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Translated Article[†]

ANALYSIS OF CREDIT INSTITUTIONS' RISKS IN THE BANCASSURANCE MARKET



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Abstract

Subject The intensifying competition in the financial market urged its residents to create complex products, establish partnership relations and cross-distribution channels. Bancassurance became a new area of cooperation. The business cooperation of banks and insurance companies not only presents new product offerings for customers and enable them to increment their income, but also entails various risks.

Objectives The research studies the premises and nature of banking risks in the bancassurance segment, defines its types, evaluates consequences and outlines preventative measures.

Methods Studying banking risks, I applied methods of logic and economic analysis.

Results I examined the current situation in the bancassurance segment, determined its key trends, pinpointed banking risk factors and proposed the typification of risks detailed as per credit and non-credit insurance. Based on the typification, I conducted the comprehensive analysis of each type of probable scenarios.

Conclusions and Relevance The probability and level of the bancassurance risk depend on the type of an insurance product, status of the bank acting as a beneficiary or agent, bank's affiliation with the insurance company, quality and performance of insurer certification requirements the banks sets. Banking is exposed to serious reputation risks. The opaque partner acceptance system triggers abuses during the transition from collective agreements to agency. The unregulated nature of this aspect may cause massive bankruptcy of insurance companies, undermine the public confidence and corporate customers in financial institutions and damage the megaregulator's reputation.

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Introduction

Discussions. As the contemporary market poses new challenges, today's banking product offerings are much more than a static array of conditions and parameters banks are ready to provide, but rather rapidly adjustable and complex mechanism, which is driven smoothly and effectively by all departments of a bank.

The translational motion of the mechanism depends on multiple related processes pursuing the same goals and

target and being entwined with its through the integration and cooperation of commercial banks with other market actors, i.e. suppliers of goods and services, payment systems and insurance companies.

Such cooperation engenders comprehensive hybrid products in the market (credit cards and installment cards as their derivative option, which offer various bonuses, grace periods, cashback, insurance products that are provided for loans, credit cards and ownership, etc.). CRM systems get more complicated year on year, with cross-selling channels growing steadily.

The advantage of such synergy is obvious. Credit institutions expand their clientele offering a compound

[†]For the source article, please refer to: Юсупова О.А. Анализ рисков кредитных организаций на рынке банкострахования // Финансы и кредит. 2018. Т. 24. № 11. С. 2486–2502.
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product and earning partners' fees per each new customer. As a rule, they attract partners' customers, offering beneficial terms of loans and cash management.

Bancassurance is one of relatively new areas for mutually beneficial cooperation, i.e. cross-selling of banking and insurance products at banks' points of sales since these are banks that act as financial intermediaries in this scheme, possessing more reliable and sensitive data.

I analyzed bancassurance issues from perspectives of proceedings by O.D. Averchenko [1], E.S. Alekhina, I.N. Tret'yakova, A.E. Yablonskaya¹, I.V. Babenko, A.I. Babenko², A.V. Zaitseva [2], G.F. Ruchkina [3], E.G. Sarsenova [4], T.Yu. Tarasova³, G.I. Shepelin [5], M.K. Yurik⁴.

The fact that bancassurance parties are lured to cooperate is supported with statistics of the Central Bank of Russia acting as the megaregulator in the financial market (*Fig. 1* and *2*).

As showed in the *Figures* herein, insurance premiums in 2017 grew up by 8 percent mostly after a 15-percent increase in insurance compensation paid under insurance contracts secured by intermediaries, which amounted RUB 121,835.7 million in absolute values. Consequently, it captured an additional 4 percent of total insurance compensations in comparison with 2016, accounting for almost 75 percent.

¹ Alekhina E.S., Tret'yakova I.N., Yablonskaya A.E. [Theoretical aspects and current development trends in bank insurance in Russia]. *Finansy i kredit = Finance and Credit*, 2015, vol. 22, iss. 26, pp. 25–38. URL: <https://cyberleninka.ru/article/n/teoreticheskie-aspekty-i-sovremennye-tendentsii-razvitiya-bankostrahovaniya-v-rossii> (In Russ.)

² Babenko I.V., Babenko A.I. [Bancassurance as a financial category. Evaluation of the Russian bancassurance services market]. *Finansy i kredit = Finance and Credit*, 2016, vol. 22, iss. 4, pp. 11–25. URL: <https://cyberleninka.ru/article/n/bankostrahovanie-kak-finansovaya-kategoriya-otsenka-rossiyskogo-rynka-bankostrahovykh-uslug> (In Russ.)

³ Tarasova T.Yu. [Bancassurance as a method for financial intermediaries to cooperate]. *Vestnik Khabarovskogo gosudarstvennogo universiteta ekonomiki i prava*, 2016, no. 3, pp. 4–8. (In Russ.) URL: http://www.vestnik.ael.ru/Portals/13/hgaep_umm/2016_vestnik_n3/%D1%82%D0%B0%D1%80%D0%B0%D1%81%D0%BE%D0%B2%D0%B0_%D1%81%D1%82%D0%B0%D1%82%D1%8C%D1%8F_%D0%B2%D0%B5%D1%81%D1%82%D0%BD%D0%B8%D0%BA.pdf

⁴ Yurik M.K., Petrov K.S. [Some theoretical and practical aspects of the bank insurance]. *Finansy i kredit = Finance and Credit*, 2010, no. 24, pp. 66–72. URL: <https://cyberleninka.ru/article/v/nekotorye-teoreticheskie-i-prakticheskie-aspekty-bankovskogo-strahovaniya> (In Russ.)

Interestingly, while the remaining intermediary-based options to obtain insurance premiums shrank (intermediary services of individuals and legal entities, brokers and car sellers, which are statistically highlighted by the Central Bank of Russia), insurers saw their financial proceeds from credit institutions increase, going up by RUB 99,687.6 million, or 6%, thus covering 41 percent of insurance premiums under intermediary contracts in 2017 year on year.

In pursuit of profits as the main goal of their activities, commercial banks earn respective fees from insurance companies. The composition and dynamics of fees, which insurance companies pay to their intermediaries, are given in *Table 1*.

Referring to *Table 1*, we note these are credit institutions that benefited most of all in comparison with other intermediaries cooperating with insurance companies. In addition to the most notable absolute increase in insurance compensations, which is about RUB 97 billion in 2017 due to the record high amount of insurance premiums banks remitted under contracts (*Fig. 2*), the fee rate is 25 percent of insurance premium, i.e. twice as high as a similar rate for insurance brokers (12 percent). What is more, it is noteworthy that these are payments to banks that demonstrate more or less upward trend of 2.6 percent against 2016 among all intermediary's fees, while payments to individuals dropped by 4.1 percent.

The business cooperation of banks and insurance companies not only improves the customer satisfaction level but also enables both of them to effectively use the banking infrastructure and distribution network by insurance companies in particular.

Analyzing the current situation and trends in the bancassurance market, I hypothesize that its actors strive to derive profit within a short period of time without triggering long-term consequences, thus causing various risks, which, I assume, depend on the following factors:

- type of insurance products;
- the bank's status of beneficiary/agent;
- legal basis for the relationships between the bank and insurance company (whether they are affiliated or not).

As this article focuses on risks associated with banking and bancassurance in particular, I sort them out

chronologically (*Fig. 3* presents the proposed typification of risks).

Delving into the substance of risks indicated in *Fig. 3*, let us refer to the following facts.

Banking is inseparable of loan repayment insurance. As banks see their loan portfolio and value of pledged property increasing, the capacity of the credit risk insurance market expands as well. Although some issues of credit product insurance are solved, there are still some pending matters concerning the elimination of risks associated with credit insurance.

On June 1, 2016, Instruction of the Central Bank of Russia of November 20, 2015 № 3854-У, *On the Minimum (Ordinary) Requirements to the Terms and Procedure for Certain Types of Voluntary Insurance*, came into effect. As per paragraph 1 of the Instruction, when the insurer enters into an insurance contract (save for some exceptions), it should stipulate the refund of insurance premium to the insured party within 14 consecutive days from the signing date of the contract no matter when such insurance premium is paid. Thus, providing for the cooling-off period, law-makers intended to protect customers from insurance services banks sometimes force them to use [6]. In such circumstances, borrowers are hustled to decide. They sign a loan agreement, without scrutinizing its terms properly and actually having an opportunity to decline it beforehand.

Such a novelty may seemingly be positive for the financially literate borrowers who intend to get their money back, being obfuscated by loan managers. However, things work in a different way.

