, and the Far Eastern Federal District –3 million rubles[10].

It is advisable to assess the consequences of the introduction of a mechanism of special capital requirements depending on the TIC and PTI for banking stability using the indicators of the financial stability of the banking sector.

The most important indicators of financial soundness (FSI) of depository institutions, characterizing the quality of assets, are the share of non-performing loans in the total volume of loans, as well as indicators characterizing loan loss provisions on non-performing loans. According to the IMF methodology, non-performing loans (NPL) are loans with payments overdue for 90 days

[9] Federal Law as of April 3, 2020 No. 106–FZ "On Amendments to the Federal Law 'On the Central Bank of the Russian Federation (Bank of Russia)' and certain legislative acts of the Russian Federation regarding the specifics of changing the terms of a credit agreement, loan agreement" URL: http://ivo.garant.ru/#/document/73842090/paragraph/1:0 (accessed on15.04.2020).

[10] Resolution of the Government of the Russian Federation of April 3, 2020 No. 435 "On establishing the maximum loan size for obtaining loans, according to which the borrower has the right to apply to the lender with a demand to change the terms of the loan agreement (loan agreement), providing for the suspension of the borrower's performance of his obligations" URL: http://ivo.garant.ru/#/document/73846652/paragraph/1:1 (accessed on 15.04.2020).

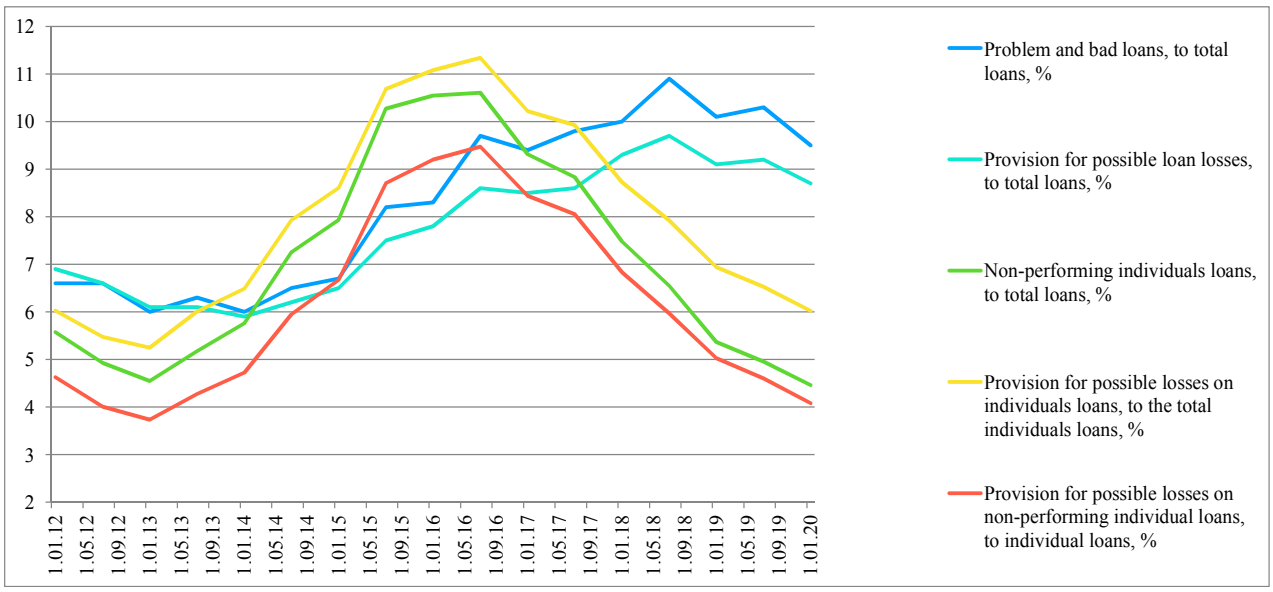

Fig. 2. **Macroprudential indicators of the credit risk of personal bank loans, %**

Sourse: compiled by the authors based on "Review of the Banking Sector of the Russian Federation". URL: https://www.cbr.ru/analytics/bnksyst/ (accessed on 20.04.2020).

or more. The data on the values of these indicators are presented in *Fig. 2*.

Fig. 2 shows that from July 1, 2013 (the date of entry into force of the regulatory mechanism with the obligatory use of the TIC value) for loans to individuals, the share of the loan loss provisions in the total volume of loans exceeded the corresponding indicator for all bank loans, which is due to additional fees in accordance with the introduced regulatory requirements. At the beginning of 2014, a similar excess of the corresponding indicator for total loans to individuals was noted for the share of non-performing loans in the total volume of household loans. Since 2015 — the share of LLPs for loans to individuals exceeded the credit risk indicators of the total portfolio of bank loans. The credit risk indicators' excess for loans to individuals over indicators for total loans provided by the domestic banking sector was noted until 2016. In the same period (2015–2016, especially at the beginning of 2015), Russian credit institutions were characterized by the slow growth of loans to individuals (see *Fig. 1*). In the first half of 2016, the credit risk indicator values for loans to individuals stabilized. During the second half of the same year and until 2020, the credit risk associated with lending to individuals decreased; the credit risk indicator values for loans to individuals since 2018 are lower than the corresponding indicator values for the aggregate bank loan portfolio.

When assessing the contribution of loans to individuals to the aggregate credit risk of the Russian banking sector during 2018–2019 it should be noted that this contribution is positive (it reduces the aggregate credit risk), since loans to individuals assessed using the regulatory methodology are less risky than the aggregate loan portfolio of the Russian credit institutions. A comparison of the dynamics of the share of non-performing loans to individuals and the share of LLPs on them in the total volume of household loans shows a positive trend. The values of these indicators are close, i.e. the share of non-performing loans to individuals covered by LLPs is close to 100%, which, given the worsening economic conditions (due to the self-isolation regime, termination of employment relationships amid coronavirus pandemic) will

prevent a sharp deterioration in the quality of the loan portfolio. Introduced payment holiday measures are also aimed at maintaining the current trend.

It is advisable to carry out an analysis of credit risk indicators on loans to individuals, considering insufficient loan loss provisions. The insufficient loan loss provisions are defined as the difference between the estimated and actual provisions. The regulator sets the requirements for calculating the amount of the estimated provisions. From the beginning of the analyzed period and until August 2017, these requirements were governed by the regulation of the Central Bank of the Russian Federation dated April 26, 2004 No. 254–P "On the procedure for making loss provisions by credit institutions for loans, loan and similar debts", hereinafter starting from August 2017 — by the regulation of the Central Bank of the Russian Federation dated June 28, 2017, No. 590–P.

Insufficient provisions will distort credit risk indicators, which are calculated based on the amount of the actual provisions. There are no official statistical data on the insufficient provisions in the Russian banking sector. Therefore, provisions should be estimated indirectly based on indicators characterizing the factors of decline in total capital and the adequacy of bank capital.

In the analyzed period, the regulatory procedure for determining the amount of total capital, as well as indicators of the bank's capital adequacy, changed. Until 2015, the regulatory documents of the Central Bank of the Russian Federation provided for the calculation of capital by the procedure based on the updated methodology of the first Basel Accord – Basel I. By this methodology, insufficient reserves, including insufficient LLPs, reduced the amount of bank's own funds after determining the amount of the main and additional capital, i.e., they were involved in the immobilization of capital as a whole. Thus, with a significant amount of insufficient reserves, there was a threat of compliance with the requirements for the adequacy of its own funds (capital adequacy ratio CAR1.0, former CAR1). By the requirements of Basel III [23], the transition to which was fully implemented in Russia in 2015, the insufficient LLPs reduce the cost of the most qualitative element of total capital – common equity Tier 1 capital and may lead to the non-compliance with the requirements for its sufficiency (CET1 ratio).

The indicators characterizing the factors of decline and the adequacy of bank capital illustrate the absence of a significant volume of insufficient LLPs on non-performing household loans to individuals in the Russian banking sector.

There were no facts of violation of the equity capital adequacy indicator in the Russian banking sector in 2012–2019. The minimum value of the capital adequacy ratio CAR1.0 (CAR1) at the level of 11.6–11.8% was noted in the IV quarter of 2017, during 2018–2019 on most dates, the value of CAR1.0 exceeded 12%[11]. The value of the capital adequacy ratio was noted since the introduction of the facts of its violation. Values of the CET1 ratio in the period 2015–2019 were in the range from 7.8% (as of early December 2017) to 8.9%, with the minimum allowable value of 4.5%. It suggests that insufficient LLP of the banking sector is insignificant and does not have a substantial impact on the indicators of credit risk for household loans provided by the banking sector published and analyzed in this study.

On the whole, the identified trends suggest that the pressure of credit risks associated with household lending on the stability of the Russian banking sector has decreased.

CONCLUSIONS

Macroprudential regulation of bank household lending in Russia is developing, new sectoral instruments are being introduced to limit credit risks of the local banking sector

[11] Review of the Banking Sector of the Russian Federation. URL: https://cbr.ru/banking_sector/statistics/ (accessed on 15.05.2020).

and ensure the stability of the banking and financial sectors of the Russian economy.

The Russian practice of macroprudential regulation of household lending is based on international regulatory standards and guidelines. During 2013–2019 to ensure the stability of the local banking sector, the Bank of Russia introduced requirements for the mandatory calculation of the true interest cost and debt burden indicators on loans and the assessment of credit risks, depending on the actual value of these indicators. The response of the banking sector to the true interest cost indicator is more visible than to the debt burden indicator. This is due to the re-orientation of bank lending policies, which began in 2013 and generally ended by 2019, from aggressive behavior in the loan market to more cautious. The credit institutions' response to the introduction of PTI should be studied over a longer period in a post-pandemic environment.

We believe that the true interest cost and debt burden indicators should be viewed as macroprudential instruments of indefinite action and should be maintained during the pandemic. The growth of possible credit risks as a result of lower incomes of borrowers in the banking sector should be balanced by anti-crisis measures of a temporary nature, such as payment holidays.

Due to the consequences of the expected decline in production, lower incomes of households, and the outflow of deposits of individuals, structural shifts in the assets and liabilities of the banking sector are forecast both in terms of maturity and between different credit institutions. In this regard, one more direction should be considered to eliminate threats to the stability of banking activities, including the increased risks of household lending. We believe that the regulator should create conditions that ensure the ability of creditors to restructure bona fide debts during the pandemic without risking bank liquidity. Such regulatory conditions can be shaped by expanding operations to provide the banking sector with additional liquidity, including monthly and annual repo auctions. The effectiveness of measures to ensure liquidity of the banking sector in the context of a decrease in household incomes may be the subject of further research.

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Sustainability Assessment of Savings System in Russia

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ABSTRACT

Resource and financial support for economic growth is the most important economic task that requires an instant solution. A study of nature, institutional structure, efficiency and sustainability of the savings system in Russia may contribute to this solution and is defined as the **subject** of this research. The **aim** of the article is to test the methodology for the sustainability assessment of the savings system in Russia. The methods of system analysis and mathematical statistics represent the **methodological basis** of the research. The fundamental nature and consistent development of savings relations and processes for the economy provided **the starting point** of the study The authors consider national savings as an investment resource, which is formed through the institutional structure of the national savings system and the instrumental environment, and their sufficiency ensures stable economic growth of the country. **The central point of the research** within the framework of the article is the analysis of the intermediary function of the savings system, which optimizes the main parameters of the savings market — the demand for savings resources and their supply, and well as their financial stability assessment The **main result** of the study provides further development of the previous approach to understanding the essence of the system of national savings (NSS) and its sustainability assessment, in terms of the economic security of the country as well. In addition, the authors attempted to assess the stability limits of the national savings system using mathematical statistics tools. The subject area of the article and the results of the study provide new knowledge about the nature, conditions and sustainability assessments of national savings systems and significantly contribute to the scientific discussion of the current and future trends of the world economy development and economic growth supported by finances and resources.

Keywords: national savings system; stability limits of the savings system; sustainability assessment of the savings system; economic growth

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INTRODUCTION

The 2008 crisis revealed the inability of the modern economy to properly fulfill its predictive function. Not a single direction of economic research, not a single school of economics predicted the causes and forms of its occurrence, the consequences and their destructive force. This induced researchers from different countries to revise economic studies, postulates, well-established and generally accepted theories. The second decade of the XXI century was marked by the emergence of a whole series of fundamentally new, unconventional studies. The most revolutionary changes took place in the financial sector of the economy.

The new study largely redefined the role and importance of the financial sector, financial markets, and institutions in the economic system at all levels, as well as at the global level. If earlier the influence of the financial sector on economic growth was assessed not only as positive but as constantly positive, the dominance of the financial sector seemed to be the norm, in the post-crisis period the postulates gave way to situational cautious answers to rather specific questions.

At the beginning of that period, studies that differentiated financial systems based on quantitative methods of assessment were of particular interest. The financial structure ratio (FSR) and the financial structure gap (FSG) were proposed at that time and adopted by international monetary and financial institutions. In our opinion, this may lead to a change in the typology of financial systems and international financial architecture.

The attempts to prove the ambiguous influence of the development of the financial sector of the country's economy on its macroeconomic indicators were considered as a logical continuation of the research. Financial development was no longer identified solely with the financial depth of the market; it is subjected to multivariate analysis. Financial development and financial system were assessed by a matrix of indicators (4×2: depth, availability, efficiency, stability of financial institutions, and financial markets). Based on this approach, the World Bank created the Global Financial Development Database (GFDD), which included 111 indicators for the countries of the world. The International Monetary Fund started to use a truncated matrix (3×2, excluding financial stability indicators) to calculate the Financial Development Index (FDI), which, being integral, was derived from 20 indicators.

Studies of the financial possibilities boundaries (limits) and the inconsistency of various parameters of financial development, for example, financial depth and stability, were rapidly developing; sustainable development and inclusion [1, 2]; technological revolution and measurement of financial inclusion [3].

Systemic risk management had a special place in modern research, establishing the relationship between regulation and financial stability [4], assessing the efficiency of the financial sector and its segments [5], financial involvement of participants in economic life and stability [6, 7]. Theories of sustainable finance and adaptive markets were developing simultaneously [8].

All this was evidence of significant positive developments in financial research over the past decade. At the same time, some problems remain undeveloped, despite the exceptional scientific prospects and applied value.

Such topics, in our opinion, include the study of savings systems on a global scale and at the level of national economies, issues of their typology, analysis of the institutional structure, safety, efficiency, assessment of the current state, sustainability, risk profile, modeling of variable development. Russian economists attempted to address these issues in their works [9].

NATIONAL SAVINGS SYSTEM: ESSENCE, INSTITUTIONAL STRUCTURE, SUSTAINABILITY, SECURITY

In the context of globalization, accompanied by integration processes in all spheres of public life, the problem of sustainable development of national savings systems that form the resource and financial potential of the economic development of a particular country acquires particular relevance. For the Russian Federation, maintaining the sustainability of the national savings system in modern conditions is especially important in the light of economic sanctions and the priority of the formation of investment resources from internal sources. Before examining the problem of assessing the sustainability of the Russian savings system, let us define the concept.

Attempts to reveal the essence of the savings system have been undertaken for a long time, while the approaches to understanding the essence of the definition are different. Some authors proceed from the fact that in a narrow sense the savings system is an element of the resource management system of a separate commercial bank and, in a broad sense, a subsystem of the country's banking system [10, p. 60]. In our opinion, this point of view simplifies the concept of a savings system, since it does not consider other most important subsystems and elements due to the variety of forms of savings and the functioning of institutions that mediate their circulation. In the literature there is also a broader definition of the savings system, which interprets it as a combination of several basic elements: savings in the form of deposits in bank accounts, savings in insurance policies, and savings in securities [11, p. 8]. This approach is also incomplete since it does not take into account all the variety of subjects and objects of the system.

The position of the authors who approach the understanding of the savings system through the unity of all subjects of savings in the national economy seems convincing, noting that the savings system allows accumulating not only the savings of individuals in commercial banks but also the savings of "charitable and economic organizations and government bodies of different levels" [12, p. 17]. Inclusion in the savings system of a wider range of subjects than households allows expanding the list of its subsystems and elements by adding other forms of savings. One can partially agree with the interpretation of the savings system as an independent object and subsystem functioning in a market economy, as a "complex, constantly developing material socio-economic system, the basis of which is the process of organizing 'savings' relations (savings process) of subjects and objects of savings ... concerning the subject ... savings regulated by the state" [13].

In the above approach, savings are considered as the subject of the savings system, and the object is the set of savings institutions. Sharing the authors' position on the need for a separate comprehensive study of the savings system, we consider savings in all the variety of their forms as its object, and refer savings and investment institutions to savings subjects, along with individuals, enterprises of the real sector and the state.

In our opinion, the object of the savings system is distinguished by various forms of savings. This means that the essence of the savings system should be determined, considering all forms of savings: natural-material, financial, intangible non-financial (know-how, patents, licenses, etc.), as well as a set of institutions that mediate their circulation and transformation into investments. Based on this, the national savings system will be considered as a multi-level complex of institutions and relations arising between economic entities in the course of the savings process associated with the formation, exchange, and use of savings resources within national borders [9, p. 65].

One of the most important criteria for structuring economic systems is functionality. This is due to the specifics of the activities of various groups of institutions (organizations, structures) included in the system, each of which performs a special priority function (a number of functions). If the savings system is structured in accordance with the functional criterion, it should include (mostly) the banking system, insurance, pensions, the system of stock institutions, foreign exchange markets, as well as markets for real and innovative (intellectual) investments, part of the system of information and analytical and educational institutions, as well as credit unions, investment companies, and funds, purely savings institutions (savings banks, savings, and loans, postal savings institutions, etc.).

An increase in the resource and financial potential of the national economy directly depends on the ability of the institutional structure of the national savings system to accumulate savings, mediate their circulation and increase the efficiency of use. In this regard, the timely solution to the problem of sustainable development of the national savings system is of particular relevance.

The sustainability of the national savings system in a broad sense will ensure a reduction in the number of bankruptcies of its institutions (commercial banks, credit cooperatives, mutual funds, insurance organizations, non-state pension funds, etc.), prevention of non-return of savings, serious violations of the intermediary functions of the system, prevention of breaking ties between subjects of savings relations. Within this approach, the sustainability of the savings system can be viewed in terms of the continuum in which the national savings system can function within a stable corridor bordering on instability.

Sustainability analysis of a savings system is intended to help identify threats to its operation and development, identify directions for ensuring stability, and design appropriate policy responses. The focus should be on systemic pressures and linkages to assess the sustainability and vulnerability of a system, as well as the economic, regulatory, and institutional determinants of sustainability and stability. In addition, it is necessary to analyze whether the system exhibits vulnerability that could trigger a crisis, exacerbate macroeconomic shocks, or impede policy responses to these shocks. Depending on the results of the analysis, a method is chosen to solve the problems of ensuring the sustainability of the savings system: constant prevention (when the national savings system is in a stable corridor), corrective actions (when the national savings system is approaching instability) and decisive measures (when the national savings system is experiencing instability).

In the works of Russian and foreign scientists, ensuring the sustainability and stability of economic systems within national borders is considered as a necessary condition for economic security [14–18]. This follows from the numerous definitions of the authors, who combine two key concepts — "sustainability" and "safety". As noted in the scientific literature [14, 15], the category "security" is complex and covers the most important segments of the internal life of the state and society, manifesting itself in interdependent and closely interrelated components — economic, military, political, environmental, transport security, etc.

Some authors associate national security with government measures aimed at ensuring sustainable economic development and social stability [16, p. 3]; the stability of the monetary and financial system is considered a condition for the economic security of the country, which, due to the excess profit of speculative operations, may face multiple headwinds [17, p. 11]; consider this as a degree of protection against the negative impact of internal and external threats

that can be neutralized by creating a new institutional environment to increase the competitiveness of the national economy through innovation, technological breakthrough, and the development of nanotechnology [18, p. 301].

Discussing the development of the financial sector on a global scale for the next decade, foreign experts identify the stability and sustainability of financial systems as a priority problem that poses a threat to national economic security [19]. The following arguments are given: severe financial crises contribute to a long-term recession, which significantly hinders economic growth (on average, a financial crisis leads to a 10% reduction in production); a poorly managed financial sector may lead to inequality, which is now becoming a threat to the stability of national economies. Thus, it is concluded that the stability and sustainability of the functioning of economic systems are priority issues that need to be addressed in the next decade.