The interaction of banks and customers and respective credit product issues were studied by P.A. Grishin, A.A. Tsyganov [7], E.A. Rusetskaya [8], D.V. Bryzgalov, A.D. Yazykov, A.G. Semenyuk [9].

Counting on the subsequent refund of insurance premium, the borrower must consider provisions of paragraph 11, Article 7 of the Law, *On Unsecured Lending*⁵. As per the Law, if the borrower refuses to insure his/her unsecured loan, the bank is empowered to increase the interest rate on such an unsecured loan, offering an alternative lending option or require the borrower to pay it ahead of schedule.

⁵ Federal Law of December 21, 2013 № 353-ФЗ, *On Unsecured Lending*.

This provision seem rather fair since the borrower's refusal from insurance makes the loan more risky for the bank. This is envisaged in paragraph 4.8 and paragraph 6.3.1 of the Regulation for Credit Institutions to Make Provisions for Losses from Loans, Credit or Equal Debts. As per the Regulation, if the borrower agrees to conclude the life/health insurance contract (insurance in case of disability, accident, disease of an individual) and provides a collateral, this may seriously influence in estimating the provision for possible loan losses⁶.

Therefore, if the borrower cancels the insurance policy during the cooling-off period, the bank may substitute one source of income, i.e. fees from the insurance company for its insurance product sold, with another one, i.e. the additional charge on the interest rate on a loan to set off the increased risk exposure. However, in the first case, the bank will surely derive its income when summing up sales of the insurance company's products. In the second case, income is deferred and probabilistic by nature because the borrower's inability to pay is concerned.

Trying to mitigate the risk, commercial banks offer (seemingly) very beneficial terms of loans, including the insurance policy. Therefore, banks persuade customers to opt for such insurance-inclusive products in comparison with identical ones without insurance add-ons. However, if we make a closer look at the substance of both products and different banks' propositions, we reveal almost equal pricing. For example, applying to UniCreditBank for an unsecured loan, the borrower will pay 13.9 percent per annum if the insurance policy is included into the loan agreement, or 17.9 percent per annum if the insurance-free option is chosen⁷. The insurance rate of the first option will be 0.3 percent of the loan per each month of the loan agreement term, or 3.6 percent per annum. Thus, the gross rate on the insured loan equals 17.5 percent (13.9% + 3.6%).

The insurance policy protects the borrower for the entire period of the loan agreement within the amount of insurance coverage, which equals the amount of the unsecured loan. In the mean time, it hedges the bank

⁶ Regulation of the Central Bank of Russia of June 28, 2017 № 590-П, *The Procedure for Credit Institutions to Make Provisions for Possible Loan Losses, Loans and Identical Debts*. URL: http://www.consultant.ru/document/cons_doc_LAW_220089/ (In Russ.)

⁷ Unsecured loan requirements. URL: <https://www.unicreditbank.ru/ru/personal/borrow/cash-loans/conditions.html> (In Russ.)

acting as the beneficiary against the insurance risk and brings an immediate income, which approximates 25 percent of the respective fees on average (0.9 percent in the analyzable case) (please refer to *Table 1* for explanatory comments), because insurance premium is paid on a one-off basis when the loan is made available under the loan agreement.

The cooling-off clause permitted borrowers to have their insurance premiums refunded before the insurance contract comes into force. However, as a matter of fact, with due regard to timing and cost of new terms of an insurance-free loan, this makes such a refund unreasonable, improbable in terms of the bank's risk, thus anyway enabling the bank to derive income from a virtually risk-free product.

The borrowers is well aware of the insurance product cost since. As per paragraph 2, Article 7 of the Law, *On Unsecured Lending*⁸, offering borrowers additional services for an extra fee, including the insurance of life and(or) health, banks receives the borrower's consent for insurance services, including the conclusions of other contracts, which the borrower is to sign with respect to the unsecured loan agreement.

In an unsecured loan application, the creditor indicates the value of a service it offers and allows the borrower to accept or reject the service, including through other contracts which the borrower is to conclude with respect to the unsecured loan agreement.

When an unsecured loan is concerned, the law does not require the borrower to have his/her life, health, employment necessarily insured. However, what really and essentially helps sell insurance product is that the would-be borrower has already reviewed what banks offer and got understanding of the effective interest rate on loans. However, the borrower may be barely cognizant with the insurance market, being unable to evaluate the appropriateness of insurance tariffs and accepts the bank's proposition.

Having analyzed the effective laws, I found that the risk of insurance rejection is not common for all credit products of banks since borrowers are not always allowed to choose whether they accept insurance services or not.

First of all, it concerns the mortgage insurance (Article 31 of Federal Law of July 16, 1998 № 102-ФЗ, *On Mortgage (Pledge of Property)*). As per the Law, if the

⁸ Federal Law of December 21, 2013 № 353-ФЗ, *On Unsecured Lending*.

borrower cancels the insurance contract he/she is bound to conclude for mortgage, he/she must enter into a new insurance contract with the insurer in compliance with the bank's requirements.

I suggest analyzing bancassurance risks associated with mortgage.

As per the law, the pledged property insurance is meant to protect and preserve the property. As specified in paragraph 1, Article 31 of Federal Law of July 1, 1998 № 102-ФЗ, *On Mortgage*, the mortgage insurance contract shall pursue interests of the mortgagee (beneficiary), i.e. a credit institution. The insurance clause protects the mortgagee's interests because it really needs to avoid the loss (destruction) and damage of the pledged property. The insurance risk of the pledged property loss (destruction) implies that it may be totally destroyed. The damage risk means its partial loss or substantive modification. The parties to the mortgage contract may enlist insurance risks in line with distinctive features of the pledged property, its location. If these aspects are not specified, insurance is based on general risks (for example, the risk of loss or damage of property due to fire or explosion, natural calamities, technological disasters, unlawful actions of third parties).

Insurance redirects pecuniary losses from the mortgagor to the insurer, which undertakes to indemnify losses caused to the insured property (insurance payout) in case of an insurance event within the contractually stipulated amount (insurance coverage).

Undoubtedly, the effective laws associate terms of mortgage contracts with a certain insurer. They simply sets the scope of discretion which the party in charge of insurance should mind when entering respective contracts.

Whereas, as per general rules, the pledged property shall be insured so to cover its full value, or, if its value exceeds the mortgage liability, the value of the creditor's claim secured with the mortgage, the absolute value of the insurance policy will be quite substantial.

In the case of mortgage, the credit institution is not exposed to the risk that the borrower declines an insurance offer because it is compulsory. However, acting as the beneficiary with respect to an insurance product, the bank cannot derive income by selling it, thus having the loss of opportunity.

As prescribed in the Resolution of the RF Government, *On Instances of Permitted Agreements between Credit Institutions and Insurance Companies*⁹, the bank is not allowed to act simultaneously as an agent and beneficiary under insurance contracts.

Under such circumstances, banks lawfully establish insurance affiliates (or, on the contrary, insurance companies found banks). Therefore, as a matter of fact, the single corporate organism offers customers to acquire the full package of financial services, including key banking and insurance products. VTB Insurance, RSHB Insurance, AlfaStrakhovanie Group, Absolute Insurance, UralSib Insurance Company, etc. are the best representation of the above configuration. Banks and insurance companies within such groups also deal with capitalization issues by reallocating funds within the group. Handling the substantial volume of long-term funds, insurers can place them for a short period time with a credit institution, say, as short-term investment, finance of export and import.

In this respect, the sales department of the bank needs to persuade the borrower to conclude the mortgage insurance contract with the affiliated insurance company. Trying to maintain the competition, the Resolution, *On Instances of Permitted Agreements between Credit Institutions and Insurance Companies*¹⁰, require credit institutions to accept insurance contracts with any company borrowers choose provided that the later is compliant with credit institutions' requirements.

As prescribed by the law, the bank must inform its borrowers of uniform requirements to insurance companies, terms of services, timelines for checking necessary data and documents of an insurance company. Avoiding the loss of income in case borrowers choose unaffiliated insurance company, credit institutions deliberately obstruct such an option by setting specific and particular requirements to third party insurers, which only the affiliated insurance company can meet, thus generating all financial flows from mortgage within the group.

This idea is confirmed by Irina Baranova, the head of the retail banking department a UralSib Bank. She says the accreditation of an insurance company implies the

verification of its financial reliability and ability to perform its obligation to customers. Whereas each banks sets its own criteria, banks offer a different number of insurance companies to choose¹¹. According to Viktor Klimov, the head of the All Russia People's Front, For the Rights of Borrowers, first of all, banks try to promote services of those insurance companies which pertain to the same holding group¹².