The IMF's Global Financial Stability Report focuses on emerging market finance and highlights the risk of sustained market access for emerging market borrowers amid threats to global financial stability.* In the foreign literature, there is a concept of "sustainable financing", which, unlike traditional financing, should take into account the financial, social, and environmental benefits [20].

Russian economists characterize the current state of the Russian economy as unstable and associate this with a large number of threats entailing risks that undermine the possibility of implementing priority tasks of socio-economic development, creating economic problems of national security [21, p. 8]. It is proposed to solve this problem together with the implementation of national and state interests, which implies the development of a mechanism for socio-economic reforms in close connection with the tools to neutralize threats to the instability of the global financial system [22, p. 210]. In the Russian scientific literature, there is an explanation of economic security from the point of view of the highest level of abstraction. Proceeding from the fact that absolute safety presupposes the absence of danger, the presence of a contradiction in the "danger –safety" system leads to its qualitative development since the reaction of any stable system to danger must be its improvement. Thus, the concept of security is interpreted not as a state of security, but as keeping the main threats at a socially acceptable level (within certain limits) [23, p. 32].

In our opinion, the economic security of a country depends on its resource and production potential, investment support, the quality of institutions and the ability to update the institutional structure. When assessing the category "economic security", one way or another, this category interacts with the concepts of "threat" and "threat to security". Both concepts are currently not legally established but are widely used in the scientific literature. At the same time, using the "security" category, it is necessary to clearly understand what exactly is a threat to "economic security", what the threat comes from, to whom (what) it is directed, what is provided (guaranteed), how is measured and standardized.

Since the resource potential of the national economy is formed within the framework of the national savings system, ensuring its sustainable functioning is the most important goal of establishing a strategy for the long-term economic security of the state. Threats to the national savings system that affect its security are everything that will hinder the development of relations between the participants of the savings system.

* Global Financial Stability Report (2019). International Monetary Fund. October 16, 2019. URL: https://www.imf.org/en/publications/gfsr (accessed on 05.05.2020).

In our opinion, *internal* threats in the current conditions can be:

- instability of the socio-economic situation in the country;
- high risks of non-return of savings;
- loss of jobs and other sources of income, due to the global lockdown caused by the COVID-19 outbreak;
- decrease in the profitability of investments in various types of assets;
- high inflationary and devaluation expectations;
- unpredictable prospects for maintaining an acceptable level of financial support, etc.

External threats include:

- costly confrontation (including the new arms race);
- high dependence of the economy on external economic conditions;
- ideological and value expansion and destructive informational and psychological impact on the citizens of the country from outside;
- uncertainty and fragile stability of the system of international relations;
- outside interference into internal affairs of the state.

The internal and external threats to the country's security are determined by a combination of objective and subjective factors. The first is associated with the miscalculations of the domestic policy pursued in the Russian Federation, and the second is associated with the escalation of international tension.

To minimize threats and ensure the positive dynamics of the national savings system, it is necessary to maintain its stability within certain limits. According to Pareto optimality, the maximum stability of the dynamic equilibrium of the system is the state of its equilibrium with the highest possible efficiency. Pareto optimality is achieved with the maximum possible efficiency of resource allocation and characterizes the maximum stability of the dynamic equilibrium of the economic system. The state of the minimum possible efficiency determines the limit of the minimum stability of the equilibrium of the system.

In the process of development, the efficiency of the economic system accumulates. After reaching the maximum for a certain stage of development (Pareto optimality), a redistribution of efficiency occurs when the new state is disorganized. The process of accumulating the effectiveness of the economic system has its limits — it ends in a crisis. This is followed by the transformation and transition of the system to a new stage of development. The state of the dynamic equilibrium of the system between the limiting maximum and minimum parameters is stable.

FINDING THE STABILITY LIMITS OF THE RUSSIAN SAVINGS SYSTEM

A method of mathematical statistics was applied to find the stability limits of the national savings system and the factors affecting it. The indicators of the efficiency of the Russian savings system over the past 18 years were considered. During this period, both positive and negative results were achieved (the growth rates of indicators decreased). We are interested in the positive results of its functioning in terms of the impact on the system development process. They will be considered as parameters to ensure stability. Negative values bring the system out of a stable state. This is important for the development of the system, since any complex system develops dynamically, passing from one stable state to another as a result of instability.

We determine the indicators of the stability of the Russian savings system for the selected stage of development. To do this, we analyze the dynamics of gross and net savings in the Russian economy over the period 2001–2018 using statistical indicators of relative and cumulative frequency. The parameters under study in terms of mathematical statistics represent a sample,

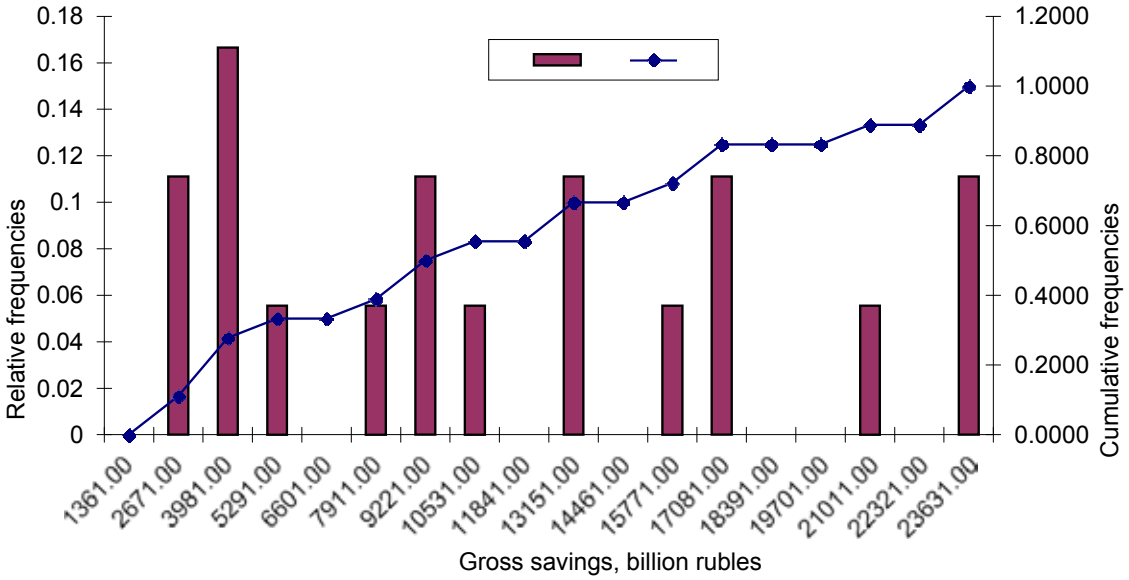

Fig. 1. **Relative and cumulative frequencies of gross savings in the Russian Federation for the period 2001–2018**

Source: Federal State Statistics Service. National accounts. Consolidated account. Account for using disposable income www.gks.ru

in this case, 18 units for each value, i.e. the general population consists of 18 units (indicators characterizing the activity of the savings system) with homogeneous samples: one of them is a sample of positive values of indicators, the other is of negative ones. Since the stability of the system is ensured by positive parameters, we select a homogeneous sample with positive values and carry out subsequent analysis using the tools of mathematical statistics.

The total number, which indicates how many times a unit was found in the data, will be considered as the frequency, and the ratio of the frequency of units to the sample size as the relative frequency. The relative frequencies show how often certain values of the analyzed parameters have occurred over the past 18 years [24].

To check the correspondence of the observed data to objective reality, there is a statistical hypothesis — an assumption about the form or individual parameters of the probability distribution, which is subject to verification using the available data. We consider the null hypothesis, according to which all events happened naturally (by chance). Typically, the null hypothesis is formulated in such a way that, based on observations, it can be rejected with a predetermined probability of error (significance level). In statistics, the most common level of significance is $\alpha = 0.05$. A value equal to $1 - \alpha$ is a confidence level (reliability level), i.e. the probability recognized as sufficient in order to confidently judge the adopted statistical decision. Accordingly, the possible choice of values of confidence probabilities is 0.95, 0.99, and 0.999.

Determining how a given unit belongs to the general population is not difficult if the distribution in the population is normal. For this, the three-sigma rule is used: 99.7% of all units are within $M \pm 3\sigma$. This rule applies in most other cases as well. When the number of sampling units is less than 30, the limits of the confidence interval are calculated by the formula

$$[M - s; M - t_{np}s],$$

where M is the mean, s is the standard deviation, $t_{np}s$ is the value of the Student's t-distribution with the number of degrees of freedom n and the confidence level p.

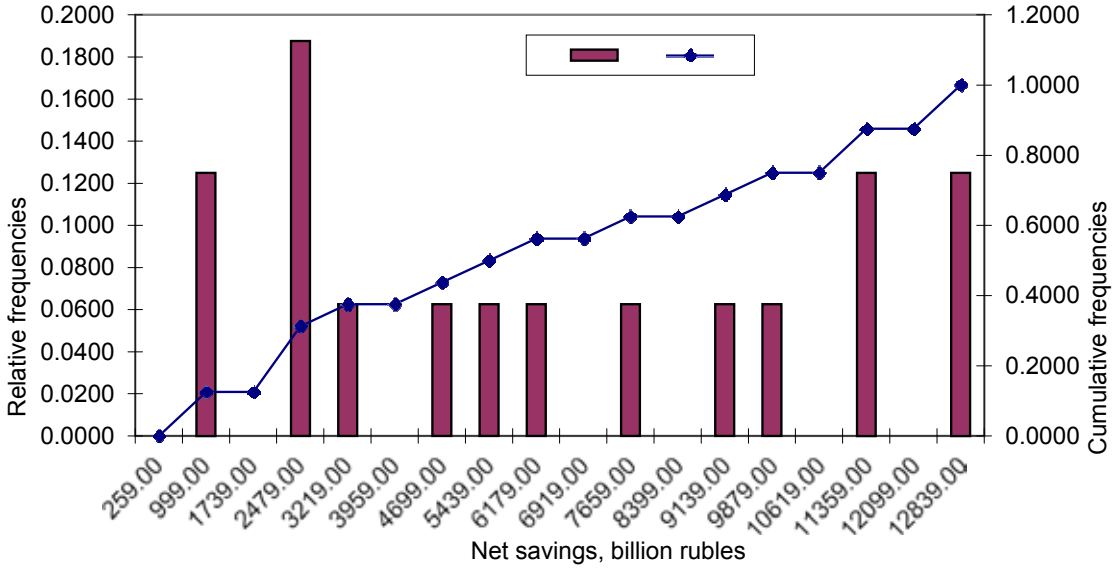

Fig. 2. **Relative and cumulative frequencies of net savings in the Russian Federation for the period 2001–2018**

Source: Federal State Statistics Service. Investment in Russia www.gks.ru

Since the number of units used in our analysis is less than 30, the confidence level is assumed to be 95% (this is half the confidence interval for the mean). Thus, a unit that falls within the obtained interval will belong to this population with a probability of 0.95. For the outlying case, we multiply the obtained confidence interval by $\sqrt{n}$. In this regard, in our opinion, there is no need for a separate probability distribution calculation.

To find the confidence interval limits, we will use the Descriptive statistics of the MS Excel. *Fig. 1* shows data on the relative and cumulative frequencies of the value of gross savings for the period 2001–2018.

The data obtained indicate that during the period under review, the most common indicators of gross savings were close to RUB 3981 billion. To refine the result, let us find the limits of the 95% confidence interval for the mean and outlying cases of the entire sample of gross savings values. The reliability of the result is equal to half the confidence interval for the population mean. Using MS Excel, we will estimate the mean of gross savings for the period 2001–2018 and find the limits of the confidence interval. The average value is RUB 10693.87 billion, i.e. with a probability of 0.95, the population mean is in the range of RUB 10693.87 ± RUB 3546.80 billion.

To find the confidence limits for the outlying case, it is necessary to multiply the above confidence intervals by $\sqrt{n}$, where n is the number of values (in this case, 18 values). The outlying case falling within the range of RUB 7147.06–14240.67 billion is considered to belong to the population with a probability of 0.95, going beyond these limits can be rejected with a significance level of 0.05. Thus, the range of changes in the value of gross savings in the period under review ranges from RUR 7147.06 to RUR 14240.67 billion. Comparing the results obtained, we conclude that the value of RUB 3981 billion is outside the 95% confidence interval for the mean, so the optimal parameter should be sought as the mean of the following gross savings: RUB 9221, 13151, 17081 and 23631 billion, which is RUB 15443.5 billion.

Considering the economic changes in the country, it is advisable to narrow the period under review to 2008–2018. In this case, the average value is RUB 15827.72 billion,

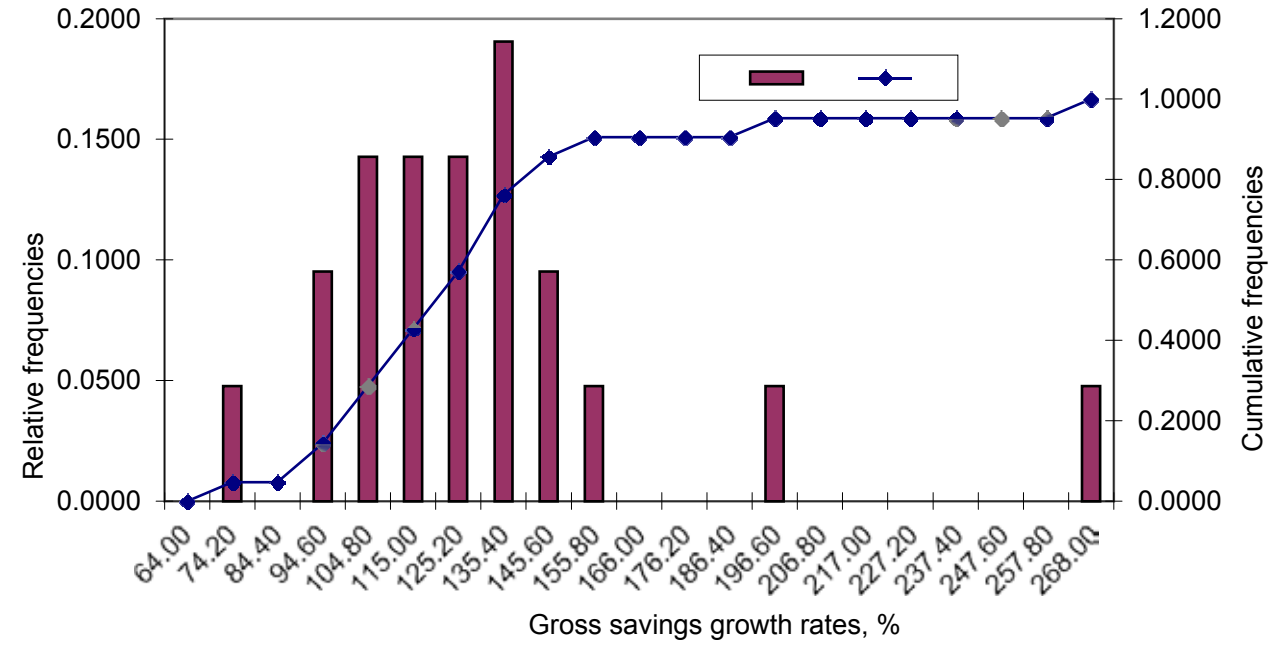

Fig. 3. **Relative and cumulative frequencies of gross savings growth rates in the Russian Federation for the period 1999–2018**

Source: Federal State Statistics Service. National accounts. Consolidated account. Account for using disposable income www.gks.ru

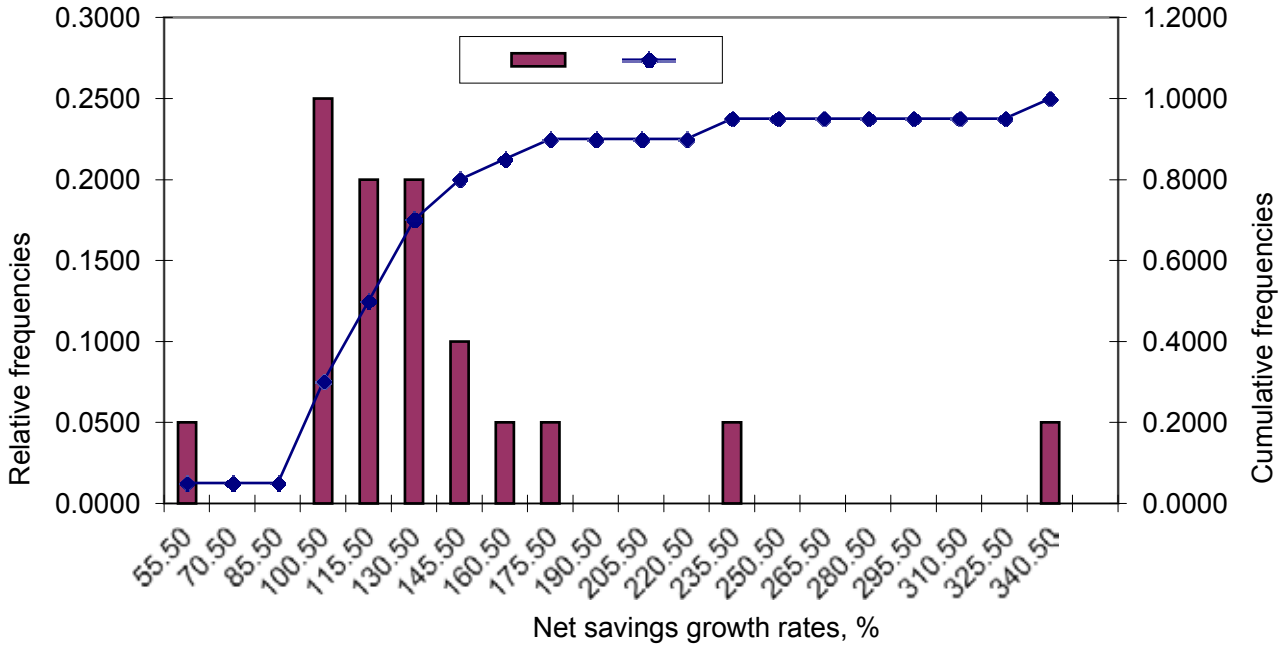

Fig. 4. **Relative and cumulative frequencies of net savings growth rates in the Russian Federation for the period 1999–2018**

Source: Federal State Statistics Service. National accounts. Consolidated account www.gks.ru; Federal state statistics service. Investment in Russia www.gks.ru.

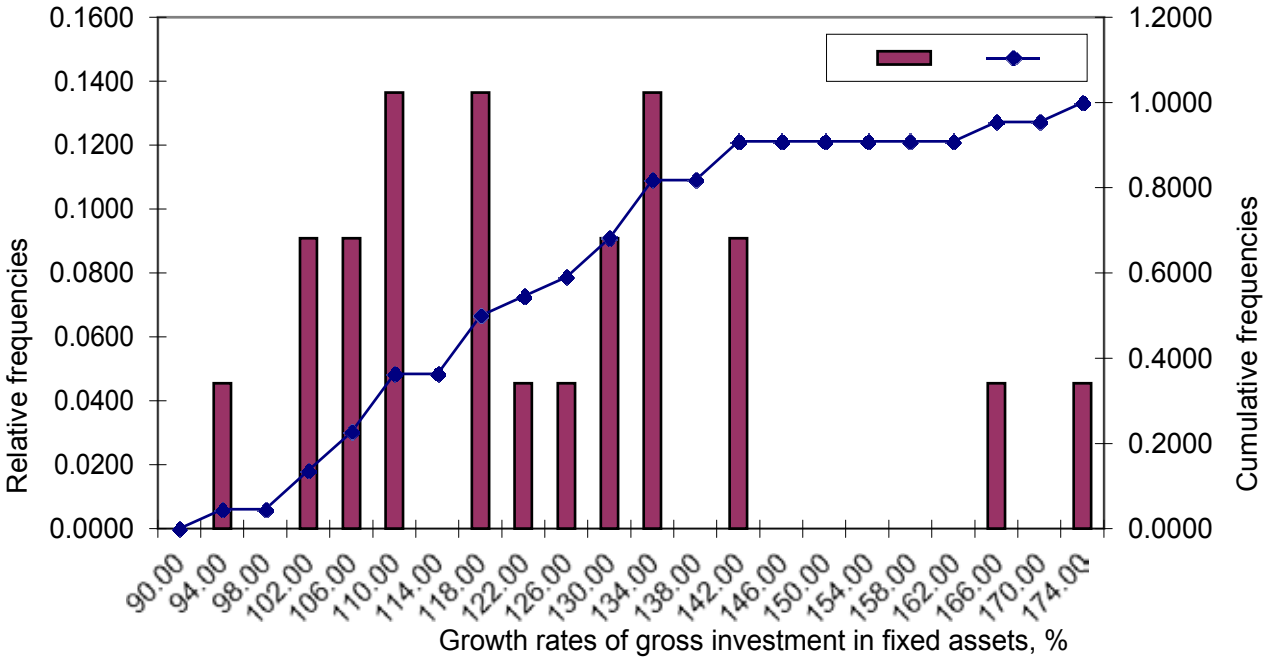

Fig. 5. **Relative and cumulative frequencies of growth rates of gross fixed investment in the Russian Federation and for the period 1999–2018**

Source: Federal State Statistics Service. Investment in Russia www.gks.ru.