If the central Bank of Russia maintains the low inflation rate as targeted as part of the monetary policy and funding gets more affordable due to a drop of the key rate, the interest rate on loans may reduce, thus spurring a growth in all lending segments [10]. However, the low rate of economic growth, intensifying competition for good borrowers, shortage of capital to cover risk and relocation of some retail deposits to more lucrative sources of investment substantially influence the lending activity of banks and make them search for additional sources of intermediary fees.

According to forecasts of the RA Expert Rating Agency, in 2018 bank's portfolio of loans will presumably grow by 6 percent and slightly outperform a 4-percent level recorded in 2017. As analysts emphasize, striving to offset a drop in the margin of loans and its sluggish growth, banks will be actively augment their interest-free income, thus increasing the profitability of the sector up to 10.5 percent (against 8.3 percent in 2017) and pushing it one-third closer to the pre-crisis level of 15–18 percent.

Considering the analyzable bancassurance market, it is interesting to note that the lending market will still be driven by retail loans as was in 2017 due to the positive trends in real disposable income of the population. Whereas experts, first of all, expect the portfolio of unsecured loans of individuals to increase (10 percent against 6 percent in 2017), concurrently having high margin and risks, it is possible to forecast a sales growth in the credit insurance market. The mortgage portfolio is expected to grow by 16 percent as a result of the launch of the Agency for Housing Mortgage Lending (AO DOM.RF since March 2018), governmental program for subsidizing the interest rate for families with many children, reduction in the coefficient the

⁹ Resolution of the RF Government of April 30, 2009 № 386, *On Instances of Permitted Agreements between Credit Institutions and Insurance Companies*.

¹⁰ Resolution of the RF Government of April 30, 2009 № 386, *On Instances of Permitted Agreements between Credit Institutions and Insurance Companies*.

¹¹ *Dovesok k kreditu: mozjno li otkazat'sya ot navyazyvaemoi strakhovki* [Add-on to the loan. May the borrower decline the aggressive offering of insurance services?]. URL: <https://www.rbc.ru/money/27/10/2017/59edefdf9a79472c786b0310>

¹² Ibid.

securitization influences the capital, thus stimulating banks' intentions in the bancassurance segment.

In addition to the above efforts made to mitigate the risk of lower income or its loss, banks actively refocus from personal insurance contracts to collective ones which are not subject to the cooling-off clause.

What distinguishes personal insurance contracts (respective risks are reviewed above) is that such contracts are concluded by individuals (the insured) and legal entities (insurers). The insured (borrower) acts as the beneficiary and receives the insurance compensation in case of an insurance event. The insurance compensation depends on individual characteristics of the customer (age, work, insurance track record, etc.).

Collective insurance contracts help banks mitigate the risk of additional income in retail lending. Collective insurance contracts are made between banks and insurance companies. The lending bank, which hedges itself against risks of the borrower's default, is the beneficiary in such a scheme. The borrower is supposed to join the existing collective insurance plan. Whereas it is the bank that acts as the insured under collective insurance contract, such contracts are impossible to reject, though the plan accession costs are borne by the borrower.

The Central Bank of Russia plans to apply the cooling-off clause to collective insurance contract as well. It just ponders over the appropriate legal construct for this novelty. This will trigger the credit risk of the banking sector, thus correspondingly editing terms of lending propositions in the market.

As seen in the bancassurance segment today, banks serve as distribution channels for almost all types of insurance products. Although retail loans are more often than not supplemented with property insurance, protection from financial risks, accidents and life insurance, non-credit insurance product account for the substantial share of products sold through banks.

Private customers often apply for the following non-credit insurance products:

- life insurance;
- credit card fraud protection insurance;
- personal insurance of the deposit holder;
- travel insurance [11—15].

The above products can be sold without being inseparably attached to the respective banking product, putting pressure on customers by modifying terms of a deal in case customers decline the insurance option, lowering the probability that such a deal will be approved, or restricting access to refinance and restructuring programs.

In such circumstances, the bank's risk of insufficient fees from intermediated sales mostly arise from the talent, professional level of its staff and capability to customize the proposition.

In the non-credit insurance segment, I should mention its subtypes, which do not substantively relate to risks associated with a loan, but virtually influencing its approval. Such insurance products make a loan more expensive for the borrower, while being almost impracticable in case of an insurance event. For example, emergency roadside service, call and assistance of a commissioner in case of a road accident, car repair assistance, jump-starting of a car, replacement of a flat tire, towing, legal assistance, etc.

Intermediated sales of the above services usually generate fees for small and medium-sized banks, which are not very much concerned with their reputation risk. Discussion boards on the Internet feature opinions of customers who became captive consumers of such services credit institutions compelled them to accept.

Serious reputation risks are an integral part of credit institutions' activities in bancassurance. Regardless of the business and legal design of bancassurance architecture (consolidated business or partnership), it is the bank that serves as a counter selling an insurance product. That is why the bank is perceived to be primarily responsible for the quality of the insurance product.

What happened with Allianz Insurance Company in 2014, which served the largest banks in the financial market (VTB 24, OTP Bank, Home Credit Bank), really damaged the reputation of those banks, notwithstanding performance guarantees. According to Tat'yana Nikitina, the head of the Insurance Company Rating, Allianz wound up its retail practice since it had been demonstrating negative results for several years¹³.

Facing such a situation, a financially literate customer cannot but raise a reasonable question. How could an insolvent insurance company be accredited by the

renowned banks, continuing to be as such for several years?

The Regulation of the RF Government, *On Instances of Permitted Agreements between Credit Institutions and Insurance Companies*, governs the accreditation procedure only in terms of the antitrust law, forbidding banks to set up artificial barriers so to better position the insurance companies they partner with (for example, stipulating the authorized capital, amount of insurance premium, insurance reserves, equity of the insured in assessing its financial viability as part of the accreditation requirements). Hence, banks could undertake preventative measures before and after the clause came into effect.

Banks are often biased when accrediting insurance company. Having reviewed websites of credit institutions, I pointed out the following requirements they may set for insurers seeking to get accredited by the bank:

- 1) versatile activities of the insurance company (the insurance portfolio does not focus on one or two types of insurance services);
- 2) more than three years of insurance practices;
- 3) effective licenses and credentials allowing the insurance company to offer certain insurance products;
- 4) permanent office (branch, local office, etc.);
- 5) high capitalization;
- 6) limited concentration of financial and credit risks in the insurance portfolio;
- 7) transparent composition of shareholders;
- 8) non-existent pending instructions/writs/notices restricting the insurance company's operations;
- 9) non-existent instances of license suspension within a certain period, which is usually taken to equal a year;
- 10) no bankruptcy proceedings in progress;
- 11) solvency corroborated with the analysis of financial indicators;

12) available reinsurance programs, including international reinsurers of the investment class;

13) no negative experience for the bank in dealing with the insurance company;

14) presentation of financial statements with the information the bank needs;

15) insurance contracts compliant with the bank's requirements.

Having analyzed the composition and content of the requirement, I concluded they are rather exhaustive and mostly provide for all necessary and sufficient conditions for the bank to choose a reliable partner.

However, the problem is that the ultimate selection criteria for insurance companies remain the exclusive knowledge of the bank. Neither regulatory document clearly indicates them, leaving them quite opaque for the insurance market actors.

Furthermore, cooperating with several insurance companies, the bank, on the one hand, diversifies its own risks, and assumes partners' risks, on the other hand.

The bank can be exposed to the reputation risk even within the same consolidated group. The insolvency of Rosgosstrakh Insurance Company, a company of Okritie Group, is an illustrative case.