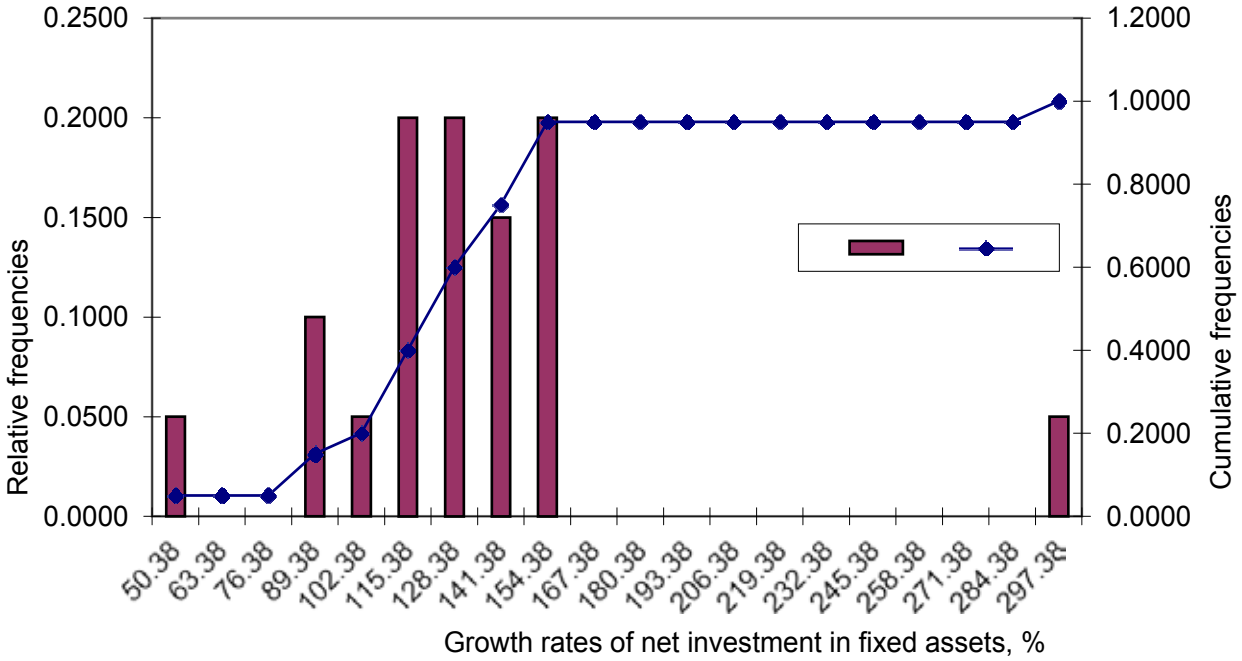

Fig. 6. **Relative and cumulative frequencies of growth rates of net fixed investment for the period 1999–2018**

Source: Federal State Statistics Service. Investment in Russia www.gks.ru.

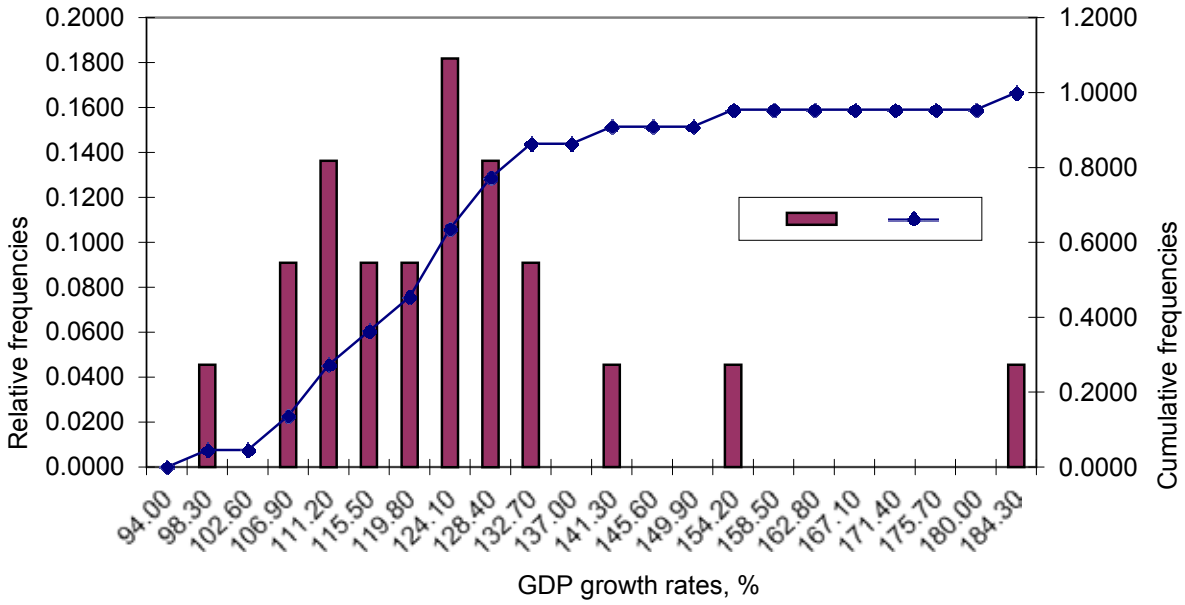

Fig. 7. **Relative and cumulative frequencies of GDP growth rates during 1999–2018**

Source: Federal State Statistics Service. National accounts. Consolidated account. Production account www.gks.ru.

i.e. with a probability of 0.95 the population mean is in the range of RUB 15827.72 ± 3642.02 billion. Consequently, the change in the value of gross savings in the range from RUB 12185.70 to 19469.74 billion is considered safe for the country's economy.

Data on relative and cumulative frequencies of net saving for the period 2001–2018 (*Fig. 2*) allow us to find the safe limits of change in the value of net savings, which are RUB 8665.79–12577.17 billion.

To forecast the resource potential trends of economic growth in the country, it is advisable to find the safe growth rate limits on gross and net savings. To do this, we use the above-mentioned approach.

Dynamics of the relative and cumulative frequency of growth rates of gross and net savings for the period 1999–2018 shows that during the period under review, the frequency of values of the growth rates of gross savings was 135.4% (*Fig. 3*).

The mean for the gross savings parameter is 126.56% with a probability of 0.95, the mean for the general population is in the range 126.56 ± 10.82%. Thus, the optimal growth rate of gross savings is at the level of 135.40% per year. For the growth rate of net savings with a probability of 0.95, the mean for the general population is in the range of 130.62 ± 16.17%. Consequently, the growth rates of net savings — 115.50 and 130.50% — may be considered optimal *(Fig. 4)*.

To create conditions for economic growth, it is important not only to maintain the growth rates of gross and net savings at a certain level but also to use them productively for investment purposes. In this regard, it is of interest to identify the relationship between savings, investment, and GDP — the final indicator of economic growth.

The data obtained on the relative and cumulative frequencies of the studied values allowed us to estimate their parameters, which are most frequent in the analyzed period: for gross investment in fixed assets, the growth rates are 110.00, 118.00 and 134.00%; for net investments in fixed assets — 115.38, 128.38 and 154.38% *(Fig. 5, 6)*.

On this basis, using Excel, we will find the mean and optimal values of the growth rates of the studied parameters, as well as the confidence interval limits for them. Thus, the mean value of the growth rate of gross investment in fixed assets for the

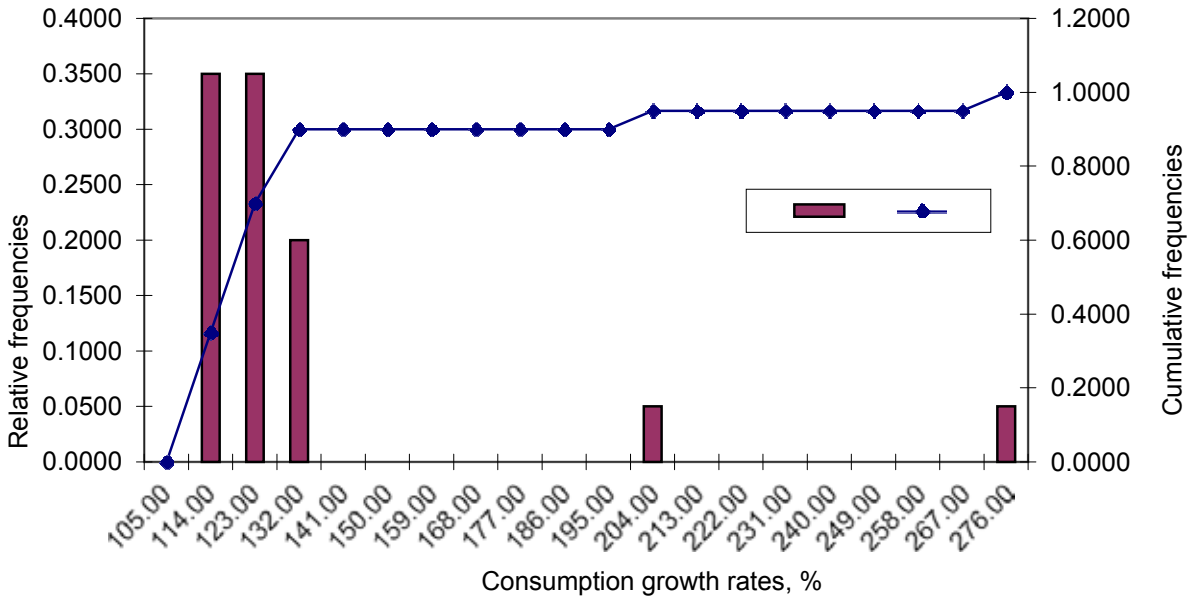

Fig. 8. **Relative and cumulative frequencies of consumption growth rates for the period 1999–2018**

Source: Federal State Statistics Service. National accounts. Consolidated account. Invoice for goods and services www.gks.ru.

Table

Parameters (nominal indicators) defining the stability limits of the savings system in Russia

Indicator	The interval for the population mean of indicators	Safe limits of values change (stability limits of NSS)
Gross savings growth rate	126.56 ± 10.82%	115.75–137.38%
Net savings growth rate	130.62 ± 16.17%	114.45–146.78%
Growth rate of gross investment in fixed assets	123.46% ± 6.33%	117.13–129.79%
Growth rate of net investment in fixed assets	125.03 ± 12.00%	113.03–137.03%
Consumption growth	127.97 ± 9.52%	118.45–137.49%
GDP growth rate	112.52 ± 12.31%	100.21–124.82%

Source: compiled by the authors.

period was 123.46%, the mean interval for the general population was 123.46 ± 6.33%, and the optimal value of the growth rate of investment in fixed assets was 118%. The parameters of the growth rate of net investment in fixed assets were: mean value — 125.03%, change interval — 125.03 ± 12.00%, optimal value — 128.38% per year.

Among the GDP growth rates — the resulting indicator of macroeconomic dynamics, the most common value for the period under review — the growth rate is at the level of 124.10% (*Fig. 7*). According to calculations, the mean value of the indicator was 112.52%, the range of change was 100.21–124.82% (112.52 ± 12.31%), and the optimal value was 124.10%.

In our opinion, the dynamics of consumption in the economy is of particular interest, since it determines the trends in aggregate demand and current savings. *Fig. 8* illustrates that for the period 1999–2018 the most frequent consumption growth rates were 114.00 and 123.00%, with a mean value of 127.97% (*Fig. 8*).

Based on the mean for the entire population, which is in the range of 127.97 ± 9.52%, the safe change limits of the consumption growth rate were 118.450–137.49%. This gives the optimal level of consumption growth rate for the period — 123.00%.

According to the results obtained in the reviewed period, the limits of change in the growth rate of gross and net savings, namely, the growth rate of gross savings 115.75–137.28%, the growth rate of net savings 114.45–146.78%, provided:

1) growth rates of gross investment in fixed assets — 117.13–129.79%;

2) growth rates of net investment in fixed assets — 113.03–137.03%;

3) consumption growth — 118.45–137.49%;

4) GDP growth rates — 100.21–124.82% (nominal indicators).

These parameters can be considered as the stability limits of the national savings system at this stage of development (see *Table*) since they are obtained based on a sample of positive values, i.e. those that ensured positive dynamics of the savings system, and, accordingly, its sustainability.

The revealed dependencies determine the percentage of GDP change as a result of an increase in gross savings: when the value of gross savings changes by 1%, GDP growth is 1.143%. Thus, having determined a certain rate of GDP growth as a priority of the economic strategy, it is possible to set targets for the parameter of national savings and justify the directions of institutional reforms to ensure the sustainability of the savings system.

CONCLUSIONS

A review of the foreign and domestic scientific literature on the functioning of national savings systems, the optimal functioning of savings institutions, the behavior of participants in the savings process, indicators and factors to ensure the sustainability of savings systems, approaches to the sustainability assessment showed that, despite the research conducted on savings at the micro-level, a wide range of issues remains unresolved. The issue of the sustainability assessment of national savings systems is among them. The attempt to find "working" applicable studies for developing a methodology for the sustainability assessment of the Russian savings system was not successful.

The features of the proposed methodology for the sustainability assessment of the Russian savings system are as follows:

1) for the first time, the analysis of the results of its functioning was carried out on the basis of the assessment of the dynamics of gross and net savings using the parameters of the relative and cumulative frequency;

2) only positive results of the functioning of the savings system (growth rate increase

of indicators) were considered as parameters that ensure its sustainability;

3) the stability limits of the Russian savings system were determined on the basis of the relationship and interdependence with the results of the functioning of the real sector of the economy — gross and net investment in fixed assets and GDP, the resulting indicator of economic growth.

The calculation of the parameters that determine the limits of the stability of the Russian savings system shows that a close relationship between the growth rates of savings, investments, and GDP in the Russian economy ensures the sustainability of the national savings system, which requires the development of an effective mechanism to transform savings into investments, improve the institutional structure of the savings system, create a system of incentives and guarantees for the subjects of savings relations.

Prospects for future research of the identified problems are seen in the identification of cyclical lags in the mutual influence of gross and net savings and investments, consumption, and GDP on the Russian economy, the development of economic policy tools considering small and medium investments and savings cycles.

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Tax Policy Directions in Russia and the Possibility of Reducing the Tax Burden on Domestic Producers Operating in the Home Market

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ABSTRACT

The **relevance** of the research topic is due to the role of tax policy and the impact of external and internal long-term factors affecting the slowdown of the Russian economy. The **aim** of the study is to justify measures to reduce the tax burden on manufacturers concentrated on the domestic market. The authors used **methods** of statistical analysis, economic statistics, including the calculations of implicit tax rates, and the tax burden sensitivity in relation to GDP dynamics. The research **results** show that an increase in the tax burden on labor and consumption, as well as the existing correlation between the tax burden on capital and labor, hinders investments in the modernization of production and innovation, and disrupts economic growth and socio-economic development in Russia. The measures introduced by the government to overcome the consequences of the pandemic do not help to reduce the tax burden in a short-term and long-term perspective. The authors **conclude** that it is necessary to reduce the tax burden on domestic producers concentrated on the domestic market by introducing a special taxpayer status.

Keywords: anti-crisis measures; business cycle; budget revenues; crisis; coronavirus disease; multiplicative effect; tax burden; tax policy; implicit tax rate; fiscal multiplier

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INTRODUCTION

The slowdown of economic growth in Russia is a structural problem. Russia's dependence on hydrocarbon production and relevant economy structure has had a significant impact on tax and budget policy. The political situation and anti-Russian sanctions have had a dramatic effect at the end of 2014. A major economic goal in such circumstances is to support those sectors that are less dependent on both the global commodities markets and political sanctions. The study provides an extensive analysis of the current tax policy based on implicit tax rate calculation; and highlights an overview of economic measures to support industry sectors impacted by the coronavirus. The authors presented a model for the domestic economy stimulation.

LITERATURE REVIEW

Research in fiscal policy is popular and diverse. Although the main ideas were formulated by J. M. Keynes and his followers, and then rethought by supporters of the rational expectations theory, fiscal policymakers still need guidance. The authors reviewed multiple sources and presented findings of the conducted empirical study on the impact of fiscal policy factors (fiscal multipliers).

It is assumed that the effects of changes in government spending are symmetric, i.e. economic output is affected to the same degree with increasing or decreasing costs. Empirical studies often implicitly suggest a similar result; thus, the estimates of the multipliers are interpreted in the same way. Although, in the last decade, the actions of fiscal multipliers are considered at various stages of the business cycle. The effects of multipliers at different phases of business activity fluctuations are asymmetric.

Research by the Federal Reserve Bank of Richmond shows that the fiscal multiplier varies depending on the direction of fiscal action, as well as on the stage of the economic cycle. The study revealed that in the context of a constraining monetary policy the size of the fiscal multiplier of government spending is greater during the recession and smaller during the non-recession period of the business cycle. In the context of incentive policy, the multiplier of government spending has a smaller effect and its size almost does not change regardless of the state the business cycle. Therefore, fiscal multipliers are asymmetric and as assumed vary depending on two factors: financial frictions and downward nominal rigidities [1].

Kudrin A. and Knobel A. concluded that the effect of an additional unit of spending depends on their type: non-productive spending ("power" item) and unlike productive spending (investments in physical and human capital) mostly act as the ultimate consumption of resources. Therefore, their multiplicative effect of non-productive spending is weaker on the GDP and its growth. This gives rise to the dependence between economic growth and the government budget structure. The estimated effect of general government budget spending on GDP indicates that productive spending has a more significant impact on economic growth than non-productive [2].

Economic research has confirmed [3] that during the recession period, when monetary policy is ineffective, the size of the multiplier of government spending is growing; during the non-recession period — the multiplier is shrinking. Some researchers indicate that in addition to the business cycle state, the size of the budget expenditures multiplier is affected by the structure of the economy: in small open economies it is lower than in similar, but closed [4, 5].

A certain area of research is devoted to the assessment of fiscal multipliers effect, considering the current state of the financial or monetary policy.

In the study devoted to the analysis of fiscal consolidation in EU countries [6], the value of the fiscal multiplier is estimated both in linear and in modes depending on the stage of the business cycle. The authors factored in four different circumstances: the stage of the busi-

ness cycle, the open trade state, the content of amendments within the framework of fiscal consolidation, and the credit market issues caused by the weakening of the transmission mechanism of monetary policy. It has been concluded that the multiplier varies significantly depending on various conditions: the distribution of multipliers is asymmetric, and in several cases of fiscal consolidation, the value of the multipliers exceeded unity. The reason for this is that the content of financial adjustments is critical to the size of output losses associated with consolidation. If financial adjustments involve reducing transfers and subsidies or raising taxes, then the multiplier value is close to one or lower, even if the economy is in a recession.