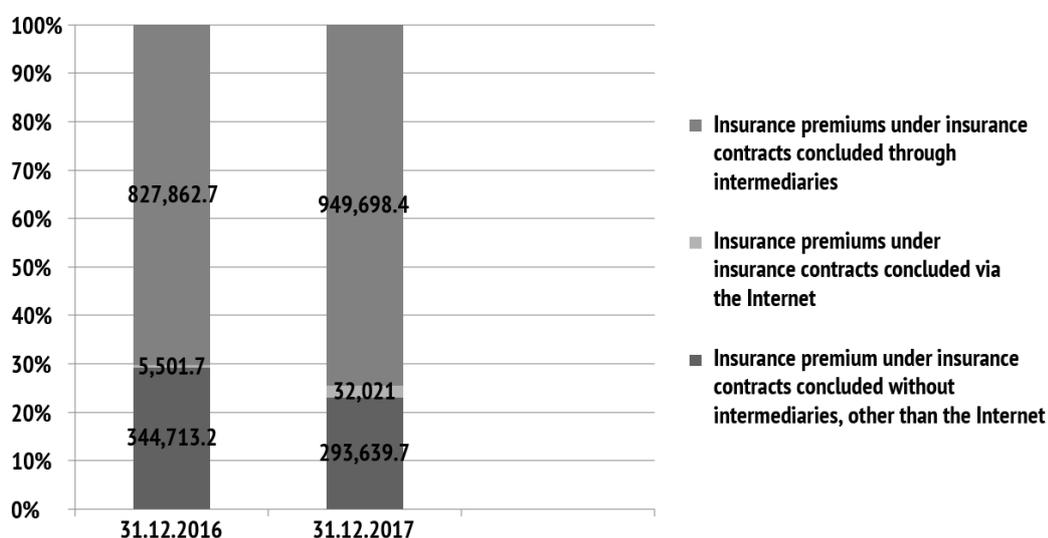
In the Russian bancassurance segment, profound causes of banking risks analyzed herein are rooted in systemic operational issues of banks and insurance companies. The fact that they remain unregulated may ignite a financial disaster in the nearest future. If, vying for competitive advantages, insurance companies continue reducing tariffs and increasing the amount of banks' agency fees, which outperform a growth in the insurance market, this will inflict the massive bankruptcy of insurance companies, loss of people and corporate customers' confidence in financial institutions, detriment of the megaregulator's reputation. The non-transparent accreditation mechanism and total transition from collective contracts to agency-based relationships will fuel abuses that parties may commit pursuing easy gains.

Table 1**Structure and dynamics of fees paid by insurance organizations to intermediaries, million RUB**

Item	31.12.2016	Percentage	31.12.2017	Percentage	Absolute change	Growth rate, %
Intermediary fees (credit institutions)	77,366.1	45	96,858.6	47	19,492.5	125
Intermediary fees (individuals, including sole proprietors)	53,684.2	31	55,210.9	27	1,526.7	103
Intermediary fees (other legal entities)	17,609.8	10	21,471.1	11	3,861.3	122
Intermediary fees (entities trading in motor vehicles)	11,338	7	13,887	7	2,549	122
Intermediary fees (insurance brokers)	3,086,3	2	4,222,2	2	1,135.9	137
Total intermediary fees	172,502.7	100	204,280.6	100	31,777.9	118

Source: Authoring based on the Central Bank of the Russian Federation data.

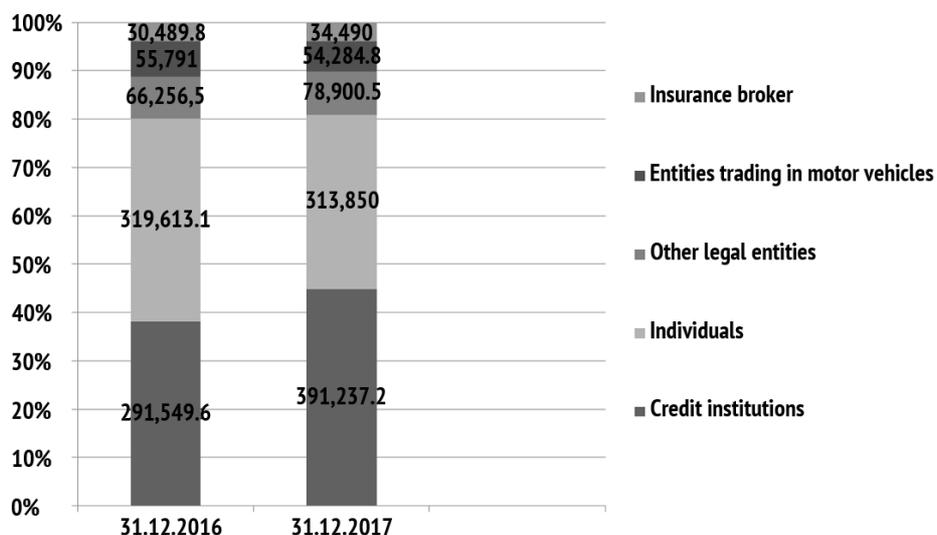
URL: https://www.cbr.ru/analytics/?PrtId=analytics_nfo (In Russ.)

Figure 1**Structure of insurance premiums by source, million RUB**

Source: Authoring based on the Central Bank of the Russian Federation data. URL: https://www.cbr.ru/analytics/?PrtId=analytics_nfo (In Russ.)

Figure 2

Structure of insurance premiums under insurance contracts concluded through intermediaries, by type of intermediary, million RUB



Source: Authoring based on the Central Bank of the Russian Federation data. URL: https://www.cbr.ru/analytics/?PrId=analytics_nfo (In Russ.)

Figure 3

Classification of bank risks in the bancassurance market

Bank risks in the bancassurance market					
Credit			Non-credit		
Loss of fees due to the borrower's cancellation of insurance policy during the cooling-off period	Insurance compensation lost due to bankruptcy or contractual disputes with the insurance company	Loss of fees as the borrower chooses the insurance company on his/her own discretion, other than those enlisted by the bank	Reputation risk		Income lost as the customer refuses to acquire the services
			Due to the customer's troubles with the insurance company recommended by the bank	Due to the sale of unnecessary services to the customers	

Source: Authoring

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Conflict-of-interest notification

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.

Translated Article[†]**REGIONAL BANKS & FINTECH: A STANDOFF OR PARTNERSHIP?****Tat'yana N. ZVER'KOVA**

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Available online 29 March 2019**JEL classification:** G12**Keywords:** regional bank, financial technology, FinTech**Abstract****Subject** The rise of innovative financial technology and blockchain intensified debates about refocusing the financial market's needs and FinTechs substituting traditional banks. The competition for clients moved to the digital level. Traditional banks are forecasted to step down gradually. Major banks announced changes in their business models to establish the partnership relations with fintech companies and surround themselves with the ecosystem of services. However, Russia has still been waiting for the technological boom. Considering limited financial resources, regional banks need to look for new aspects for cooperating with fintech companies.**Objectives** The research analyzed the existing situation in the banking market in terms of the competition of credit institutions with fintech companies. I study what opportunities regional banks have to reshape their business models and set partnership relations with fintech companies.**Methods** The research relies upon methods of expert assessment and generalization.**Results** Currently, regional banks have no financial resources and technological capabilities to compete with fintech companies. The cooperation strategy may help them survive in the situation.**Conclusions and Relevance** Regional banks should not stick to each aspect of FinTech development, but rather focus on the expansion and customization of the customer services, delivery of tailor-made solutions and recommendations through various communication means.

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The press has been discussing the importance and role of innovative financial technology in banking for the recent several years. At the end of 2017, explaining a new strategy for 2018–2020, German Gref, the Chairperson of the Management Board of Sberbank, stated that he had no vision of contemporary banks in the future. He also added that neither he nor his team would undertake to set up a new bank if they asked to¹. In his opinion, technological companies, which German

Gref actually considers as competitors, are in fact the beacon for Sberbank.

Does this view prevail in the market? I do some research and evaluate how FinTechs influence the position of regional banks and future development.

V. Solodkii² and A. Krivorotova³ justify the opinion stating that the Russian banks mainly transform into technological businesses holding banking licenses or strive to become ones after they endured the digital

[†]For the source article, please refer to: Зверькова Т.Н. Региональные банки и FinTech: противостояние или партнерство // Финансы и кредит. 2018. Т. 24. № 12. С. 2771–2782. URL: <https://doi.org/10.24891/fc.24.12.2771>

¹Eremina A. *Gref zayavil, chto ne verit v banki* [Gref says he does not believe in banks]. URL: <https://www.vedomosti.ru/finance/articles/2017/12/14/745310-gref> (In Russ.)

²Solodkii V. *Kak IT-industriya ubivaet banki* [How does IT sector kill banks?]. URL: <https://secretmag.ru/opinions/fintech-kills.htm> (In Russ.)

³Krivorotova A. *Bazel'skii komitet uvidel v fintekhe risk dlya bankov* [The Basel Committee considers FinTech as a risk for banks]. URL: <https://www.rbc.ru/finances/04/09/2017/59ad67f39a79477e3de93754> (In Russ.)

revolution. Currently, the world is seeing the largescale race of technologies vying for customers and subsequent intensification of the competition in the digital sector. It is common thinking that FinTech startups put banking businesses at stake.