Another result received by the authors concerns the effect of trust. If a country that has encountered problems in the credit market due to the weakening of the transmission mechanism has begun the process of fiscal consolidation in advance, then the losses from fiscal compression will be less. In the event that government-consolidated financial consolidation inspires confidence among agents, the risk premium on government bonds is reduced. This affects the reduction in interest rates for the non-financial sector. Under these conditions, financial consolidation measures may lead to some incentive effects.

Accordingly, in closed economies that are in a state of recession, losses from financial consolidation in terms of reducing output are twice the average.

The content of financial adjustments is important. Cost-based consolidation to stabilize debt and achieve a long-term reduction in the primary deficit is more effective than income-based adjustment. Reducing transfers and subsidies is useful for reducing the short-term costs of financial adjustments. If financial authorities are forced to carry out financial consolidation during a recession, they should focus on reducing these categories of expenditures, and then reduce expenditures at the cost of public sector wages, consumption, and investment expenditures during periods of increased business activity.

Current economic policy should consider not only the stage of the business cycle but also the dynamics of the credit market. According to Keynesian ideas, government spending during a recession replaces consumer spending, stimulating effective demand. This policy is effective during credit crises when lending is reduced. During a credit boom, financial consolidation should restrict excessive private investment.

The neoclassical economics followers indicate the effect of crowding out of private investment, which is due to an increase in budget spending and thus increased interest rates. In addition, funding government spending through borrowing can have a negative impact on the ability to cope with deep and long-term financial downturns [7].

The authors of the empirical study of fiscal policy in OECD countries partially addressed the discussion about Keynesian and neoclassical approaches. Scientists announced the following conclusions:

Firstly, an increase in the tax burden leads to a decrease in business activity, according to the Keynesian theory. A higher tax rate reduces real GDP and real economic growth. It goes well with the findings of the standard neoclassical growth model.

Secondly, it was indicated that consumer spending and investment respond to the tax burden to a different extend. While both components decrease after increasing the implicit tax rate, the reaction of consumer spending is weak (and statistically insignificant), while the reaction of investments is strong (and statistically significant).

Thirdly, a higher level of the tax burden does not have a significant effect on interest rates in the long run but leads to a decrease in the interest rate by several years in the near future.

Finally, the study showed that the increasing tax burden immediately leads to a constant price increase, as well as temporary inflation.

The forecast, based on the study, demonstrated that initiatives to reduce the tax burden in the USA in 2017 and China in 2019 will have a positive economic effect. Tax cuts will lead to a constant increase in investment, but this has only a temporary positive effect on the economic growth [8].

A review of empirical studies evaluating fiscal multipliers confirms well-known conclusions from Keynesian and some neoclassical models [9, 10]. In addition, the literature under review allows us to quantify the multiplicative effect and its duration [11, 12]. This article provides conclusions and suggestions based on an analysis of the nature of tax policy and supported by estimates of similar studies of the impact of the multiplier in Russia.

TAX POLICY IN RUSSIA SINCE THE 2010S

The level of the tax burden in Russia is comparable with similar indicators in OECD countries (in particular, in Germany, the Netherlands, and the Czech Republic)[1]. *Fig. 1* illustrates the calculations of the tax burden indicators to GDP in 2006–2018. The tax revenues of the consolidated budget of the Russian Federation to GDP ranged from 19 to 26%. According to the OECD methodology, which is also used by the Russian Ministry of Finance, the tax burden includes mandatory social insurance contributions and customs duties that are not referred to tax revenues according to the current budget classification.

A ratio of tax revenues with mandatory social insurance contributions and income from foreign activity (the bulk of it is customs duties) of the consolidated budget of the Russian Federation and the budgets of state extra-budgetary funds as a percentage of GDP is represented by in *Fig. 2* by the indicator "overall tax burden". In 2006–2007 it amounted to almost 40%, in 2010–2016 decreased to 30%, and by 2018 increased to 38%.

The ratio of tax revenues as a percentage of GDP and the overall tax burden changed in one direction — increasing during periods of GDP growth and decreasing during periods of recession and slowdown in economic growth (see *Fig. 1*). Since 2014, there has been a reduction in the gap between the ratio of tax revenues as a percentage of GDP and the overall tax burden. At the same time, the burden indicators in 2018 reached the values of 2006–2007, when the GDP growth rate exceeded 8% per year. In 2016–2018 with a GDP growth rate of about 1–2% per year, the overall tax burden exceeded 30%, reaching 38% in 2018.

It should be noted that in 2010–2014 while the GDP growth rate was lowering, the tax burden remained stable at 35% for the overall burden and 20% for the ratio of tax revenue as a percentage of GDP.

These facts may indicate that the rigidity of taxation is increasing. According to the former head of the Federal Tax Service M. Mishustin, the increase in the tax burden is due to improving the quality of tax administration[2]. However, as noted in the "Main directions of the budget, tax and customs tariff policy for 2020 and for the planning period 2021–2022", the increase of the burden in 2018 was due to the increase of the ruble exchange rate and the coefficient of world price dynamics used in the calculation of severance tax. Thus, it is incorrect to reduce the growth of the burden exclusively to administrative measures. The calculation of the ratio of the rate of growth of the tax burden to the rate of economic growth fully justifies this. This indicator can be called the sensitivity of the tax burden to the dynamics of economic growth.

Figure 2 shows that until 2014, for each percentage point of GDP growth, there was less than one percentage point of an increase in the tax burden (relative to GDP). The decline

[1] OECD Stat: website. Organisation for Economic Co-Operation and Development. Paris, 2019. URL: https://stats.oecd.org (accessed on 05.03.2020).

[2] Krivoshapko Yu. Assembly point. Mikhail Mishustin on tax revenues growth. Rossiyskaya Gazeta. Capital issue. 2019;290(8048). URL: https://rg.ru/2019/12/23/mihail-mishustin-rasskazal-za-schet-chego-rastut-nalogovye-postupleniia.html (accessed on 05.06.2020)

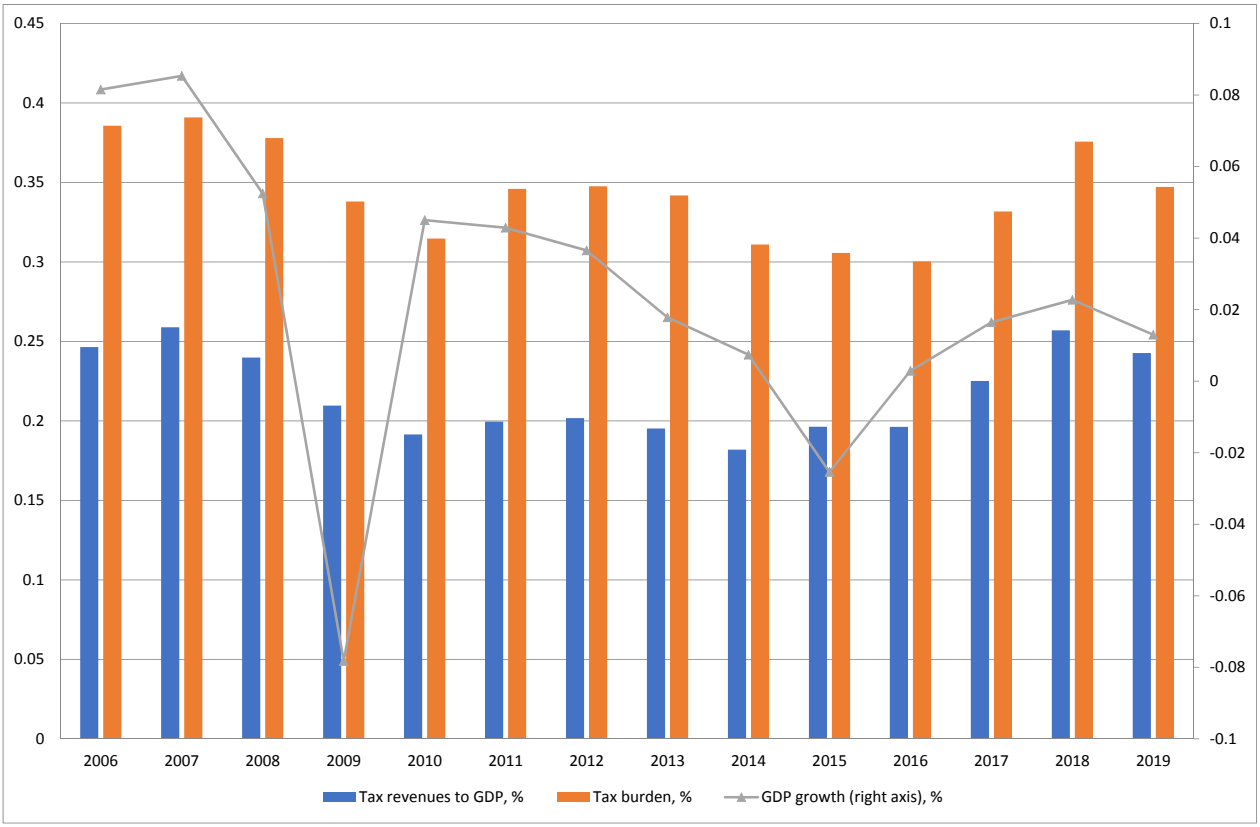

Fig. 1. **Tax burden and GDP growth in Russia 2006–2019, %**

Source: Federal government statistics service: site. URL: http://www.gks.ru (accessed on 05.03.2020).

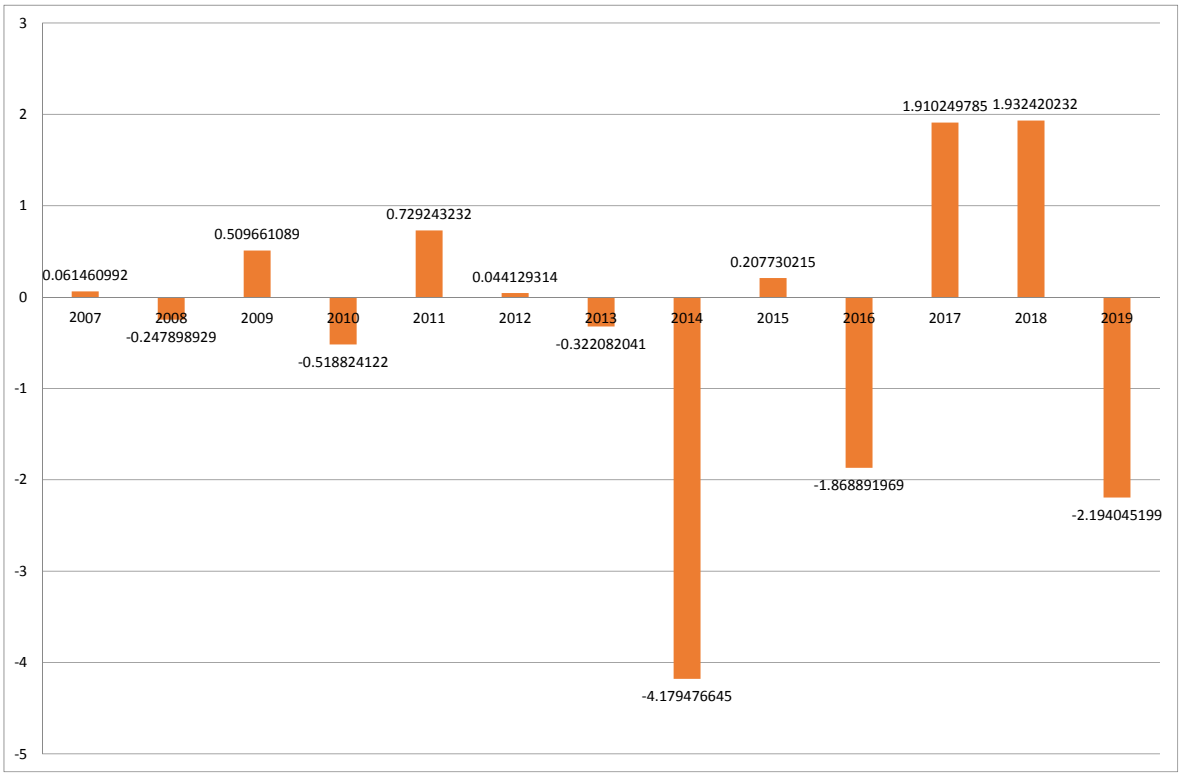

Fig. 2. **Tax burden sensitivity to the dynamics of economic growth**

Source: Federal government statistics service. URL: http://www.gks.ru (accessed on 05.03.2020).

in business activity in 2014 led to a decrease in the tax burden by more than four percentage points for each percentage point of a fall in economic growth. In 2015–2018 the tax burden sensitivity also exceeded one percentage point for each point of GDP growth. And in 2019 there was a decrease in the tax burden by more than two points.

Thus, since 2014, the dynamics of mandatory payments included in the calculation of the tax burden as a percentage of GDP have become more sensitive to fluctuations in output.

The tax burden indicator shows a general state of tax policy and economy but does not allow us to identify the influence of taxes on the behavior of economic agents. A more detailed approach to the study of the tax burden involves the calculation of effective tax rates. Average effective tax rates provide an estimate of the tax burden of an individual factor of production, an object of taxation and a taxpayer. Eurostat specialists use a methodology for calculating effective marginal tax rates (implicit tax rates, ITR) for this analysis[3]. Implicit tax rates show the burden on a particular tax base or activity. In this study, we use the methodology for calculating the implicit tax rates on consumption, labor, and capital. Also, taxes in this paper are defined as a wider range of mandatory payments than it is provided for by the budget classification in Russia. Thus, the implicit tax rates make it possible to estimate the burden on all mandatory payments that refer to the fiscal burden of economic agents. Indicators of the system of national accounts are used as a base, which is an economic source of payment of relevant payments. The methodology for calculating the implicit tax rates corresponds with the methodology for calculating the overall tax burden.

Table 1 outlines details of the indicators used to calculate the implicit tax rates on consumption, labor and capital for 2006–2018.

Estimates of the implicit tax rate calculation are given in *Fig. 3* and *Table 2*.

Figure 3 shows the evaluation of the dynamics and the ratio of the implicit tax rates. The tax burden on capital in 2006–2013 was significantly higher than the tax burden on labor and consumption. Only in 2014 and 2015, the implicit tax rate on capital fell below the rate on labor. We note that several amendments and permissions have been made to calculate the implicit tax rate

Firstly, a large number of sectoral indicators of national accounts have been used to calculate the base of the tax burden on capital according to the Eurostat methodology. Not all of them are published by the Federal State Statistics Service. In particular, data on dividend payments and mixed-income are not published. In this respect, aggregated data were used to calculate the implicit tax rate on capital; therefore, the rate may be underestimated.

Secondly, in the numerator of fiscal payments, the amount of mineral extraction tax (MET) is not considered.

As noted by L.N. Lykova [14], as well as according to the government finance statistics guide [15, p. 100] such taxes are considered as one of the types of rental income[4], if mineral exploration and mining are carried out on state-owned lands. Otherwise, MET should also be included in the total amount of tax revenue which imposes a burden on capital and income.

In this case, the tax burden analysis in Russia can be carried out in two sectors –the oil and gas and other sectors except for the oil and gas. In this paper, the agent-weighted capital burden is of interest, and therefore the MET was not included in the calculation

[3] Taxation Trends in the European Union. Data for the EU member states, Iceland and Norway. 2019 edition. Eurostat. Luxembourg: Publications Office of the European Union, 2019. URL: https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_report_2019.pdf (accessed on 03.02.2019).

[4] Here, the term "rental income" does not refer to the agents' income from mineral exploration and mining, but to budget revenues. Since the state, being the landowner, provides lands for use by agents and receives income from it.

Table 1

Implicit tax rate calculation indicators in Russia

Taxes, fees and other compulsory payments	Tax base
1. Consumption taxes	**1. Consumption**
VAT Customs duties, import Excise taxes Non-tax payments for emissions and pollution charges: payment for negative impact on the environment; payment for air pollutant emissions by stationary and mobile objects; payment for pollutant emission to water; payment for the disposal of industrial and consumer waste; payment for other types of negative environmental impacts Water tax, dues and fees for the using of objects of animal world and aquatic biological resources	Household final consumption expenditures
2. Labour taxes	**2. Labour**
Personal income tax (except for personal income tax paid in respect of dividends and in respect of income from winnings and lotteries) Mandatory social security contributions Tax levied under the simplified tax system for individuals Single tax on imputed income in terms of tax paid by individuals Patent tax	Compensation of employees
3. Capital and capital revenue taxes	**3. Capital**
Personal income tax in respect of tax on dividends received by individuals Corporate income tax Personal income tax on winnings and lotteries State duty (without duty regarding securities transactions) State duty regarding securities transactions Customs duties — export Corporate property tax Land tax Transport tax License fees Unified Agricultural Tax	Net income (corporations) Balance of primary income (net) of corporations Net mixed-income (households) Property income (households)

Source: Taxation Trends in the European Union. Data for the EU member states, Iceland and Norway. 2019 edition. Eurostat. Luxembourg: Publications Office of the European Union, 2019. URL: https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_report_2019.pdf (accessed on 03.02.2019); [13].

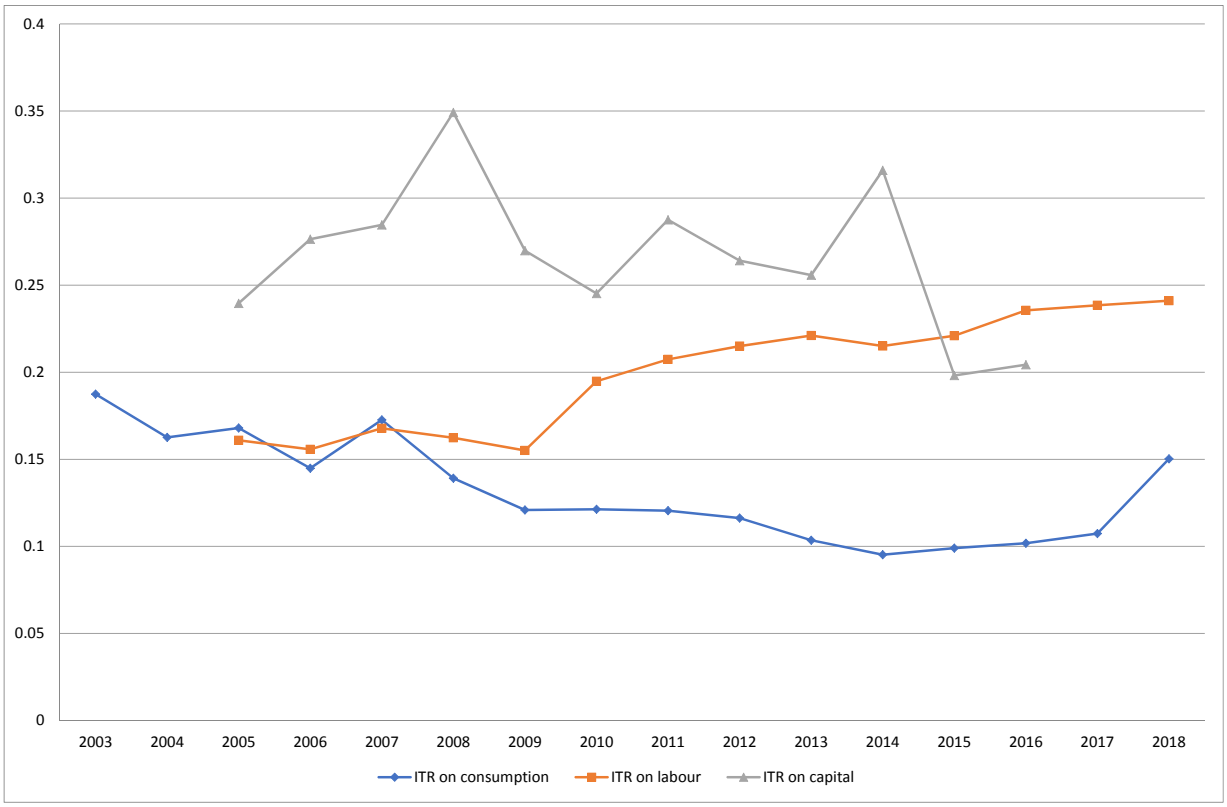

Fig. 3. **Implicit Tax Rates in 2006–2018, %**

Source: Federal government statistics service: site. URL: http://www.gks.ru (accessed on 28.02.2020); Federal Treasury of the Russian Federation: site. URL: http://www.roskazna.ru (accessed on 01.03.2020).

of the implicit tax rate on capital in order to avoid overstating this indicator in relation to sectors not related to the extraction of mineral resources. Thus, the implicit tax rate on capital for 2016, excluding MET, amounted to 20.4% (see *Table 2*), and with MET included, the implicit tax rate increases to 30.4%.