P. Vigna, M.J. Casey [1], J. Rickards [2], M. Swan [3], S. Chishti, J. Barberis [4] and experts of Pricewaterhouse Coopers (PwC)⁴ believe that the market landscape will change and FinTechs will squeeze traditional banks out of the market within the coming 5 to 10 years.

According to PwC surveys, the overwhelming majority of respondents from the traditional sector of financial services do not have so dramatic expectations, predicting just an insignificant reduction in the scope of banking business, which may be overtaken by FinTech competitors.

According to Ernst & Young, Russia goes third in the FinTech services market among 20 major markets of the world. Market Penetration index of FinTech services in the Russian largest cities has been constantly growing, reaching 43 percent in 2017 and actually reshaping the existing ecosystem⁵.

Under such circumstances, the Central Bank of Russia could but attempted to create the so called regulatory playground where innovative financial technology and services could be tested in order to forge a mechanism for streamlining the development of innovative financial technology and services, preserving the stability of the financial system and protecting consumer rights.

The above opinions, including the Basel Committee for Banking Supervision⁶, about a vigorous rash of changes, tough competition and danger of FinTechs seem rather apocalyptic for banks and the contemporary financial sector. If such predictions say nothing about major banks in the market, what should we think about medium-sized and smaller regional banks, which are not armored with substantial financial and IT resources.

However, there are opposite views. As V. Solodkii fairly notes⁷, Russia has not yet experienced the FinTech boom. According to research done by N.I. Morozko [5], S. Pertseva, D. Kopylov [6], A.A. Bakhareva [7], N.I. Kulikov. Yu.V. Kudryavtseva⁸, V.V. Maslennikov, M.A. Fedotova, A.N. Sorokin [8], it would be fair to point out only several breakthrough startups, which virtually work as advertising platforms and search for investors. We still cannot indicate which national financial technology allowed to turn around the consumption of financial services and behavioral patterns of customers.

EY experts believe that traditional banks have big opportunities and stay calm to an extent⁹.

The same tendency is noted by PwC stating that the Russian companies have nothing to worry about so far. According to PwC survey, the Russian respondents have less concerns about the impact that the FinTech sector may possibly have on their businesses. The Russian companies mention new approaches to taking risks and forecasting losses as one of the most important effects financial technology may have. I should also admit that the Russian companies see fewer opportunities of FinTech for the effective use of the existing data and analytics.

In such circumstances, regional banks also take efforts to integrate high technology into services they deliver to customers. However, any successful and significant projects can hardly be seen.

In my opinion, J.F. Sinkey made a good guess of regional banks' failure:

- the inability to satisfy financial needs of the baby boom generation;
- the regulatory burden that causes disparities in the market, which would be more favorable for market actors, other than banks;
- shortage of funds to acquire expensive technology needed to win the competition race;

⁴ Blurred Lines: How FinTech is Shaping Financial Services. Global FinTech Report. PwC, March 2016. URL: <https://www.pwc.ru/en/banking/publications/fintech-global-report-eng.pdf>

⁵ *FinTech v Rossii i mire: trendy, infrastruktura, uchastniki rynka* [FinTech in Russia and worldwide: Trends, infrastructure, market actors]. URL: <http://2017.russianinternetforum.ru/news/1288/> (In Russ.)

⁶ Krivorotova A. *Bazel'skii komitet uvidel v fintekhe risk dlya bankov* [The Basel Committee considers FinTech as a risk for banks]. URL: <https://www.rbc.ru/finances/04/09/2017/59ad67f39a79477e3de93754> (In Russ.)

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⁸ Kulikov N.I., Kudryavtseva Yu.V. [Banks are moving to Internet banking]. *Finansy i kredit = Finance and Credit*, 2016, no. 29, pp. 2–10. (In Russ.)

⁹ *Itogovyi dokument Forumu innovatsionnykh finansovykh tekhnologii Finopolis 2016* [White paper of the Forum for Innovative Financial Technology Finopolis 2016]. URL: <https://finopolis.ru/program/totalDocumentForumFinnopolis2016.pdf?1524511048> (In Russ.)

- dissemination of financial innovation (securitization) and development of secondary markets, which would make banking look like a commodity-based business [9].

I should also mention those who advocate the close cooperation and mutual penetration.

According to A. Gots¹⁰, banks and FinTechs are not competitors in the Russian market since they target at different customers. While banks work with the mass market segment, FinTechs offer a specialty service of high quality at a higher price.

As E. Timko says¹¹, there is no competition of banks and FinTechs in Russia and it will not arise. There are several successful FinTech startups which just fit in their niches and unique model, which banks cannot implement due to certain reasons. However, any considerable competition is out of question. There exist a group of startups operating in the b2b segment and offering their products to banks. According to V.D. Milovidov [10–12], S.Yu. Pertseva [13], FinTechs have not yet managed to pushed banks from their market niche.

Nowadays, banks do not have to compete with FinTechs, but rather adopt to rapidly changing market conditions and choose the cooperation path. Possible options range from purchasing FinTechs at a high price to setting up viable technological partnerships.

As a matter of fact, major banks will acquire teams and their technology or have to concede, letting them be nominally free and independent and acting as co-investors of such projects.

S.Yu. Pertseva [13], A.M. Pogosyan [14], N.E. Dorokhin [15], V.M. Usoskin, V.Yu. Belousova, I.O. Kozyr' [16] spotlight two strategies of banks. First, they acquire operational FinTech projects. Second, they bring u such startups internally. Actually, both scenarios are quite expensive and hardly predictable. They are likely to leave regional banks with small capital out of innovation and technological retrofit of their business.

What remains overlooked is that FinTechs virtually can have significant impact on five aspects, i.e. money transfers and online payment, financial planning, savings and investment, borrowings, and insurance.

¹⁰ Gots A. *Banki vs fintekh: ugroza, otkuda ne zhdali* [Banks vs FinTech: Threats Unexpected]. URL: <http://bankir.ru/publikacii/20180122/banki-vs-fintekh-ugroza-otkuda-ne-zhdali-10009406/> (In Russ.)

¹¹ Timko E. *Banki dognali startapy* [Banks caught up with startups]. URL: <https://www.vedomosti.ru/opinion/articles/2017/04/19/686319-banki-dognali> (In Russ.)

However, in reality, the segments are not crucial for regional banks.

Therefore, considering the above conflicting opinions, I point out issues that had a considerable impact on regional banks as part of their partnership relations with FinTechs (*Fig. 1*).

V.D. Milovidov [12], V.M. Usoskin, V.Yu. Belousova, I.O. Kozyr' [16], T.V. Nikitina, M.A. Nikitin, M.A. Gal'per [17], G.F. Ruchkina [18] predict the survival of few banks. In the best case scenario, there will be about 200 banks in Russia, including 10–20 major State-owned ones united by the common strategy and commitments. The other banks will serve as a kind of in-house credit institution services a specific large enterprise or city, rather than mass retail customers. Large banks will pick up the pace of buying successful FinTech projects, expanding their portfolio of products and services. Later on they will be developing innovative laboratories.

Most specialists hold that it is almost a reality but still in the future. Currently, regional banks have some time due to financial difficulties, small financial market in Russia, drop in the purchasing power and toughening governmental control. According to T.V. Nikitina, M.A. Nikitin, M.A. Gal'per [17], G.F. Ruchkina [18], in Russia, some services have not been properly developed yet, demonstrating the low demand. In Russia, b2b websites are usually used by macrofinance institutions offering loans at much higher rates than banks. The mobile acquiring market is very narrow.

In my opinion, in such circumstances, as FinTechs grow stronger as competitors, regional banks should consider their limited financial resources and adjust their business models so as to organize the partnership relations with FinTechs and create the surrounding ecosystem of services, follow strategies proposed by J.F. Sinkey [9] and suggestions of PwC and EY¹². In the context of regional banks, they provide the following recommendations.

1. *Investing in niches*. Being hardly comparable with State-owned banks, regional banks should stream their funds and resources to practices where they

¹² Blurred Lines: How FinTech is Shaping Financial Services. Global FinTech Report. PwC, March 2016. URL: <https://www.pwc.ru/en/banking/publications/fintech-global-report-eng.pdf>

EY FinTech Adoption Index – Russia. Key Trends. 2016. URL: [https://www.ey.com/Publication/vwLUAssets/EY-fintech-index-russia-eng/\\$FILE/EY-fintech-index-russia-eng.pdf](https://www.ey.com/Publication/vwLUAssets/EY-fintech-index-russia-eng/$FILE/EY-fintech-index-russia-eng.pdf)

are likely to have a competitive advantage. Such niches usually include VIP banking services for the wealthiest people of the region, data processing.