Table 2 shows the implicit tax rates data and the share of corresponding taxes in the revenues of the consolidated budget of Russia and the budgets of state extra-budgetary funds.

A higher level of the implicit tax rates corresponds to a higher share of the tax revenues. Thus, even with fluctuations in the tax base, the volume of income received plays a significant role in changing the tax burden. An increase in the tax burden is usually due to an increase in the share of tax revenues in the total budget revenues. As for consumption taxes, there is a close link between the tax burden and the share of tax revenues (the correlation coefficient is 0.7). *Figure 2* illustrates how the tax burden decreased in 2008–2015, and has increased sharply in recent years. We note that the calculations do not apply to 2019 when the VAT rate was increased by 20%. When the relevant indicators of the system of national accounts are released, it will be possible to assess the increase of the implicit tax rate on consumption.

The tax burden on labor has been growing steadily since 2010 when the unified social tax was replaced by social insurance contributions. The implicit tax rate on labor increased from 19.5% in 2010 by 24.1% in 2018. In comparison with the average level in Europe, these figures are considerably low. In 2018, the implicit tax rate on labor calculated for 28 EU countries amounted to 36.3%[5]. However, the values of

[5] Comparative information between the Member States, Norway and Iceland concerning the implicit tax rates, 2019. URL: https://ec.europa.eu/taxation_customs/sites/taxation/files/implicit-tax-rates.xlsx (accessed on 26.03.2020).

Table 2

Implicit tax rates on consumption, labor, capital and the proportion of appropriate taxes in revenues of Russia's consolidated budget, %

Year	Consumption		Labour		Capital	
	Implicit tax rate	Proportion of revenue	Implicit tax rate	Proportion of revenue	Implicit tax rate	Proportion of revenue
2006	14.5	18.0	15.6	17.8	27.6	37.6
2007	17.3	21.3	16.8	19.8	28.5	34.3
2008	13.9	17.8	16.2	20.0	34.9	37.9
2009	12.1	19.3	15.5	23.8	27.0	30.0
2010	12.1	19.7	19.5	30.4	24.5	34.6
2011	12.0	16.9	20.7	29.4	28.7	35.2
2012	11.6	16.7	21.5	30.7	26.4	33.5
2013	10.4	15.9	22.1	33.1	25.6	31.5
2014	9.5	16.2	21.5	32.7	31.6	32.7
2015	9.9	17.7	22.1	36.4	19.8	27.1
2016	10.2	18.5	23.6	38.9	20.4	24.2
2017	10.7	18.2	23.8	36.8	n/a	23.2
2018	15.0	22.1	24.1	33.7	n/a	24.9

Source: compiled by authors.

the implicit tax rate on labor in Russia are comparable to certain Eastern European countries (Bulgaria, Romania), as well as countries with a traditionally low taxation level (Cyprus, Malta). This conclusion may seem unrealistic since there is a widespread opinion among domestic researchers and taxpayers about excessive taxation of labor [16]. The implicit tax rate indicator allows evaluating *the real tax burden*, rather than draw conclusions based on nominal rates.

The calculations show that the tax burden on capital in 2006–2014 exceeded the tax burden on labor. This fact seems to be a specific feature of the tax system of Russia, established in the 2000s. The income tax is one of the main taxes that adds a tax burden on capital. In terms of the share of revenues of the consolidated budget of Russia, income tax is traditionally comparable to the income from VAT and personal income tax. This is partially due to the fact that the profit of companies engaged in the extraction of mineral resources has a significant share in tax revenues. Another factor is the relatively low taxation level of household income in comparison with developed countries and, consecutively, the relatively low share of income tax in consolidated budget revenues.

Nevertheless, the level of the tax burden on capital in Russia for the period under review is higher than the average for EU countries. If in 2006 in Russia the implicit tax rate on capital was 27.6%, then in 28 EU countries this figure was estimated at an average of 22.8%[6]. In 2015 and 2016 the implicit tax rate in Russia decreased by 20.0%, while in the EU countries the burden increased by 23.0%. It is important to note that during this period the Russian economy was in recession, therefore this comparison is not representative.

The excessive tax burden on capital (even with the exception of rental payments) compared with the same indicator for the labor, is apparently one of the factors hindering investments in modernization and innovation. In terms of tax expenditures, it would be cheaper for companies to hire more employees than to invest in new technologies that ensure labor productivity and capital increase. This conclusion may seem incorrect if we compare the nominal rates and the share of companies' costs on labor and capital. However, the decisions of agents are determined precisely by the tax burden indicator, which allow us to estimate not the nominal amount of payments, but the relative one reduced to the source of tax payment. Indeed, if the decisions of organizations were determined by nominal tax rates, they could increase their profits by investing more in capital renewal and capital-intensive technologies. Since it does not happen, the assumption about the tax burden impact on the choice between the use of labor and capital seems reasonable. Certainly, it is impossible to conclude the significance of the tax burden for organizations when choosing several factors of production without conducting additional research. We do not consider this problem in the article.

According to the analysis, the tax burden growth on consumption and labor, an increase in the sensitivity of the tax burden to GDP dynamics are the features of the tax system that will stay in the coming period.

Summing up the analysis of the tax burden in Russia for 2006–2018, the following characteristics should be noted:

1. When the GDP fell, the tax burden dropped more than it increased during the recovery period. Since 2014, the tax burden sensitivity to GDP dynamics has risen sharply.

2. The tax burden on labor in Russia has been growing since 2009, although it remains

[6] See previous note.

low in comparison with the EU countries' indicators.

3. There has been an increase in the tax burden on consumption in recent years, which contributes to the differentiation of household incomes.

4. The tax burden on capital is on average higher than labor. Moreover, the tax burden on capital is subject to significant fluctuations. This ratio may be a factor hindering investments in modernization and innovation.

TAX POLICY TRENDS IN THE COMING PERIOD

The position of the financial authorities regarding the fiscal system is indicated in the basic documents of forecasting and strategic planning. Thus, according to the "Main directions of the budget, tax and customs tariff policy for 2020 and the planning period of 2021–2022"[7] the parameters of the tax system in Russia are fixed and serve as a guarantee of "stability and predictability of tax conditions in the medium- and long-term perspective"[8]. The tax maneuver implemented in recent years, the excess profit tax introduction, VAT rate increase, a pilot project for the self-employed, improvement of tax-filing technologies, etc. also included in the "fixed" parameters of the tax system of Russia. According to the analysis, the tax burden growth on consumption and labor, an increase in the sensitivity of the tax burden to GDP dynamics are the features of the tax system that will stay in the coming period.

Nevertheless, changes were expected in certain types of taxes and in the field of tax administration in 2020–2022.

The directions of tax policy, on the one hand, should ensure the implementation of national priorities for socio-economic development, on the other hand, to maintain the stability of the budget system and tax-related conditions. It may be concluded based on the official documents of financial authorities.

Since 2015, budget forecasting has been based on socio-economic development scenarios. The same applies to the forecasts up to 2036. The main features of the economic development within the Budget forecast and socio-economic development are similar. At the same time, the Budget Forecast provided estimates of the conservative scenario, which was based on the assumption of the slow development of the global economy.

Highly optimistic estimates of economic growth are one of the indicators indirectly confirming that strategic priorities for Russia's development are determined by Decree of the President of the Russian Federation dated 05.05.2018 No. 204 "On National Goals and Strategic Tasks of the Development of the Russian Federation until 2024" (hereinafter "Decree No. 204 from 05.07.2018"). Although the relevance of these estimates is contradictory.

In the Budget forecast and the forecast of socio-economic development until 2036 for 2019–2024 GDP is expected at an average of 2.7%. The authors of the forecast refer to the plan of the Government of the Russian Federation "to accelerate the growth rate of investment in fixed assets and increase their share in gross domestic product to 25% and other measures aimed at achieving national goals and strategic development goals"[9]. However, the action plan has not yet been developed. Some elements can be found in documents such as "The main directions of the Government of the Russian Federation for the period up to 2024" (approved by the Government of the Russian Federation on September 29, 2018), Resolution of the Government of the Russian Federation of April 15, 2014 No. 316 (as amended on May 22, 2019) On approval of the state program of the Russian Federation "Economic development and innovative econ-

[7] The main directions of the budget, tax, and customs tariff policy for 2020 and the planning period 2021–2022. The Russian Ministry of Finance. 03.10.2019. ATP "Consultant Plus".

[8] See previous note.

[9] The Government of the Russian Federation: official website. URL: http://government.ru/news/35925/ (accessed on 03.10.2019).

omy", etc. It is planned to increase the growth of investment activity due to measures to stabilize tax and customs tariff legislation, reduce the administrative burden on businesses and other measures aimed at stabilizing and improving the effectiveness of control and supervision measures, as well as by increasing the availability of sources of long-term financing.

These measures are expected to be implemented during the tax burden increase in the non-oil and gas sector in recent years. Prospects for reducing the tax burden on businesses focused on the domestic market are not visible from the text of forecasts and the main directions of government activity.

On average, over the past four years (from 2014 to 2018), the share of investments (gross fixed capital formation) in GDP amounted to 21.6%. At the end of 2019, the share of gross fixed capital formation in GDP is estimated at 21.2%[10]. To achieve a share of 25% of GDP with the simultaneous growth of GDP of 2.7% in the next six years, and in the next six years — by 3.2 and 3.0%, it is necessary to increase investments in fixed assets by 2.5–3 percentage points GDP. According to a very rough estimate, investments should grow by 4.5 trillion rubles. (in prices of 2018), or by 20% (in physical volume) in relation to the current level. Indeed, the forecast of the socio-economic development of Russia until 2036 ensures an increase in investment by 2036 by 2.2 times in comparison with 2018. Can these estimates be reasonable provided a high level of the tax burden, the current crisis in the global economy, and long-term trends to reduce the hydrocarbons production and consumption?

Thus, the Budget Forecast parameters and some of the measures of the "Main directions of the budget, tax and customs tariff policy for 2020 and for the planning period 2021–2022" formally suggest a stimulating effect on the Russian economy in accordance with the development priorities outlined. *At the same time, forecasting documents are not supposed to change the identified trend of the increasing tax burden on domestic producers operating in the domestic market.* In the context of the unfolding economic crisis caused by measures to stop the spread of coronavirus and the breach of agreements under OPEC+, the Russian Government is considering emergency measures, including tax, to stimulate business activity.

Prospects for reducing the tax burden on businesses focused on the domestic market are not visible from the text of forecasts and the main directions of government activity.

In accordance with the Decree of the Government of the Russian Federation of 02.04.2020 No. 409 "On measures to ensure the sustainable development of the economy" (hereinafter "Resolution No. 409") support measures are provided for organizations and individual entrepreneurs who are most affected by the coronavirus. According to Decree No. 409, for this category of taxpayers, the payment deadlines for a number of taxes (advance tax payments) and filing a tax return are extended. For organizations and individual entrepreneurs related to small and medium-sized enterprises, the list of taxes and terms of transfers is expanded. In addition, microenterprises are entitled to insurance payments delay. The closing date for transferring taxes (advance tax payments) is 6 months, so the latest deadline for paying compulsory payments was postponed to December 2020.

The deadlines for paying VAT for the first quarter of 2020 are not postponed. However, the deadline to file tax returns for the first quarter is postponed until May 15, 2020.

Another measure in regards to the tax policy was a moratorium (until May 31, 2020)

[10] National accounts. Federal State Statistics Service. URL: https://www.gks.ru/accounts (accessed on 31.03.2020).

on making decisions and conducting on-site (repeated on-site) checks on the completeness of tax calculation and payment concerning transactions between related parties. The deadline for the specified checks has been suspended. The compliance checks conducted by tax authorities have been postponed until May 31, 2020.

An increase in government spending while increasing the tax burden for financial consolidation holds back economic growth.

These measures, regardless of other areas of support, *cannot be considered sufficient t*o help businesses that are limiting their own activities and obligations to preserve jobs and pay for their employees (according to the Decree of the President of the Russian Federation "On measures to ensure sanitary and epidemiological welfare of the population amid pandemic" of 02.04.2020). The main issue is not that organizations and individual entrepreneurs, especially those having small and medium-sized enterprises, will incur losses and have difficulty paying taxes, but the prospects for most businesses to close permanently. In the absence of revenue and significant reserves, a number of small and medium-sized businesses may drop sharply.

According to Sberbank, as of July 2019, small businesses provided 25.6% of jobs in Russia[11]. This is significantly less than in developed countries. However, this segment is of social importance. Mostly small and medium-sized businesses are distributed in the segments of a variety of non-production services: retail, catering, beauty, counseling, etc. These industries were most affected by the consequences of measures taken to stop the spread of coronavirus disease.

It is important to note that this segment of taxpayers is focused on activities within the Russian economy. Their products and investments are for the domestic market, they cater for domestic demand and create a market for goods and services produced internally. Thus, these industries potentially form the basis for sustainable economic growth in Russia. A bigger share of industries supplying the home market in GVA will help to reduce the Russian economy's dependence on oil and gas fluctuating prices.

Thus, despite the proposed measures, the overall tax policy trends do not change. Many of the proposed amendments to the tax and fees legislation are not aimed at supporting the economy during and after the crisis but are a follow-up of the policy outlined in the "Main directions of the budget, tax and customs tariff policies for 2020 and for the planning period 2021–2022".

SUGGESTIONS

The crisis of 2020, the consequences of which are to be assessed, does not lead to the tax policy revision. The implemented measures are temporary. Anti-crisis measures alone should not be permanent. However, in the context of the slow development of the Russian economy since 2014, the current crisis only exacerbated the lingering issues of the tax policy.

The following observation and suggestions should be considered as a reserve for revising the current tax policy when the Russian economy is recovered from the crisis of 2020 and the consequences of measures taken to prevent the spread of coronavirus.

It should be noted that in a state of economic recession, budget expenditures increase will have a greater impact on the income of economic entities and the restoration of aggregate demand than a tax reduction. This conclusion from the theory of J.M. Keynes was confirmed by a sufficient number of empiri-

[11] Sberbank estimated the share of employees in small and medium-sized businesses. RBC: 2019. 22 July URL: https://www.rbc.ru/economics/22/07/2019/5d3594ee9a79478645ac1102 (accessed on 16.04.2020).

cal studies, including those in Russia [17–20]. However, for a business recovery period, the approach of stimulating the economy with fiscal policy measures should be reconsidered.

Researchers note a higher sensitivity of Russia's GDP dynamics to a tax burden increase than to a public procurement increase [17]. Accordingly, an increase in government spending while increasing the tax burden for financial consolidation holds back economic growth. This is the nature of fiscal policy observed recently [21]. The implementation of national projects allows us to maintain total costs given the low consumer and investment demand. Equally, the "tax maneuver" carried out, the fall of oil prices and, as a result, the decrease of oil and gas revenues justify the tax burden increase in the non-oil and gas sector.

The oil prices collapse in March and April 2020 again demonstrates missed opportunities to diversify the Russian economy. In this regard, the ongoing and planned tax burden increase in the non-oil and gas sector exacerbates the problem.

Apparently, businesses focused on the domestic economy will be important for the Russian market in the coming years. In developed countries (USA, Canada), a special taxation procedure and a list of tax benefits for payers are applied to national (domestic) companies operating in the domestic market. In particular, these include S-corporations in the United States[12] and Canadian-controlled private corporations (CCPCs) in Canada[13]. Accordingly, the Russian tax system should provide a special status for taxpayers — legal entities and individual entrepreneurs, which can be applied to domestic economic entities and be valid within the territory of the Russian Federation. This status should be given on the main condition of the use of domestic sources of capital and management by residents and/or citizens of the country.

The status should ensure benefits for VAT and income tax. At the regional level, property and transport tax benefits may be provided.

VAT exemption may be provided with a reduced tax base (for example, by 15%) or the introduction of a single tax rate regime similar to the "flat rate VAT scheme» used in the UK[14] (for example, in the range of 10 to 18%). Studies have shown that the sensitivity of regional GRP is higher to VAT than to income tax increase [18]. In this regard, a reduced VAT rate for taxpayers who have received the status of domestic companies will have a positive effect on regional development and will help to lower sales prices and increase product demand.

In terms of income tax, domestic exemptions should be extended to existing exemptions from quarterly advance payments (Clause 3 of Article 286 of the Tax Code of the Russian Federation), the possibility of applying accelerated depreciation (Article 259.3 of the Tax Code of the Russian Federation) and a tax rate of 0% in case of investments aimed at production modernization and innovations.

Apparently, tax privileges for the generally established taxation regime will be characterized by a wider stimulating effect. Special tax regimes (in particular, the payment of a single tax under a simplified taxation system) can be applied only by entities that can be attributed to small businesses (hereinafter, the special tax regimes do not consider the regime when implementing production sharing agreements). In addition, the exemption of the payer applying the special tax regime from the duties of the VAT payer limits the ability of the organization (individual entrepreneur) to work with organizations and individual entrepreneurs who are VAT payers. Exemption from the duties of a VAT payer makes a taxpayer competitive only in the case of

[12] S Corporations. Internal Revenue Service. URL: https://www.irs.gov/businesses/small-businesses-self-employed/s-corporations (accessed on 24.04.2020).

[13] Corporations. Canada Revenue Agency. URL: https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/corporations/type-corporation.html#ccpc (accessed on 24.04.2020).

[14] VAT Flat rate scheme. URL: https://www.gov.uk/vat-flat-rate-scheme/how-much-you-pay (accessed on 26.04.2020).

retail sales, where the buyer cannot accept the deduction of VAT paid. In the event that the buyer himself is a VAT payer, he is interested in paying the amount of tax included in the cost of goods (work, services). Paid tax amount, if the goods (work, services) are used in activities subject to VAT, is deductible in calculating the amount of tax paid to the budget.

Thus, the use of special tax regimes limits their ability to reduce the tax burden for domestic producers operating in the domestic market. It seems that the benefits of basic taxes, VAT and income tax will help to reduce the tax burden on domestic producers who operate and invest in the Russian Federation.

CONCLUSIONS

In recent years, there has been an increase in the tax burden amid a slowdown in economic growth and a drop in GDP in 2015–2016. A tax burden increase, thus, is an additional factor restraining economic growth in Russia. The analysis conducted in this study showed that an increase in the tax burden is associated with an increase in the burden on labor and consumption, which enhances the differentiation of incomes of the population.

The high tax burden on capital and the relatively low tax burden on labor (despite its growth in recent years) discourage investment in modernization and innovation.

The sensitivity of the tax burden to the dynamics of GDP has been increasing in recent years, and its volatility has increased during periods of cyclical fluctuations, which may enhance the countercyclical effect of tax policy.

The analysis allows us to conclude that it is necessary to reduce the tax burden on those sectors of the economy that are financed by domestic capital and operate in the domestic market.

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Applying UEFA Financial Fair Play Rules and Improving the Financial Stability of Football Clubs Illustrated by the Example of Manchester City FC

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ABSTRACT

This article **considers** the financial monitoring of football clubs under UEFA Financial Fair Play (FFP) regulations. The **aim** of the paper is to study the current system for assessing the financial stability of football clubs and propose measures for its practical application. The work is **relevant** due to a wide range of financial challenges in modern football and supported by a detailed analysis of a recent case of Manchester City football club accused of breaching FFP. Studying the main allegations against the club, the author analyzed the basic concepts of FFP, breaches of other clubs and sanctions imposed on them, with emphasis on the experience of Russian clubs. The analysis illustrated the role of UEFA and football clubs with regards to FFP implementation, considering a specific case. The author estimated the potential losses of Manchester City due to the Champions League ban, and, in addition, the total losses due to the English Premier League suspension amid coronavirus threat. Using FFP criteria, the author analyzed the financial stability of Manchester City and Russian football club CSKA Moscow and identified similar problems for the clubs. The author outlined recommendations for UEFA rules compliance and presented a system of indicators that help to regularly monitor and manage the long-term financial stability of football clubs. The findings of the paper may find application in the field of other team sports.