2. *Sourcing out functions as much as possible.* Regional banks may contract out big data processing. Any risks of data processing on an outsourcing basis may be offset if the data are divided among several providers of cutting-edge blockchain technology.
3. *Positioning the small size as an advantage.* Admittedly, some brand new technologies flourish most of all in small regional banks, with their size becoming their strength. Smaller banks may outperform larger ones by identifying real needs of their customers, rather than the generic and robotic servicing style. It is vexing to hear welcoming greetings of automated voice response, never ending ads and menu options.
4. *Applying for services of online application providers.* Such providers open access to brand new Internet technologies and services to regional banks at a certain price. Actively adopting e-commerce technologies, online applications of banks help estimate loans, provide loans to small entities, handle mortgage transactions, etc.
5. *Developing the inner capability for integration.* Regional banks have to deal with diverse systems and partners. Banks need their own high professional IT-teams, which would integrate systems and processes, especially databases, networks and web applications.
6. *Avoiding the extreme thriftiness in key aspects.* If the bank's management clearly understands that new technology allows to identify competitors, they should not tighten the purse strings for the talent who would be capable of activating the innovation. Historically, the personnel, who have no appropriate skills and are unsatisfied with the management, may ruin strengths of the best ever technological innovation. Furthermore, undervalued specialists may leave for competitors and offer their skills there.
7. *Revisiting decisions.* It is necessary to *think FinTech*. New formats of cooperation, such as partnership and joint venture, should be tested. For that, priority and promising lines should be determined, defining incentives for attractive professionals who have sufficient business skills.
8. *Partnership as the single method for banks to cooperate with FinTechs.* Partnership-based cooperation constitutes a simple and flexible way to establish the relationship with a technological company and effectively use its capabilities in the safe environment for testing. Traditional market actors will strengthen their competitiveness, implement their decisions and launch their products to the market within a shorter period of time through the partnership with FinTechs. If FinTechs act as providers of services, their ideas and processes can be adopted and borrowed.
9. *Creating an agile business.* FinTechs work rapidly, correct their mistakes quickly and take risks without hesitation. Banks should consider whether the dynamism fits their business processes and to what extent it meets shareholders' expectations.
10. *Creating the conditions.* Banks should reinforce the positions through active involvement into the sector processes and launch venture projects, business incubators and programs for acceleration.
11. *Encouraging and Supporting Innovation.* Banks should master the development of innovation and attract high-profile talent who combine relevant technological knowledge and sales skills. Thus, they should revise their manner of management, decline the traditional top-to-bottom approach and adopt the innovation-oriented model.
12. *Building the positive brand for employment.* Banks should liaison with startups and build corporate brands with the technologically-oriented philosophy.
13. *Reshaping the HR development system.* To prepare the training programs for mastering new programming knowledge or other skills relating to digital technologies, it is necessary to create opportunities for employees to unite into *networks* locally so that they could sort out new trends and learn new technology;
14. *Digitizing the work space.* To hire the young talent, banks should interact with their employees in another way. They should revise professional promotion mechanisms, implement a set of incentives or contract out some workload to freelancers.

The proposed guidelines will unavoidably make banks ensure the protection of their niches using new technology and providers.

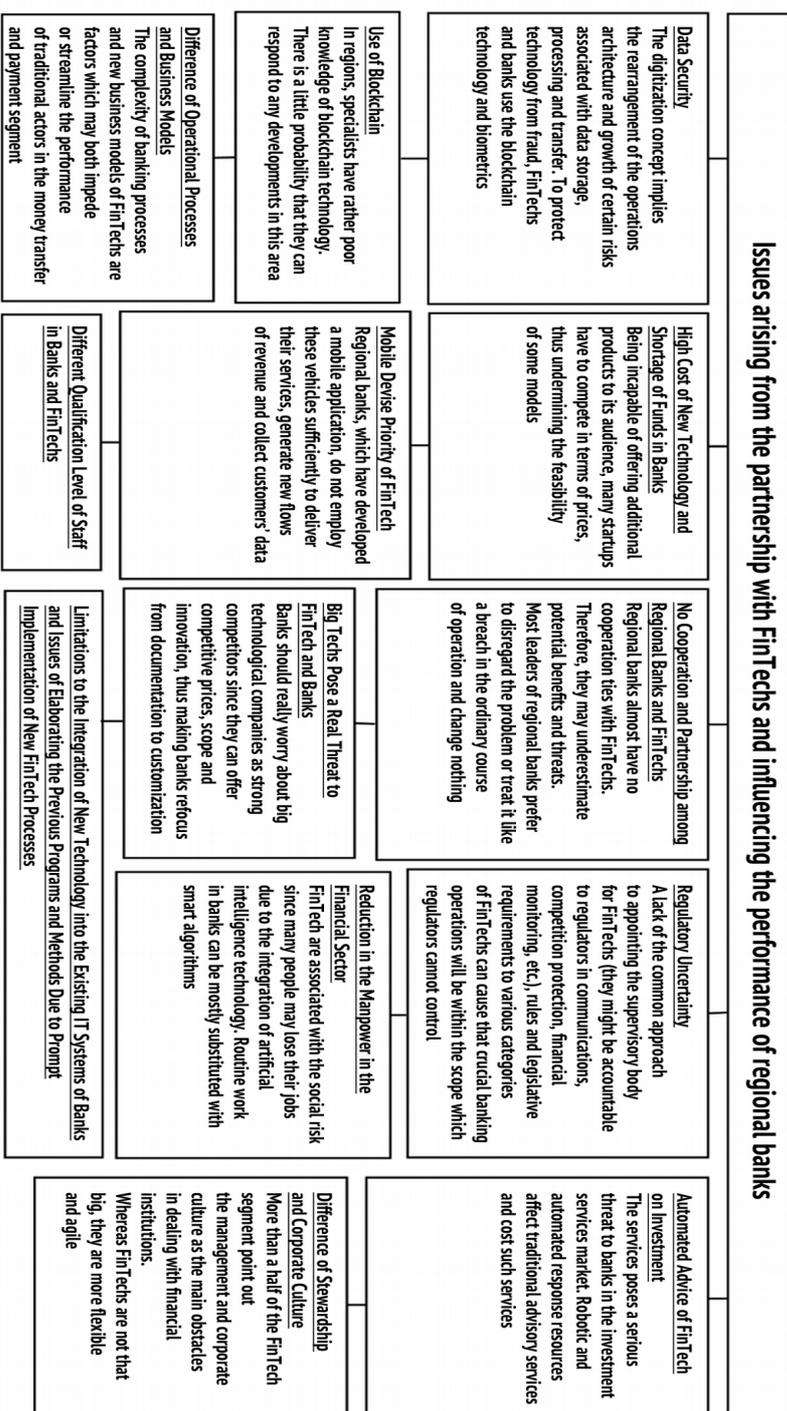
Under the current circumstances, regional banks can but speed up. As PwC predicts, the speed, security and digitization will become cornerstones of the payment ecosystem.

Regional banks are now in a kind of trap seeing that their market share are taken over not only by State-owned banks but also FinTechs. What may mainly result from the FinTech segment development is the huge number of new business models in the sector of financial services. According to PwC, the new business model standard requires to decline the linear strategy for product promotion and opt for the customer-oriented model. As part of the new model, providers of financial services act as intermediaries, thus allowing

customer to get advice and interact with all parties of the process via various channels. Hence FinTechs intensify the focus on customers and prioritize it in the context of their business model.

In my opinion, it would be sensible to look back at ideas of Hans-Ulrich Doerig calling to provide customers not reasonable and sound recommendations, rather than banking products, so that they could make decisions on all financial issues they have [19]. It is obvious that banks actually fail to render so consistent, independent, unbiased and quality advisory services, which customer expect to get. Regional banks should necessarily strive to improve and customize customer services.

Figure 1
Issues arising from the partnership with FinTechs and influencing the performance of regional banks



Source: Blurred Lines: How FinTech is Shaping Financial Services. Global FinTech Report. PwC, March 2016. URL: <https://www.pwc.ru/en/banking/publications/fin-tech-global-report-eng.pdf>
 EV FinTech Adoption Index – Russia Key Trends. 2016. URL: [https://www.ey.com/Publication/vwLUAssets/EV-fintech-index-russia-eng/\\$FILE/EV-fintech-index-russia-eng.pdf](https://www.ey.com/Publication/vwLUAssets/EV-fintech-index-russia-eng/$FILE/EV-fintech-index-russia-eng.pdf)

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Conflict-of-interest notification

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Translated Article[†]

THE USE OF ECONOMETRIC TOOLS FOR COST MANAGEMENT ANALYSIS



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Abstract

Subject The article analyzes the cost management cycle, being a determinant of the economic result embodies in profit and better competitiveness.

Objectives Using econometric tools, we conduct an extended analysis of the cost management process by modifying and implementing components of the financial position specification technique and segregating conditionally fixed and conditionally variable costs from total costs of an entity as an element of its external environment.

Methods We relied upon financial documents of the entity producing consumer goods of limited diversity, framework of multiple regression and the financial position specification technique.

Results Having adjusted the initial technique for the specifics of the analyzable issue, we managed to expand the scope of the tools and proposed what aspects of the model should be developed so to streamline the departure from the traditional classification of economic processes into micro-, meso- and macrolevels. We analyzed the correlation of production output by brand, general fixed costs, variable costs per product unit and performance results through the break-even analysis so to make precise measurements of conditionally fixed and conditionally variable costs. The analysis revealed that the entity's operations will remain breakeven within five years to come. Making the substantive interpretation of causes and consequences of the proposed transformations and values, we take the specifics of each item into consideration, adjust tools and make assumptions for further specification in accordance with a life cycle stage, external environment, regional and macroeconomic trends, etc.

Conclusions and Relevance As the computations show, costs can be segregated, with modern information and computing tools being able to ensure not only an operational and practicable algorithm, but also the sufficient quality of analytical finding, which would allow to make and implement further managerial decisions.

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Introduction

As the analysis of the existing socio-economic processes shows, new conditions induce the transformation of customary relationships. Although the economic phenomenon of costs has been extensively covered in the literature, being of very practical nature, it actually implies very complex relationships and terminological collisions. The terminological string cost – costs – expenditures is interpreted with methodological discrepancies, thus influencing the monitoring of respective indicators, financial result formation approaches and their recognition in financial statements.

In the Russian practice of management accounting, the above terms are applicable, though they are not synonyms. There is no unanimous opinion which of them (cost, costs or expenditures) has the broadest meaning. Therefore, terminological discrepancies distort the analysis of the respective item.

As part of the general approach, costs are systematized by purpose and objective of economic analysis, type, element, article, agent, accrual methods, cost centers, etc.

Cost of products is a comprehensive resultant metric indicating the use of corporate resources and other aspects of its financial and economic performance. Therefore, it is important to analyze the conditions for costing and effect of various factors¹ to evaluate the corporate position. In the contemporary economic theories and practices, the cost of product means current costs incurred by the entity in the monetary form for direct operational functions, i.e. production and distribution [1]. The cost is a subset of the cost management set in relation to a respective business entity. The cost is mainly managed so as to create the cost management system², which requires in the more and more unpredictable environment to comply

with management principles for the correlation of resources, costs, goals and results.

Direct costing (marginal costing, variable costing³) turns up to be one of the most precise approaches to measuring the cost. A lot of researches focus on this approach to study its role in managerial decision making concerning the product mix, production volume, breakeven point, pricing, marketing strategy at different phases of the corporate life cycle.

The above system requires to account for costs classified into direct (immediately incurred to manufacture a production unit) and indirect, which are allocated by type of products through a certain technique (in the case of an entity making more than one type of products) and attributed to financial result [2].

The methodological framework of the so called direct costing system is the segregation of all costs, which is understood with a certain approximation, into variable *VC* (production and non-production depending on business performance, including changes in production output and uneven dynamics⁴, and fixed *FC*, that do not depend on the production output (or depend insignificantly)⁵. Mostly, direct costs are variable, while indirect ones can be both variable and fixed.

In the case of most managerial decisions, it is the variable element of the cost⁶ of production out that is important to know, i.e. $Cost \equiv TVC$, where *TVC* stands for Total Variable Costs, or general variable costs. The fact that the cost measurement requires a permanent component to be included is a disputable issue, which helps understand the full cost of finished products or construction in progress (CIP), valuation of inventories, etc. However, this entails risks of ineffective control and subsequent distortion of results (for example, profitability, etc.).

¹For the source article, please refer to: *Пахомов А.В., Пахомова Е.А., Рожкова О.В.* Применение эконометрического инструментария для анализа процесса управления затратами // Экономический анализ: теория и практика. 2018. Т. 17. № 12. С. 1459–1477. URL: <https://doi.org/10.24891/ea.17.12.1459>

¹Rozhkova O.V., Franstuzova E.V. [Factor analysis for the evaluation of corporate financial-economic analysis]. *Sbornik nauchnykh trudov S'world*, 2017, vol. 4, no. 46, pp. 16–20. (In Russ.)

²Chernysheva Yu.G., Kochergin A.L. *Kompleksnyi ekonomicheskii analiz khozyaistvennoi deyatel'nosti* [Comprehensive economic analysis of business operations]. Roston-on-Don, Feniks Publ., 2007, 443 p.

³Brown G. Introduction to Costs Accounting: Methods and Techniques. URL: <http://www.globusz.com/ebooks/Costing>

⁴*Ekonomicheskaya teoriya* [Economic theory]. Ed. by A.I. Arkhipov, S.S. Il'ina. Moscow, Velbi, Prospekt Publ., 2010, 608 p.

⁵Kerimov V.E. *Uchet zatrat, kal'kulirovanie i byudzhetrovanie v otdel'nykh otraslyakh proizvodstvennoi sfery* [Cost accounting, costing and budgeting in certain manufacturing sectors]. Moscow, Dashkov i K Publ., 2008, 476 p.

⁶Scone T. *Upravlencheskii uchet: kak ego ispol'zovat' dlya kontrolya biznesa* [Management Accounting]. Moscow, Audit, YUNITI Publ., 1997, 179 p.

The Method for Analytical Segregation of Conditionally Fixed and Conditionally Variable Costs and Its Modification

Measuring the percentage of indirect costs in total corporate costs is the most difficult part of the practical segregation of conditionally fixed and conditionally variable costs in total costs. However, an analytical chart of approximated linear dependency of the cost on production output [3], which is an option to model economic dependencies through linear equations for analysis and forecasting, helps attribute then to a certain type of activity or product, adjust the production output and amend pricing policy.

The method consists in the following steps:

- plotting the cost to show the dependency on the core production volume;
- setting the linear trend of the cost;
- formulating the trend line equation as a line $y = a + bx$ and segregation of conditionally fixed and conditionally variable costs b ;
- analyzing the results, segregation of variable components making the cost of products.

We analyze an entity which is one of the largest manufacturers of industrial rubber products in Russia and the CIS and a long-standing strategic partner of the leading enterprises operating in defense, mining, coal production, transport, food production, machine building, metallurgy and agriculture.

Consider using the proposed method (or the need to modify it) in an entity from another industry (consumer products, namely makeup manufacturing). Despite the recent geopolitical and economic developments, the consumer demand for new cosmetic products continues to increase, though being slower, but cosmetic brands keep their development trend, thus making the Russian cosmetic market one of the most attractive and rapidly growing ones worldwide. Multinationals still remain the leaders in the industry, with about ten companies holding 80 percent of the market, though all the segments feature not only foreign, but also the Russian manufacturers⁷.

The analyzable entity herein has the following characteristics:

⁷ Overview of Russia's cosmetics market.

URL: <https://adindex.ru/specprojects/markets3/cosmetics-1.phtml> (In Russ.)

- new independent industrial enterprise operating as part of the existing corporate system and taking over the production of items which were previously manufactured by third party companies, including foreign ones, on a contractual basis;
- substantial investment;
- involvement of resources from almost all functional areas of the enterprise initiating the project (marketing, finance, logistics, etc.);
- ensuring the overall business compliance with the international financial reporting standards and subsequent certification of the quality management system under GOST R ISO 9000.

First, there is a considerable difference between total costs and cost when an innovative product or service is created and launched. Second, such projects are often innovative from different viewpoints since innovations reshape the governance mechanism and competitiveness area⁸. Such an enterprise mainly strives for import substitution, i.e. alleviating the dependence of the product on foreign manufacturers and reducing the production and logistic leverage, thus boosting the competitiveness.

Our reasoning is based on the following steps.