Keywords: sport economics; sport finance; football economics; football finance; assessment of potential losses; the impact of coronavirus on the economy (sport); financial strategy of a football club

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INTRODUCTION

UEFA's Club Financial Control Body (CFCB) imposed a two-year ban from European competition (2020/2021 and 2021/2022) and a € 30 million fine on Manchester City in February 2020 for breaches of Financial Fair Play (FFP). This is the most severe punishment UEFA has ever handed out since it created its FFP regulations.

One of the most important aims of FFP is to improve financial and economic capability of the club. To achieve this aim, the clubs must demonstrate that their revenue exceeds or equals expenditure, while shareholders are prohibited from covering losses beyond certain limits. The volume of external and internal debt is also tightly controlled and a number of requirements established in terms of youth development, infrastructure, administrative and legal support.

There are a lot of studies devoted to the FFP regulations considering them from both positive and negative sides in the scientific literature. The most significant works are by Vöpel [1, 2]; Szymanski [3–6]; Müller, Lammert, and Hovemann [7]; Preuss, Haugen, and Schubert [8]; Morrow [9], Budzinski [10]; Schubert and Könecke [11]; Bachmaier, Lammert, Plumley,

Wilson, Hovemann [12]; Dietl and Franck [13]; Franck [14], Olsson [15].

There are positive effects of FFP regulations such as creating equal opportunities for all clubs and improving their financial stability. Among negative effects are:

- limited investment;
- inequity in applying rules for teams from different championships;
- applying inappropriate sanctions of bans and fines for clubs in a difficult financial situation;
- subjective approaches to estimate the fair value of sponsorship agreements;
- high costs for monitoring and controlling compliance with the FFP requirements, including justifying the fair value of sponsorship contracts and appealing UEFA decisions;
- inconsistency between FFP break-even requirements and "real" financial situation of clubs, including the costs on youth development, infrastructure, and training facilities.

Gallagher and Quinn B. [16] analyzed the impact of FFP rules on the sporting and financial performance of English football clubs and concluded that UFEA regulations reduce the average efficiency of clubs by raising the relative importance of financial goals whilst lowering the importance of sporting goals. According to the authors, the FFP rules strengthen the financial and sporting power of the elite clubs and undermine the league's competitive intensity by shifting the priorities of clubs from the sporting component to the financial component.

Similar research has been done by Ghio, Ruberti, and Verona [17] but the results are different. The authors find that FFP does not improve the average efficiency of the Italian first division teams, however, FFP has contributed to reducing the gap in terms of efficiency between top teams and lower-tier teams.

Birkhäuser, Kaserer and Urban [18] find that FFP rules have further amplified the competitive imbalance. This might be caused by the fact that FFP raises some barriers against the entrance of new investors and supports the former season's winner.

The author of the present paper analyzes the club licensing system in several European countries and assessed Russian clubs' FFP compliance. In addition, the author suggests recommendations for Russian clubs aimed at ensuring their financial stability [19, 20].

Most scientific research on this problem is theoretical. Additionally, practices have been designed in recent years to keep in line with the regulations. Finally, some FFP rules will be changed in light of the current global crisis. Thus, the aim of this work, which forms its novelty and practical significance, is to consider the practical application of FFP rules based on the experience of European football clubs considering current external challenges, illustrate its main aspects with a specific example and propose a system of indicators aimed at regular monitoring of the financial stability of football clubs.

FFP REQUIREMENTS

It should be noted that FFP rules are not limited to financial performance requirements, which is the result of the complex work of the clubs in several directions.

The *sporting criteria* require clubs to implement a youth development programme approved by UEFA; to protect, safeguard and ensure the welfare of youth players; to ensure a yearly medical examination for all first squad players and establish and apply a policy to tackle racism and discrimination in football. All players must be registered with the UEFA member association and have a written contract.

The *infrastructure criteria* require clubs to have a stadium available for UEFA club competitions and training facilities approved by the UEFA member association fulfilling the minimum requirements defined by UEFA.

Personnel and administrative criteria require clubs to appoint an adequate number of skilled secretarial staff, have an office space, and appoint qualified key personnel.

Legal criteria require clubs to submit a valid declaration confirming their participation in UEFA club competitions, a copy of their current, valid statuses, an extract from a public register or

an extract from the UEFA member association's club register, information about legal group structure and ultimate controlling party at the statutory reporting date.

The financial criteria are set out in the most detailed and in practice, clubs find them challenging.

Clubs must provide the reporting perimeter in the first place, i.e. the entity or combination of entities in respect of which financial information (e.g. single entity, consolidated or combined financial statements) has to be provided. Annual financial statements must be audited.

Clubs must publish the total amount paid to or for the benefit of agents/intermediaries, and the audited financial information on the club's website or the website of the national association.

Clubs must prove that as of 31 March preceding the license season it has no overdue payables. As of the end of March 2020, this deadline was postponed to the end of April due to the spread of coronavirus.

Also, clubs must confirm any significant change that has occurred in relation to any of the licensing criteria, events of major economic importance that may have an adverse impact on the club's financial position after the reporting period.

Submitted future financial information is one of the most important criteria, demonstrating the ability of a club to continue as a going concern until the end of the license season. This information is provided if one of the two requirements has been violated:

1. Going concern.
2. Negative equity — deterioration in net liabilities compared to the previous year.

The break-even requirement is the most important and controversial when relevant expenses must not exceed relevant income by more than € 5 million over the rolling three-year period.

The break-even requirement monitoring period covers three consecutive reporting periods. For example, the monitoring period assessed in the license season 2018/19 covers the reporting periods ending in 2018 (reporting period T), 2017 (reporting period T-1) and 2016 (reporting period T-2).

UEFA considers previous reporting periods — in case of an aggregate break-even deficit for the monitoring period, a club may demonstrate a reduced aggregate deficit due to the break-even results of the two reporting periods prior to the monitoring period (i.e. reporting periods T-3 and T-4). At the same time, there is an acceptable deviation — the maximum aggregate break-even deficit, at which a club is considered to have met the break-even requirement. The acceptable deviation is € 5 million. It can exceed the level up to € 30 million if such excess is entirely covered by contributions from equity participants. Only relevant incomes and expenses, income related to the football activities, are included in the break-even calculation. Income related to non-football operations is not included, for example, operations based at, or in close proximity to, a club's stadium such as a hotel, restaurant, conference centre, business premises, health-care centre.

Additionally, UEFA considers the following indicators:

1. Sustainable debt. At the end of the reporting period T-1, the relevant debt must not be greater than € 30 million and greater than 7 times the average of the relevant earnings of T-1 and T-2. The relevant debt is calculated as the net debt less the amount of debt that is directly attributable to the construction and/or substantial modification of the stadium, and/or training facilities from the inception of this debt until 25 years after the date when the asset is declared ready for use. The relevant earnings for a reporting period are calculated as the sum of total revenue (as calculated for the break-even result) and the player transfers net results minus the total operating expenses (as calculated for the break-even result).
2. A player transfer balance deficit must not be greater than € 100 million in any player registration period that ends during the license season.

3. Employee benefits expenses must not exceed 70% of total revenue.

4. Net debt must not exceed 100% of total revenue.

If a club breaches any of the indicators, it must prepare and submit to UEFA the projected break-even information. In addition, UEFA assesses the liquidity of the license applicant, i.e. the availability of cash after taking account of financial commitments until at least the end of the license season. Besides, a long-term business plan may be requested (including future break-even information up to reporting period T+4). Additional information may be requested from a club regarding its debt situation: the source of debt, the ability to service interest and principal payments, the debt covenant compliance and the maturity profile of debt.

As part of its considerations, the UEFA Club Financial Control Body may evaluate among others the following debt ratios:

i) Degree of leverage — the level of debt relative to revenues and underlying assets;

ii) Profitability and coverage — the level of revenues relative to debt servicing costs;

iii) Cash flow adequacy — the capacity to cover both interest and principal repayments.

UEFA may also take into account additional factors that have a financial impact on the club, such as an unfavorable change in exchange rates. Also, extraordinary events or circumstances beyond the control of the club are considered as a case of force majeure. For example, on April 1, 2020, it was decided to suspend the FFP rules for clubs participating in the Champions League and Europa League in 2020–2021, due to the coronavirus outbreak[1].

As part of its considerations, UEFA may consider if the club is operating in a structurally inefficient football market. The inefficiency of a football market is determined by the UEFA administration on a yearly basis by means of a comparative analysis of the top division clubs' total gate receipts and broadcasting rights revenues relative to the population of the territory of the UEFA member association concerned.

The UEFA Club Financial Control Body will take into consideration the squad size of the licensee and may view more favourably licensees which used a maximum of 25 players (excluding players under the age of 21).

If a club fails to comply with the FFP requirements, it may be subjected to disciplinary measures by the UEFA Club Financial Control Body. The break-even requirements and overdue payables are the most challenging criteria for clubs. The most common sanctions imposed by UEFA include competition bans and fines. It should be noted that clubs may apply for a voluntary agreement with the aim to comply with the break-even requirement. In this case, a club must:

- submit a long-term business plan;
- setting the maximum break-even deficit for several forecasting periods;
- restrictions on players' wages (wages-to-revenue), as well as financial expenses;
- restrictions on receiving prize money;
- restrictions on transfers of players.

In general, despite strict requirements, UEFA is often flexible with the clubs, trying not to punish but to stimulate the development of football. So, at the end of June 2015, some changes were introduced to the Licensing Rules. In particular, UEFA began to take into account the difficulties clubs faced due to the sudden economic shocks or structural market changes in their country. UEFA eased some FFP requirements for clubs that play in countries where the football business is not yet developed and where broadcasting and gate receipt revenues are significantly lower than in the leading leagues. They were promised a preferential, less severe audit, and evaluation regime. Also, clubs looking to invest in infrastructure can contact UEFA to sign a settlement agreement. This is a precautionary measure designed to encourage clubs not to wait until they break the rules of the financial FFP. The main problem is precisely a uniform approach to each club, regardless of the scale of its activities and owners. Examples of UEFA's diverging positions on various FFP rule breaches will be discussed below.

[1] URL: https://www.uefa.com/insideuefa/mediaservices/mediareleases/newsid=2641230.html

ALLEGATIONS AGAINST MANCHESTER CITY AND ESTIMATION OF POTENTIAL CLUB LOSSES

Manchester City committed breaches of FFP regulations in 2012–2016 by overstating its sponsor revenue and failing to cooperate in the UEFA investigation. Additional documents published by Der Spiegel revealed that Manchester City sponsorship was mostly funded by the owners, £ 57 million of the £ 65 million agreement with state airline Etihad, £ 12 million of £ 15 million are from Aabar. Therefore, UEFA's main complaint was the cash infusion of the owners and not the size of sponsorship agreements. The UEFA decision is subject to appeal and will be taken to the Court of Arbitration for Sports (CAS) and then the Swiss Supreme Court (which has jurisdiction over UEFA), and, probably, the sanctions to the club will be reduced.

Manchester City's ban from European competition incurs 2 types of risks:

1. Decreased motivation of players and coaching staff and the need for their additional motivation.
2. Club's revenue losses.

Minimizing the first risk group is possible through the negotiation process, and will also depend on the efforts of the lawyers involved in the appeal of the UEFA decision.

The potential losses of the club from missing European competition depend on the stage of the tournament they manage to reach. In the 2018/2019 season, Manchester City reached the quarter-finals and received £ 86 million from UEFA. If we assume that in the next season the club achieves a similar sporting result, then the losses will be identical. At the same time, this amount may differ both ways, depending on the sporting result. The club will also receive less revenue from ticket sales, merchandise and catering at home matches. On average, each game manages to earn £ 2 million, i.e. on condition of reaching ¼ (5 matches) losses will amount to £ 10m.

Sponsorship deals also have a number of conditions for the tournaments in which the club participates. The club's commercial revenues are estimated at £ 230 million per season. Assuming a 10% cut in the Champions League skip, the club's losses would be £ 23 million.

At the same time, the club re-signed several sponsorship agreements in the new season and expects to increase revenue from selling broadcasting rights outside the UK. Thus, the total revenue should grow. The total amount of losses, taking into account income growth, is presented in *Table. 1*.

However, these are future losses of the next season, while this season the club will lose money because of the suspension of the Premier League and Champions League due to the coronavirus outbreak[2]. The losses will depend on whether the season is finished or the results will be summed up based on the current position of the teams. Revenue losses on match day could be around £ 12 million (assuming 6 home games remain). It is not clear yet whether the clubs will return some of the money to the season ticket holders. The sale of season tickets for the next season may also be delayed, which will affect the cash flow of the clubs.

If the season had not been played out, clubs could have lost £ 750 million for violation of the TV contract. The total amount of the contract is estimated at £ 2.64 billion, i.e. the share of losses is 28.4%. In total, Manchester City was supposed to earn £ 171million, then the loss can be estimated at £ 49 million.

Manchester City also have good chances in the Champions League — the tournament was stopped just before the home match against Real Madrid. Winning this tournament could bring in an additional € 45 million (around £ 40 million) in prize money of € 42 million and an increase in the TV pool by € 3 million. In addition, 3 home matches (assuming the club reaches the final) could bring in another £ 6 million.

[2] The calculations below were made in April 2020, when the decision to resume the Premier League had not yet been made, and the probability of a complete suspension of the championship was high. A more accurate assessment of potential losses can be made as events develop and will depend on the conditions for the start of games and the epidemiological situation in a particular country and in the world.

Table 1

Potential losses of Manchester City due to the UEFA Champions League ban

Source of income	Admission	£ million
Match day revenue	Reaching the Champion League quarter-finals (5 matches per £ 2m)	(10)
UEFA revenue	Reaching the Champion League quarter-finals	(86)
Sponsorship deals income decrease	Sponsorship deals dropped by 10% due to the Champions Leagues ban	(23)
Total losses		(119)
Broadcasting	New Premier League TV deal (overseas rights)	20
Sponsor deals	New sponsorship deal with Marathonbet	10
Commercial deal	New commercial deal with Puma £ 65m instead of Nike £ 20m.	45
Revenue Growth		75
Total net losses including revenue growth		(44)

Source: The Swiss Ramble: UEFA's Club Financial Control Body has found that Manchester City have committed serious breaches, published online 24.02.2020. URL: https://threadreaderapp.com/thread/1231847021973245952.html (accessed on 16.05.2020).

Finally, Manchester City's sponsorship deals incomes are estimated at £ 230 million. Assuming that they are reduced in proportion to the number of unplayed matches (only 10 out of 38 including home and away), the loss could be 26% or £ 60 million.

The total losses of Manchester City from the ban on participation in the UEFA Champions League in the 2020/2021 season, as well as from the suspension of matches of the Premier League and the Champions League in the 2019/2020 season are shown in *Fig. 1*.

ALLEGATIONS AGAINST OTHER EUROPEAN CLUBS

When appealing a UEFA decision, Manchester City will necessarily refer to the experience of other clubs that have also been subject to certain sanctions.

Thus, Manchester City is not the leader in sponsorship deals; there are clubs with more significant support (*Fig. 2*).

In turn, UEFA has never imposed such severe sanctions in case of more serious breaches.

Of the most recent high-profile cases involved Milan, which were related to the debt obligations to the American hedge fund Elliott, which took part in financing a deal totaling € 740 million to acquire the club by a Chinese consortium headed by Li Yonghun and Silvio Berlusconi. Later, the fund issued a large loan of € 300 million, which helped Milan to carry out a large-scale transfer campaign.

UEFA refused settlement agreement with Milan — an approach that has always been applied to the world top football clubs, and in its rigidity is similar to the case of Dynamo Moscow FC (which will be discussed below). The case was referred to the adjudicatory chamber of financial control body (CFCB)

On July 20, 2018, the Court of Arbitration for Sport (CAS) ruled the initial decision of UEFA to disqualify Milan disproportionate for the expected reason — other clubs were imposed fines for similar breaches. Indeed, PSG did not incur any punishment based on the results of the two largest transfer deals: UEFA did not find any obvious breaches of the FFP rules in its actions, however, PSG were obliged to sell players worth € 70 million.

Players' transfers, or rather their financing, are another subject for UEFA's ques-

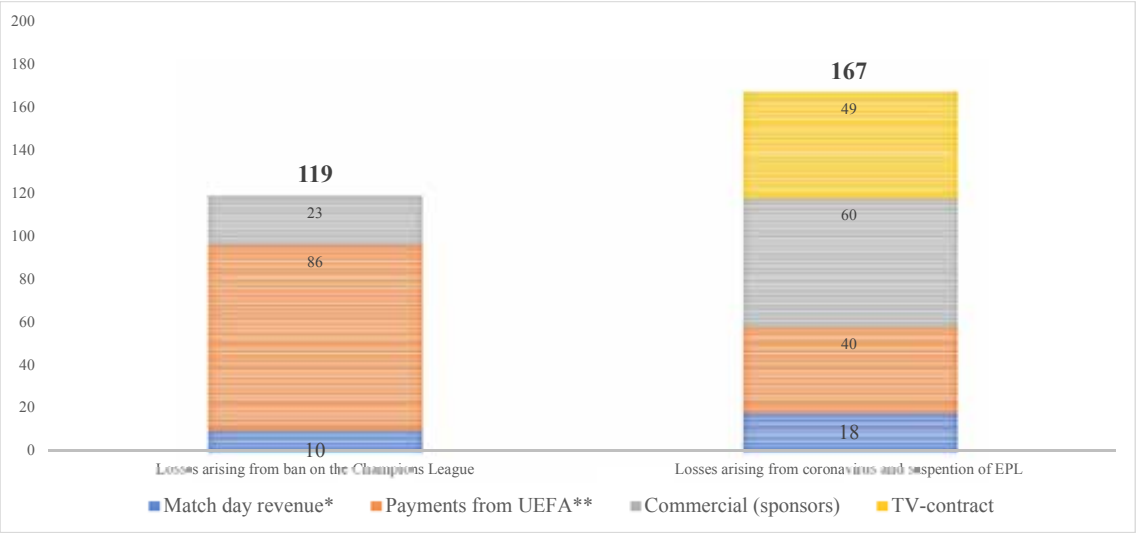

Fig. 1. **Losses for Manchester City, million pounds**

Source: The Swiss Ramble: The shutdown of football until at least end-April due to the coronavirus pandemic, published online 24.03.2020. URL: https://threadreaderapp.com/thread/1242351518319366144.html

The Swiss Ramble: UEFA's Club Financial Control Body has found that Manchester City have committed serious breaches, published online 24.02.2020. URL: https://threadreaderapp.com/thread/1231847021973245952.html (accessed on 16.05.2020).

Note: * £ 18 million: per £ 2 million for 6 home matches in the Premier League and 3 matches in the Champions League.

** For losses from FFP breach the club was admitted to 1/2 final; for losses from tournament suspension – to the final.

tions. Typically, clubs circumvent the cost cap through an installment agreement. Thus, Manchester United issued a transfer to Pogba for € 105 million, reporting expenses only of € 52.5 million. Also, lease with subsequent buy-out is often used, including transactions between related clubs when several clubs belong to the same structure. This is exactly the case of Manchester City, which is part of the City Football Group holding, which owns such clubs as New York City and Melbourne City, as well as minority stakes in Yokohama F. Marinos (Japan), Montevideo City Torque (Uruguay), Girona (Spain), Sichuan Jiuniu (China), Mumbai City (India). In addition to rental deals, a similar holding is used by the club to minimize the payroll. For example, in 2013, Manchester City transferred a large proportion of its employees to City Football Group, cutting wages from £ 233 million to £ 205 million. This has reduced the share of wages in revenue, which UEFA is focusing on. Interestingly, such schemes (both in terms of renting players and in terms of the payroll) are becoming more widespread. Given a large number of investors from China, players may move from European to Asian clubs and then return on lease terms.

The biggest FFP rules breach was in the deal to transfer Neymar from Barcelona to PSG. The player received € 300 million from the Qatar Sports Investments fund as part of an agreement to promote the World Cup in 2022, with these funds he bought his own contract from Barcelona and ended up at PSG already as a free agent. As a result, the French club did not reflect the costs of buying a player at all, and thus, did not violate the FFP rules.

Returning to the allegations against Manchester City, it should be noted that they were conditioned not so much by the amount of the sponsorship contract as by the fact that the funds received by the club did not cover sponsorship but were provided by the shareholder to cover operational losses.

Sponsorship contracts with companies that are also shareholders of the club are not uncommon in European football. Bayern Munich has the third-largest commercial income in

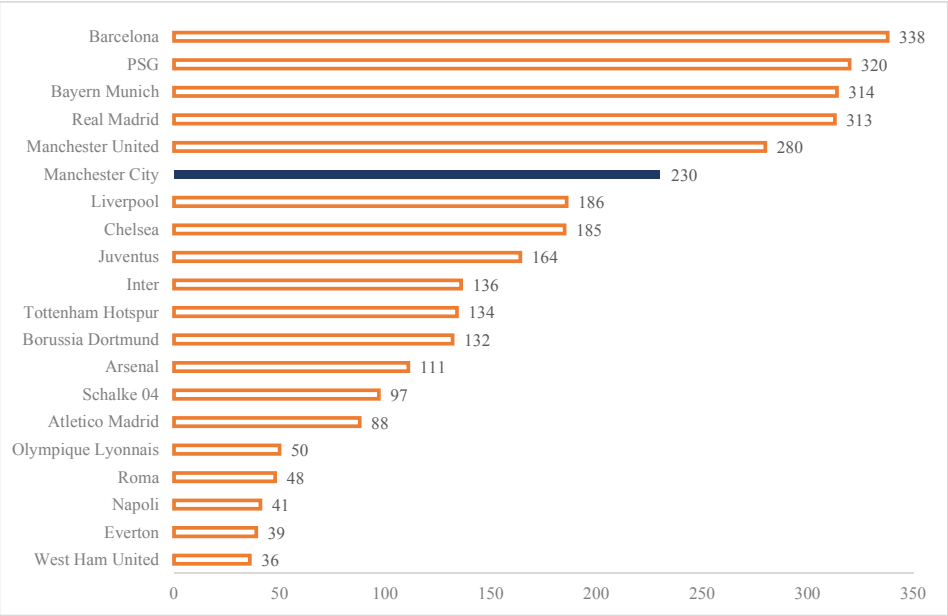

Fig. 2. **The largest sponsorship deals of football clubs in Europe, season 2018/2019, million pounds**

Source: The Swiss Ramble: The shutdown of football until at least end-April due to the coronavirus pandemic, published online 24.03.2020. URL: https://threadreaderapp.com/thread/1242351518319366144.html (accessed on 16.05.2020).

Europe due to the strategic partnerships with three German companies, each of which owns 8.33% of the club's shares (the remaining 75% are owned by fans): Adidas — € 60 million, Audi — € 60 million (recently increased up to € 40 million) and Allianz € 6 million.

Similarly, some of Borussia Dortmund's largest sponsorship deals are with companies that are also shareholders: Evonik (14.78% of shares), title sponsor € 40 million (combined deal with 1 & 1); Puma (5% of shares) — € 31 million; Signal Iduna (5.43% of shares) — € 5.8 million.

The contract value between Juventus and Jeep was increased from € 17 to € 42 million from the 2019/2020 season onwards — 2 years before the end of the contract. This is three times more than Milan, Roma, and Inter receive. At the same time, Jeep is part of Fiat, which belongs to the Agnelli family — the main beneficiary of Juventus.

Finally, another important criterion for UEFA is the club's debt load. In this case, Manchester City complies with this rule (*Fig. 3*).

Thus, the above figures show that Manchester City does not demonstrate the most severe breaches of FFP rules. However, two points should be mentioned. First, the allegations against the club concern the past periods when the violations actually took place. The club's current indicators are fully within the FFP rules. Secondly, one of the most important claims of UEFA is related to the club's refusal to cooperate in the CFCB investigation, and the club's leaked correspondence, confirming this, had an additional negative effect.

Finally, it is important to note that the damage caused by the ban from European competition could lead to losses, which in turn will raise questions from UEFA. This is one of the main complaints about the FFP rules — sanctions lead to new losses, which form a vicious circle.

RUSSIAN PRACTICE

Russian clubs were among the first to face the problem of compliance with the FFP rules. The Dynamo Moscow FC found itself in the most difficult situation [19, 20]. The excess of permissible losses amounted to over € 100 million, and the violations were reduced to three points:

- overstated market value of the contract with the title sponsor;
- attracted loans not secured by assets;

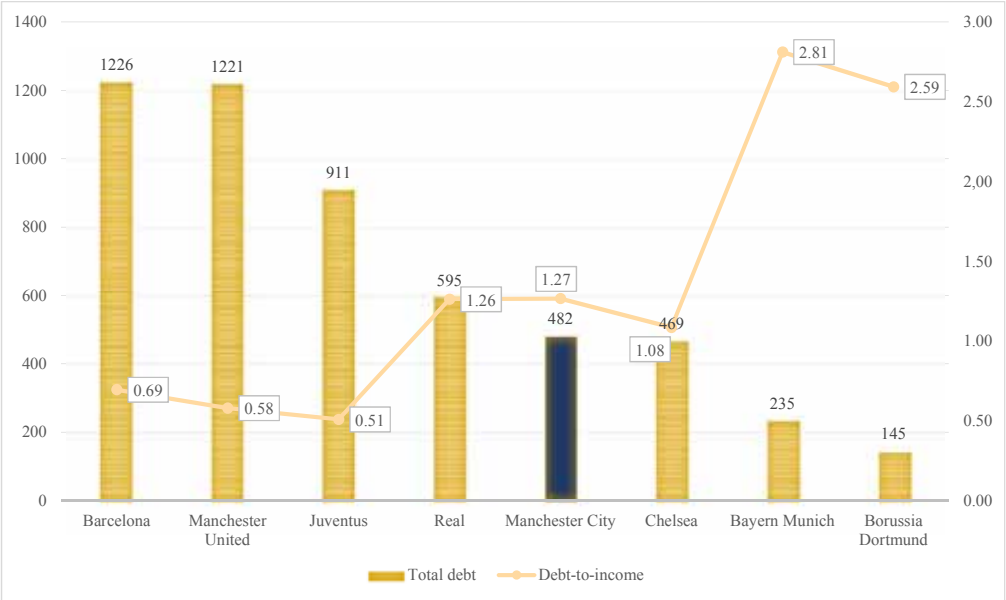

Fig. 3. **The most indebted European clubs (long-term debt plus accounts payable), season 2018/2019, million euros**

Source: The Swiss Ramble: The shutdown of football until at least end-April due to the coronavirus pandemic, published online 24.03.2020. URL: https://threadreaderapp.com/thread/1242351518319366144.html (accessed on 16.05.2020).

- exceeding the share of the players' salaries, 70% of the budget.

Several clarifications should be made regarding the overstated sponsorship contract. In 2009, the club was unable to pay off VTB loans in the amount of about € 200 million, as a result, the bank received a 75% share in Dynamo. With the club, the bank received its assets, namely 41 hectares of land in Petrovsky Park. To compensate the club for the loss of assets, VTB provided the club with financing in the amount of € 80 million per year. However, this was not a sponsorship contract but a payment against future income from the implementation of a development project in Petrovsky Park. In mid 2013, the scheme of cooperation with VTB changed: funds were allocated under a title sponsorship contract. With the onset of the economic crisis, the amount of the contract was converted into rubles and amounted to 4.5 billion rubles a year.

Thus, until mid-2013, the bank's financing was classified for FFP purposes as "excess gains on disposal of property, plant, and equipment". Since the land in Petrovsky Park was put on the club's balance in the 1920s, the market value of the development project was estimated at € 1.5 billion, then payments in installments of € 80 million per year were recognized by UEFA as relevant. However, after the proceeds were reclassified to title sponsorship, the need for a contract value arose. Currently, € 80 million per year is a huge amount even for a European elite club, at the same time Dynamo earned more than the top clubs — Manchester United and Chelsea, with sponsorship deals incomes of £ 53 and £ 40 million, respectively. As a result of the agreement, only € 8 million was recalculated and recognized as relevant income.

The second breach is the attraction of unsecured loans. In August 2013, Dynamo made a number of major transfers. In two weeks, six players from Anji Makhachkala were bought. Moreover, these transactions were paid by using borrowed funds. As a result, the club's net liabilities increased and negative capital was formed.

The third breach was related to the excess of the share of players' salaries with 70% of

the budget. Then it was typical for Russian clubs, it was not considered a breach and was punished with a fine and restriction of the players' applications in European competition.

As a result, Dynamo was subjected to severe punishment — a ban from the European Cups for 4 seasons.

The claims to Zenit were limited to the provision of the club's budget by the structures of the Gazprom group. The parent company officially paid the club € 20.8 million under a sponsorship contract and allocated another € 28 million in donations. Another € 80.4 million were accounted for by 8 companies directly related to Gazprom. The exclusion of these incomes from the list of relevant resulted in losses. However, the club cooperated with UEFA, conducted an audit, restructured its reports, registering all sponsorship deals related to Gazprom under one item. Zenit also presented future financial information. As a result, the club was imposed with a € 6 million fine, restrictions on the transfers of players, and financial monitoring for a period of three years.

Similar allegations were applied against the Lokomotiv Moscow — 94% of the budget (about € 187 million) was provided by a single structure — Russian Railways. The club followed the same path as Zenit, agreeing to cooperate with UEFA, hiring an independent auditor, assessing the real cost of the sponsorship contract, and redistributing the incoming cash flows — the money began to be transferred through another company, not related to Russian Railways. As a result, Lokomotiv was imposed with a fine of € 1.5 million, restrictions on transfers, and three-year financial monitoring.

Break-even requirements were also breached by football clubs Rostov, Krasnodar, Anzhi and Rubin. All of them were fined (from € 0.2 to € 3 million), agreed to impose limits on employees' benefits expenses and transfer costs, and also fell under the application restriction.

RECOMMENDATIONS FOR CLUBS AND FUTURE RESEARCH

Guided by the practice of applying the FFP rules of recent years and the detailed case study of Manchester City, we can suggest recommendations for meeting UEFA FFP requirements.

First, despite the inconsistency of certain FFP provisions, in general, they are aimed at improving the overall health of European club football and the financial conditions of clubs. The improvement in the aggregate financial performance of the European football leagues is shown in *Fig. 4*. These figures should be considered at the club level and take into account the country specifics (for example, the TV deals of the English league makes the main contribution to the improvement of the aggregate financial results of European football). However, the FFP rules played an important role in this.

It is important to note that the damage caused by the ban from European competition could lead to losses, which in turn will raise questions from UEFA. This is one of the main complaints about the FFP rules — sanctions lead to new losses, which form a vicious circle.

The first general recommendation concerns building a transparent and open system of cooperation with UEFA. The European Association always meets the needs of the clubs and shows a willingness to cooperate. The situation with Manchester City confirms this rule. One of the main allegations against the club was precisely the refusal of such cooperation. In addition, the countries of Eastern Europe (with underdeveloped "football market") can count on a number of indulgences due to more modest

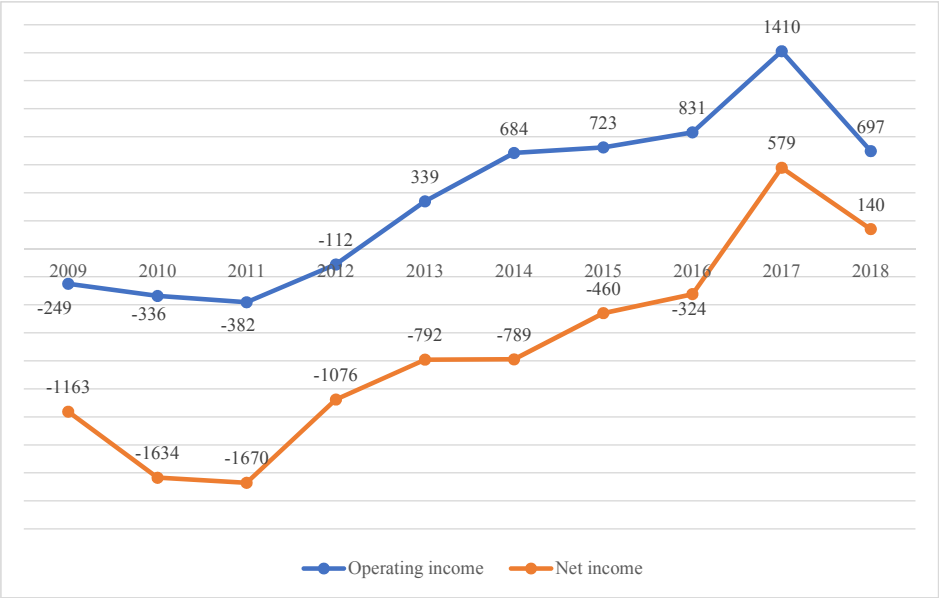

Fig. 4. **Total financial results of all European football clubs, 2018, million euros**

Source: UEFA: The European Club Footballing Landscape. Club Licensing Benchmarking Report Financial Year 2018. URL: https://www.uefa.com/MultimediaFiles/Download/OfficialDocument/uefaorg/Clublicensing/02/64/06/95/2640695_DOWNLOAD.pdf (accessed on 16.05.2020).

starting positions. To illustrate these "positions", it is enough to look at the match day's revenue per fan (*Fig. 5*). If PSG earns € 93.3 per fan for every match, then for RPL clubs this figure is € 6.7. An obvious recommendation in the current situation would be to start an active work with fans, which will increase and diversify revenue.

The following recommendations are based on regular performance monitoring by UEFA. *Table 2* illustrates monitoring data on the example of Manchester City and CSKA Moscow.

These calculations clearly demonstrate the focus of the FFP rules on maintaining the financial stability of clubs. Thus, for Manchester City, player transfer costs are high. It is not possible to correctly calculate the transfer balance since after 2017 the club stopped publishing a cash flow statement, however, it is obvious that expenses exceed income in this case. UEFA's requirements are bypassed by the above-mentioned payment deferred scheme.

For CSKA, the main problem was the loan issued by Vneshekonobank for the construction of the stadium. And at the end of 2019, this problem materialized in the transfer of the club under the control of the lender.

In the context of the considered risks of the coronavirus outbreak and the ban from European competition, the availability of free funds is of particular importance, which will help to withstand at least in the short term. Manchester City, along with the largest English clubs, has such a safety cushion (Fig. 6), which does not apply to other clubs (including Russian). It seems that the current situation will prove to the clubs the need to build reserves.

It should be noted that even IFRS reporting does not ensure a full assessment of compliance with the FFP rules. Additional data is required, which the clubs do not disclose. However, it is realistic to obtain a basic understanding, and it is enough to see the big picture. Calculating the considered indicators will be useful for small clubs that do not yet apply for participation in European competitions, but need to assess the current level of financial stability.

Thus, regular monitoring of the considered indicators with an emphasis on the formation of cash reserves will help ensure long-term financial stability.

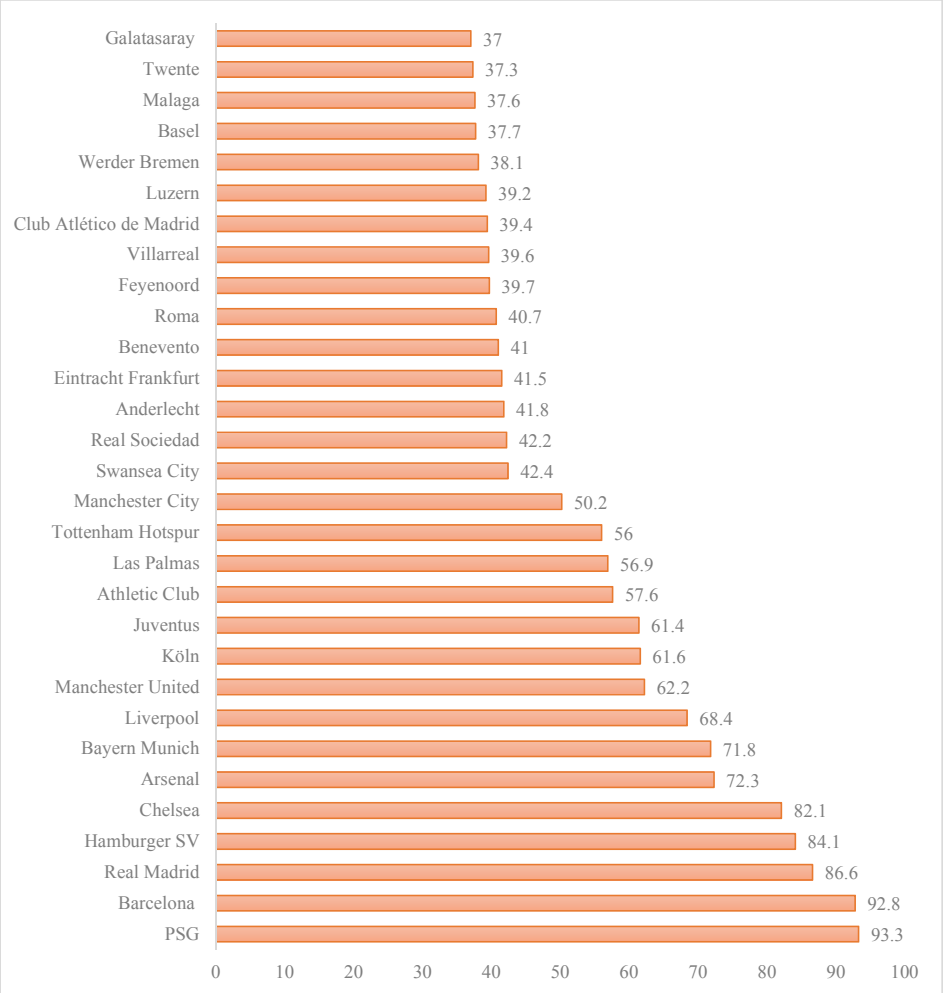

Fig. 5. **Top 30 European clubs in terms of revenue per fan per match, euro**

Source: UEFA: The European Club Footballing Landscape. Club Licensing Benchmarking Report Financial Year 2018. URL: https://www.uefa.com/MultimediaFiles/Download/OfficialDocument/uefaorg/Clublicensing/02/64/06/95/2640695_DOWNLOAD.pdf (accessed on 16.05.2020).

CONCLUSIONS

The case of Manchester City, which breached some of the UEFA FFP rules, was scrutinized in this paper. Studying the main allegations against the club, the author analyzed the provisions of the FFP rules, breaches of other clubs, and the sanctions imposed on them, with a special emphasis on the experience of Russian clubs. The data collected showed that UEFA pays particular attention to the club's approach to addressing identified breaches, the reliability of the information provided, and the willingness to cooperate. The tough sanctions imposed on Manchester City were the result of the opposite approach.

Guided by the criteria in which European football clubs faced the greatest difficulties, the author performed calculations for Manchester City and the Russian PFC CSKA Moscow, which confirmed the challenges relevant to each of the clubs and made it possible to identify a set of indicators that can be used to regularly monitor and manage the long-term financial health of football clubs.

Based on the results of the study, the following recommendations can be proposed for Russian football clubs aimed at complying with the FFP rules and strengthening financial stability:

1. Approval of the list and target values of financial and operational indicators, consid-

Table 2

Indicators of financial stability, calculated for Manchester City and CSKA Moscow

Club	Calculation										Value	Standard	
	Relevant result (T)	=	Operating income	–	Operating expenses	+	Player transfer income	=					
Man City (2019)			538.17		560.314		38.787				16.643		
CSKA (2018)			100.38		87.784		48.566				61.162		
	Net debt (T-1)	=	Long-term interest debt	–	Cash			=				>= annual revenue	
Man City (2018)			65.571		27.855						37.716		✓
CSKA (2017)			272.06		2.079						269.981		☒
	Relevant debt (T-1)	=	Net debt (2018)	–	Debt attributable to the construction or substantial modification of infrastructure			=				<= € 30m <= 7 relevant results	
Man City (2018)			37.716		65.571						–27.855		✓
CSKA (2017)			269.981		272.06						–2.079		✓
	Relevant result (T-1)	=	Operating income (2018)	–	Operating expenses	+	Player transfer income	=					
Man City (2018)			503.491		525.654		39.057				16.894		
CSKA (2017)			76.345		89.469		3.087				–10.037		
	Relevant result (T-2)	=	Operating income	–	Operating expenses	+	Player transfer income	=					
Man City (2017)			475.825		506.004		34.563				4.384		
CSKA (2016)			57.694		91.011		26.602				-6.715		
	Average relevant result (T-1 и T-2)	=	Relevant result (T-1)	+	Relevant result (T-2)	/	2	=					
Man City											10.639		
CSKA											–8.376		
	Relevant debt (T)	=	Net debt	-	Amount of debt attributable to the infrastructure			=					
Man City (2019)			–64.685		65.171						–129.856		✓
CSKA (2018)			310.575		322.425						–11.85		✓

Table 2 (continued)

Club	Calculation									Value	Standard	
	Leverage	=	Net income	+	Assets	/	Total debt with short-term payables	=				
Man City (2019)			10.079		853.093		265.015			325.7%		
CSKA (2018)			25.853		337.103		403.307			90%		
	Coverage ratio	=	Interest on loans	/	Net income				=			
Man City (2019)			5.332		10.079					53%		
CSKA (2018)			15.62		25.915					60%		
	Absolute liquidity ratio	=	Cash	/	Short-term liabilities							
Man City			129.856		186.112					0.7		
CSKA			11.85		70.084					0.2		
	Transfer balance	=	Received from transfers	-	Player transfer expenses				=		>= € 100m	
Man City (2019)			41.576		86.886					−45.31		✓
CSKA (2018)			33.781		10.574					23.207		✓
	Transfer balance (T-1)	=	Received from transfers	-	Player transfer expenses				=			
Man City (2018)			155.47		328.073					−172.603		☒
CSKA (2017)			14.432		6.434					7.998		✓
	Transfer balance (T-2)	=	Received from transfers	-	Player transfer expenses				=			
Man City (2017)			39.02		203.535					−164.515		☒
CSKA (2016)			24.601		10.456					14.145	<=70%	✓
	Wage-to-revenue	=	Wages costs	/	Revenue				=			
Man City (2019)			315.257		535.169					59%		✓
CSKA (2018)			39.68		100.38					40%		✓

Source: compiled by the author on the basis of annual reports of Bluecastle Enterprises Limited as of December 31, 2018, December 31, 2017, December 31, 2016 (USD million) and Manchester City Football Club Limited as of June 30, 2019, June 30, 2018, 06.30.2017 (GBP million).

Note: ✓ — standard observed, ☒ — standard not observed.

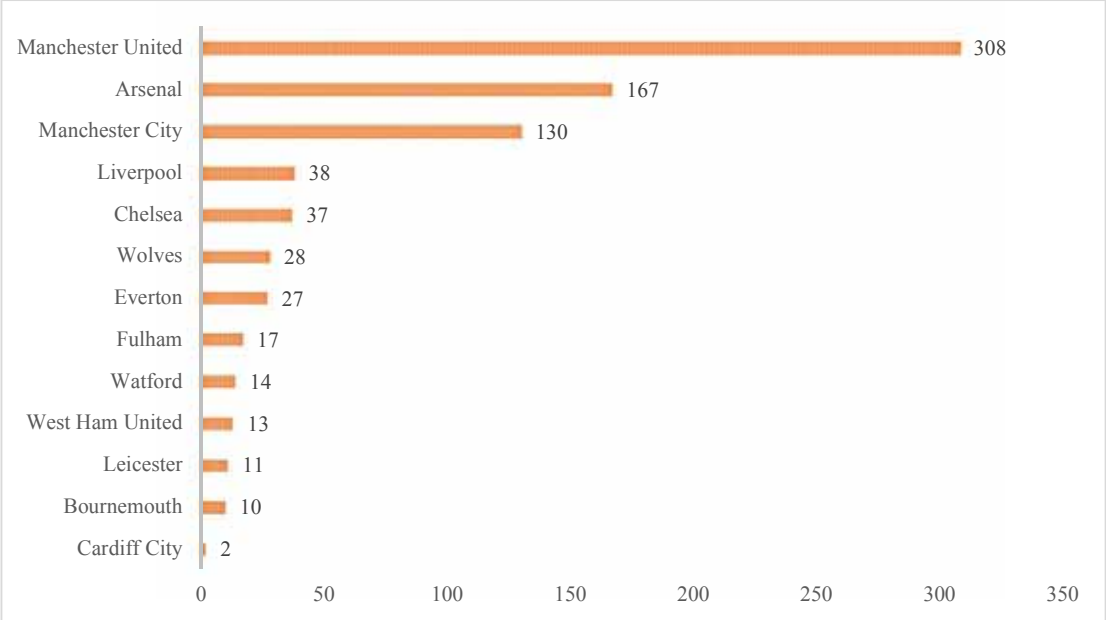

Fig. 6. **Cash balance of the Premier League clubs, 2018/2019, million pounds**

Source: The Swiss Ramble: The shutdown of football until at least end-April due to the coronavirus pandemic, published online 24.03.2020. URL: https://threadreaderapp.com/thread/1242351518319366144.html (accessed on 16.05.2020).

ering the requirements of the FFP rules and building a monitoring system.

2. Creation of a club's financial model, which allows predicting controlled indicators, included in the club's development strategy.

3. Appointment of club personnel responsible for monitoring and compliance with controlled indicators.

4. Approval of the scheme (business process) for the collection and submission of data required for the calculation of controlled indicators.

5. Approval of the system of cooperation with UEFA.

In the future, similar systems for monitoring and managing financial stability may be adapted for other team sports.

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Legal Principles of Taxation in Russia: Essential Reflection in Legislation

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ABSTRACT

The present paper aims to study the nature of taxation principles in Russia and analyze how they are structured and outlined in the legislation. The research is based on general scientific research methods, such as the comparative method and the method of system analysis. The study provides a comparative analysis of the views of Russian and foreign scientists regarding the system of taxation principles and the provisions of the current legislation in the field of taxes. The results of the paper offer that a significant amount of research has been devoted to the problem of the essential reflection of taxation principles but it has not been sufficiently developed and updated. The author argues the need to consolidate the principles of taxation in the current legislation by introducing a special chapter in the Tax Code of the Russian Federation, justifies the need for a fair formation of a system of taxation principles in theoretical and practical aspects. The types and structure of taxation principles in the modern world are proposed. A special chapter has been developed, which the author suggests introducing into the Tax Code of the Russian Federation. The author concluded that in order to reflect the basic principles of taxation in the current tax legislation, it is necessary to introduce the proposed changes.

Keywords: principles; taxation; tax system; tax policy; property; general legal principles; economic principles; taxation principles; taxation equity

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INTRODUCTION

Taxation is one of the clearest manifestations of the powers of a public authority[1], it is an integral part of financial history [1] and has been practiced as an art for a long time but has never been fully explained. Almost all countries of the world levy taxes mainly to increase government expenditure, although for other purposes as well [2]. And a property tax originates from a poll tax (chevage) [3].

Currently, states have developed more sophisticated systems and processes to define who and what should be taxed ("tax base"), and how taxpayers' circumstances and ability to pay should be accounted for [4]. What are the taxation principles and how do they affect our daily life?

One of the most controversial issues both in theory and practice is the formation of a system of tax principles, which are undoubtedly a centerpiece of a modern tax system in any country. However, there are several questions that science cannot provide answers to. For example, approaches to defining the structural essence of some principles and determining the quantitative composition of the existing principles of taxation are highly controversial. Therefore, each country decides to include (or not) the principles of taxation in tax legislation [5]. It is important to note that the scientific works of tax law specialists and economists and other respected scientists, for example, E.A. Lopatnikova, N.R. Kikabidze, N.M. Boboshko, are devoted to the issues of scientific justification of the basic tax principles systematization, as well as the introduction of a separate chapter on this issue in the legislation. However, this aspect is underdeveloped, in particular, the importance of fair taxation, equitable property taxation which is an integral part of taxation, etc.

Thus, the aim of the study is to analyze the existing provisions of the tax legislation, their essence, and structural and logical consolidation in legislation, as well as the views of domestic and foreign scientists on this issue. We are also considering to develop recommendations on the principles of taxation in the current legislation on taxes and fees (hereinafter referred to as 'legislation') and clarify the content of fundamental principles, considering modern realities in the legal field and relations in the field of taxation.

EVOLUTION OF FUNDAMENTAL PRINCIPLES OF TAXATION THROUGH THE PRISM OF HISTORICAL DEVELOPMENT

The necessity to set rules for calculating and paying taxes arose from the need for regular payments to the state [6].

Meanwhile, the taxation system of different countries is formed under the influence of political, social, and economic conditions [7]. It is impossible to build a fair, developed, and efficient tax system without adhering to common basic requirements.

Adam Smith, the economist, and creator of the classical principles of taxation formulated the basic economic principles of taxation in his work "An Inquiry into the Nature and Causes of the Wealth of Nations", later called the "Declaration of Payer Rights". Adam Smith argued that taxation should follow the four principles of fairness, convenience, efficiency, and certainty [8, p. 226]. However, some scholars expressed certain ideas regarding the principles of taxation before the classification proposed by Adam Smith. For example, Pietro Verri in his work "Reflections on Political Economy" [9], as well as F. Yusti [10, p. 194] formulated ideas about the possibility of the tax burden reduction, the need for a certain convenience and equitability of taxation for the taxpayer. Similar ideas were mentioned by such theorists as Victor Riqueti, Marquis of Mirabeau ("The friend of men") [11], and François Quesnay ("Economic table") [12].

Adam Smith not only formulated but also scientifically substantiated these principles,

[1] SOAS University of London: Understanding Public Financial. URL: https://www.futurelearn.com/courses/public-financial-management/0/steps/14705 (accessed on 01.06.2020).

laying the foundation for the theoretical development of the basics of taxation [13].

Based on the theory of collective needs, the German economist Adolf Wagner developed the classical theory of Adam Smith, combining nine basic rules of taxation into four groups of principles: ethical, economic, financial, and principles of tax administration [14].

Consequently, the works of such economists as Adam Smith and Adolph Wagner laid the foundation for a system of principles in tax theory that would unite the mutual interests of both taxpayers and the state. Over time, new principles of taxation appeared, old ones were revised, financial science developed and improved with the development of the tax system [15].

Now the principles of taxation are being formed into an established system that considers the modern realities of the economy [16]. However, in a global context, the content of this system is not generally accepted.

The state is obliged to consider the specific development scenarios of society, as well as be guided by such basic principles of taxation as universality, efficiency, fairness, etc. Deviation from one principle or another can negatively affect the socio-economic situation. Therefore, in order to ensure the progressive and sustainable economic development of the state, it is necessary to consider and observe these principles.

ANALYSIS OF THE PRINCIPLES OF TAXATION ENSHRINED IN THE CURRENT LEGISLATION

Such principles as fairness, certainty, convenience, economy, neutrality, one-off taxation, unity, moderation, budgetary federalism are best known to science. When analyzing them, questions arise: should they be enshrined in legislation? should only the fundamental principles be enshrined? should only those be enshrined that are controlled?

There is no generally accepted approach to the subject among members of the scientific community. For example, as noted in the most significant publication on the theory of taxation, the principles of taxation cannot exist, in legal terms, outside the legal framework that regulates them. Therefore, the main condition for the existence and recognition of the principle is that it must be determined by the law [17].

The author analyzed the practice of consolidating the principles of the tax system in Russia using the Tax Code of the Russian Federation (hereinafter referred to as 'the Code'). Article 3 of the Code "Basic principles of legislation on taxes and fees" establishes several principles that are very important both for the development and for the functioning of the tax system in Russia. Three basic principles are:

- ability to pay;
- legislative establishment of taxes and fees;
- universality and equality of taxation.

The principle of legislative establishment of taxes and fees can be considered as the most important principle. The relevant article of the Code focuses on the obligation of entities to pay statutory taxes and fees, rather than on the legitimacy of taxation charges. In other words, the keyword is "obligation", not "legitimacy".

Consequently, Article 3 of the Code does not indicate that taxes and fees are imposed by law. Unfortunately, the priority of tax legislation over norms in other branches of law is not emphasized anywhere. At the same time, this is one of the fundamental principles, and it cannot be left unnoticed in the norms of tax legislation. This principle, as well as the principle of priority of legislation, should be included in the relevant article of the Tax Code.

The next principle — universality and equality of taxation — is considered fundamental in the legislation. We are referring to the recognition of universality and equality, not the universality and equality of taxation as such. In this case, we agree with the opinion of V. G. Panskov, noting that "... this was not done by chance" [18, p. 20]. Indeed, it is impossible to achieve absolute universality

and equality of taxation, since the concept of "equality" in taxation is practically indefinable, and universality is equal to the fact that there are no persons who are exempt from certain types or all taxes imposed by the state. Therefore, students must pay tax on scholarships, retirees on pensions, etc. A number of critical questions about equality need to be answered, such as whether taxpayers must pay taxes in the same amount or at different rates in relation to the tax base? what to do with the need to differentiate between tax rates and benefits? Analyzing these issues, the author concluded that tax legislation does not quite successfully demonstrate the need to comply with the principle of equality and universality as an established goal when building a tax system.

The next principle of the ability to pay is even less specific in legislation. In this regard, several urgent questions arise. Firstly, how to measure the actual ability of a taxpayer to pay taxes? Of course, each taxpayer is individual and has different values, which are reflected in his needs, marital status, and lifestyle. However, what is a criterion or a set of those that determine the real ability of a taxpayer, or a group of taxpayers or even all taxpayers to pay taxes? It is interesting that the legislator, introducing this principle, emphasizes the need to comply with it and does not indicate exactly what goal should be achieved when building the tax system of the state.

The meaning of the principle of certainty of taxation, which was formulated by Adam Smith, is that legislative acts should be formulated in such a way that each taxpayer knows exactly what taxes (fees, insurance premiums), when and in what order should be paid. Consequently, the procedure, terms, and tax calculation procedure should be set out in the Code in such a way that any taxpayer could understand them [19].

Taxes affect our lives on a daily basis. Almost every country has a complex tax system that only qualified tax advisors/attorneys can understand. Nevertheless, the state expects citizens to comply with the tax requirements imposed on them in full. Citizens have difficulties understanding taxation rules, tax calculations, and terms of payment [20, p. 37–38]. Taxes are complicated [21, p. 102], which is confirmed by domestic [22] and foreign practice[2]. Only trained professionals with relevant qualifications can understand all the intricacies of tax legislation. In this regard, the tax consulting industry has become widespread [23].

A taxpayer, in accordance with Article 21 of the Code, has the right to receive free information/advice from the tax authorities on current taxes, the rights, and obligations of the taxpayer, the procedure for calculating and paying taxes, etc., including in writing, at the local revenue office. Since it is impossible to fulfill the requirements of the principle of certainty, all contradictions, doubts, and ambiguities in the legislation are interpreted in favor of the taxpayer. We believe that it would be reasonable to expand this wording by specifying that the taxpayer has the right "to receive ... information ... provided by a tax authority employee with sufficient qualifications in the field of taxation and tax legislation." In this regard, we conclude that the above principle should be formulated not as a necessary given, but as a goal to strive for.

It is also worth noting that the fundamental and most important principle of fairness is missing from the legislation. Interestingly, in the original version of the Code, this principle was applied in combination with the principle of the taxpayer's ability to pay, arising from good taxation. However, then this rule was excluded and, according to the developer of the code S.D. Shatalov, this provision was removed "not because the legislator does not like fairness but because it is practically impossible to assess the fairness of a particular tax system; the same applies to the ability to pay tax based on the principle of fairness, without any fairness criteria" [24].

[2] INVESTSA Magazine (November 2014): From the editor. URL: https://issuu.com/cosa/docs/investsa_nov_issuu/4. (accessed on 01.06.2019).

However, the absence of this principle in legislation should not mean that taxation should not seek to achieve fairness. Based on the above, we believe that a provision of fair taxation should be included in the Code as a primary objective.

Analyzing the Code, we conclude that the principles of taxation can be classified into legal and economic. As I.A. Maiburov noted, these principles should be legislatively enshrined in the norms of tax law [25]. However, the problem is that, except for the clearly defined principles mentioned above, in accordance with Article 3 of the Code, many of the principles are unclearly formulated and distributed among the various chapters and articles of the Code.

For example, the principle of identifying the elements of tax, which determines its legality in the law, is mentioned in Paragraph 6 of Article 3. It clearly states that all elements of taxation must be identified when taxes are established. The principle of priority of legislation, on the contrary, is not directly formulated as a principle of taxation, and, more importantly, is formulated broadly and in general terms. Also, in Articles 6 and 17 it is said that tax is established only if both the elements of taxation and taxpayers are identified. This principle is not explained.

The principle of neutrality is set out in Article 3 of the Code but it does not have a clear structure and integrity, being in various paragraphs of this Article of the Code. For example, Paragraph 2 states that taxes should consider various social criteria and not be discriminatory, differentiated rates or personal tax benefits are unacceptable. Further, Paragraph 4 prohibits taxes and fees that would in any way restrict the free movement of finances or goods (services, works), as well as violate the single economic space of our country, etc. In Paragraph 5 it is said that no one can be charged with the obligation to pay taxes that do not have their characteristics, etc. Thus, there is no integral consolidation and explanation of this principle.

PROPOSAL TO INTRODUCE A SPECIAL CHAPTER ON THE PRINCIPLES OF TAXATION INTO THE TAX CODE OF THE RUSSIAN FEDERATION

Therefore, we assume it is appropriate to consider introducing a special chapter on the principles of taxation into the Code which should be factored in the development and implementation of both tax policy and the formation and development of the tax system.

We believe that the special chapter should contain two parts.

The first part should introduce principles that have a direct impact, for example, unity of the tax system, publicity, diversity, and differentiation of taxes, the presence of tax elements in legislation, and, of course, the priority of legislation over other legal branches.

The second part should include principles that will guide the development of tax legislation and define the long-term goal towards which both legislative and executive authorities should strive to improve the tax system. For example, such principles as mobility (flexibility), efficiency, and, most importantly, fairness. In our opinion, violation of the above principles by tax and other legislation at all levels should be the basis for protesting such acts.

Thus, we believe that the special chapter may be distinguished as Chapter 1.1. "Principles of Taxation". For example, the proposed Article 12 (or another) will be called "Basic ..." or "Fundamental ..." "... principles of taxation in the legislation on taxes and fees". Further articles should be located in accordance with this title and have a direct impact. Articles 12.1. "The principle of unity of the tax system", 12.2. "The principle of priority of legislation on taxes and fees over other legal branches", 12.3. "The principle of transparency of taxation", 12.4. "The principle of diversity and differentiation of taxes", 12.5. "The principle of elements of tax in legislation", 12.6. "The principle of universality and equality of taxation". Article 12.7. "The principle of fairness of taxation" should introduce a second part

of the chapter, which, as noted, would guide the development of tax legislation. This is followed by Articles 12.8. "The principle of mobility (flexibility) of taxation" and 12.9. "The principle of tax efficiency".

As an alternative to the special chapter, we propose to supplement Article 3 of the Code, which would contain all the above-mentioned principles of taxation.

CONCLUSIONS

Based on the above, we conclude that it is necessary to amend the current tax legislation to fully reflect the fundamental principles of taxation.

At the same time, it is necessary to distinguish the principles that determine the long-term goal towards which the tax system should strive to improve the tax system [the principle of mobility (flexibility), efficiency and, most importantly, fairness], and the principles that the state should strictly adhere to when conducting the tax policy (the principle of the unity of the tax system, transparency, diversity, and differentiation of taxes, the presence of elements of tax in legislation, as well as, the priority of legislation over other legal branches). A clear and precise definition of the principles of taxation and their corresponding consolidation in legislation will contribute to political stability in the country, increase the authority of the state, as well as strengthen the legal tax discipline and correct tax thinking among taxpayers. In our opinion, the tax system in Russia will become more progressive and efficient and will be used by law enforcement agencies as a guide in the implementation of state tax policy. Thus, it is necessary to introduce the special chapter on the principles of taxation into the Code, which should be incorporated in the development and implementation of both tax policy and the formation and development of the tax system.

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