Step 1. At Step 1, we determine the composition, characteristics and statistical values of relevant economic variables for a five years' period: two trademarks TM_1 and TM_2 and production output respectively Q_1 and Q_2 , with total production output Q ; the list of fixed costs FC by item; general variable costs for $TM_1 - TVC_1$ and for $TM_2 - TVC_2$, and total variable costs TVC and variable costs per product unit VC .

The analysis of variables was guided by the following assumptions:

- parameters are viewed as constant values (though all costs tend to increase in the long run);
- demand for such products rises, with structural market development missing;
- product mix and selling price are permanent;
- production volume is kept within a relevant range, being the only factor influencing production costs;

⁸ Pakhomova E.A., Rozhkova O.V. [Product line planning aspects as part of the corporate planning system]. *Strategicheskoe planirovanie i razvitie predpriyatii. T. 3: materialy XVII Vserossiiskogo simpoziuma* [Proc. Sci. Conf. Strategic Planning and Development of Enterprises. Vol. 3]. Moscow, CEMI RAS Publ., 2016, pp. 126–129. (In Russ.)

- production output and sales as of the beginning and end of the analyzable period depend on sales of the project initiating company's product, being the only factor influencing expenses and income;
- financial, human resources and production capacities are strictly stipulated, limited, being unchangeable;
- credit, fiscal and other factors are not considered.

Step 2. We formalize input data to comply with the economic theory⁹:

$$TC = FC + VC \cdot Q,$$

where TC is total costs of an entity;

FC is fixed costs;

VC is variable costs per product unit;

Q is production output.

Relying upon input data (business plan for business incorporation, budgeted income and expenses, statement of profit and loss, balance sheet, estimated and reported cost of products), we compute variable costs per product unit for TM_1 and TM_2 via MS Excel spreadsheet:

$$VC_1 = \frac{TVC_1}{Q_1} \quad \text{and} \quad VC_2 = \frac{TVC_2}{Q_2} .$$

The most intensive controversy arose around the assumption that, according to the input data, in the first year of corporate operations, variable costs per product unit depend on the production output in the short run, i.e. $VC = VC(Q)$, while total variable costs TVC per product unit should remain unchanged. This may possibly be due to the specifics of the task. During the start-up phase and testing of production launch conditions, commissioning work, production output adjustment, the entity often changes suppliers, thus causing alterations in the cost, standards and characteristics of raw materials and suppliers, etc.

We measure FC and TC per each TM by apportionment. Therefore,

$$FC_1 = \frac{Q_1}{Q_1 + Q_2} FC ;$$

$$FC_2 = \frac{Q_2}{Q_1 + Q_2} FC ;$$

⁹ Palamarchuk A.S. [Assessment and rationale for managerial decisions]. *Spravochnik ekonomista = Economist's Guide*, 2012, no. 5, pp. 40–51. (In Russ.)

$$TC_1 = \frac{Q_1}{Q_1 + Q_2} TC ;$$

$$TC_2 = \frac{Q_2}{Q_1 + Q_2} TC .$$

Step 3. We express the revealed relationship mathematically and formulate the boundaries of the model. All values of the economic-mathematical models represent both variables and independent parameters [4]. We equate them with certain performance indicators and particular figures. Afterwards we identify whether there is a functional dependency among general variable costs (dependent variable) TVC and production output as for general Q and Q_1 , Q_2 in particular (independent variables):

$$TVC = TVC(Q);$$

$$TVC_1 = TVC_1(Q_1);$$

$$TVC_2 = TVC_2(Q_2).$$

To make the regression equation with meaningful coefficients and estimates, we follow step-by-step methods for correlation and regression analysis and STATISTICS software application.

Please refer to the research indicated herein [5] for information about using econometric methods to verify socio-economic relationships and probability of mutual effect by evaluating the elasticity. In this case, we confine ourselves to the given equations:

$$TVC = -52,549.8 + 0.7 Q;$$

$$TVC_1 = -4,210.82 - 1.11 Q_1;$$

$$TVC_2 = -56,914.6 + 0.7 Q_2.$$

The above computations allow us to conclude that the a -offset is negative. However, the coefficient provides a predicably y if $x = 0$ (in case of the given equations if production output is zero) and shall be interpreted only if it has meaningful economic substance. If the absolute term of equation a is negative, it may mean that the domain of y does not include zero value of x and approximate values. Although it is possible to assess the minimum value of factor x , which would ensure the lowest positive value of y ¹⁰, it appears to be impossible to verify statistical hypotheses with respect to all values of variables in the population and identify all random components influencing independent variable y . In the situation, the value of explanatory variable x on the

¹⁰ Eliseeva I.I., Yuzbashev M.M. *Obshchaya teoriya statistiki* [General theory of statistics]. Moscow, Finansy i Statistika Publ., 2004, 656 p.

sample is far from zero. Hence, the exclusion of the negative fixed term will distort the assessment and result in the incorrect t -test.

The equations also constitute an interim step of the analysis and provide an analytical description of available economic data within the given range of parameters. Hence the fact that the regression coefficient is not zero is important, rather than its sign. The correlation of analyzable indicators as determination coefficient R^2 ranging within 0.9778 to 0.9905 matters in evaluating the independence. This means that the variance of factor attributes¹¹ prevail as compared with the rest factors, which the model does not accommodate to, influencing the resultant indicator. In all the three equations, there is a strong functional and statistically meaningful correlation of the indicators under a 99-percent confidence level. As per F -test, the equations are also reliable.

The same approach works to identify the existence of a functional correlation of total variable costs (dependent variables) TVC and production output (independent variable) with respect to certain brands Q_1 , Q_2 . We detected the positive correlation of TVC and production output $TM_2(Q_2)$, while the negative correlation is captured in the case of TVC and production output $TM_1(Q_1)$. This may be due to an insignificant share of the brand in total production output (from 5 to 7 percent within the span of four yeas and subsequent phaseout). Presented graphically, the correlation of TVC and Q_1 approximates 0, thus debunking the hypothesis of $TVC = TVC(Q_1)$

Step 4. Considering the data obtained at Step 2 and functional correlation identified at Step 3, we specify the equation $y = a + bx$ in terms of total costs TC and find conditionally fixed costs a and conditionally variable costs b . Whereas $TVC_1 = TVC_1(Q_1)$, but $TVC \neq TVC(Q_1)$, and $TVC_2 = TVC_2(Q_2)$ and $TVC = TVC(Q_2)$, then we use the formulas $TC_1 = \frac{Q_1}{Q_1 + Q_2} TC$ and (like TC_2) figure out that the result of regression equations concerning conditionally fixed costs a is assigned an incorrect sign in terms of economic theory. Therefore, such a regression equation cannot, as a rule, be of genuine sense and should be analyzed and adjusted.

¹¹ Aivazyan S.A., Mkhitarayan V.S. *Teoriya veroyatnostei i prikladnaya statistika. T. 1* [Probability theory and applied statistics. Vol. 1]. Moscow, YUNITI Dana Publ., 2004, 656 p.

Taking a more detailed view of the above equations, we arrive at $\frac{Q_1}{Q_1 + Q_2} TC = a + a_1 Q_1 + b_1 Q_1^2$ (likewise for Q_2 and Q), which corresponds with the following equation $y = a + bx + cx^2$.

Step 5. We evaluate the resultant regressions, check the model for adequacy, clerical accuracy and compliance with the existing economic phenomena. To begin with, we compare the result of Step 4 in equations like $y = a + bx$ with input data. As for the dependency of TC on Q , the equation is expressed as $TC = -41,158.9 + 0.7Q$ provided the determination coefficient is 0.9896, thus evidencing the high quality of regression in general. The statistical significance of the determination coefficient is corroborated with the correspondingly high F -test. Hence the regression equation includes at least one explanatory variable, which is proved with high t -test of the coefficients¹².

As for conditionally fixed costs (-41,158.9 and 36,944) and conditionally variable costs (0.7 and 0.5), results insignificantly differ from input data. Therefore, the given significance level allows to use the equation with the computed coefficients, but also adjust so as to get an adequate and more accurate result, since the coefficient considerably depend on the scale rule gauging the variables. A similar decision was make concerning TM_2 , while the coefficients may not be improved in the case of TM_1 , since it accounts for a small share in total volume. We assume that the negative sign of coefficient a can be economically interpreted as an impact of those fixed expenses incurred during several months preceding the production launch. Statistically, it can be construed as the inclusion of negative figured into the confidence interval. In the mean time, the expenses are so insignificant to cause the exclusion of the absolute term.

In all equations expressed as $y = a + bx + cx^2$ and having correct signs in terms of the economic theory, there is a positive correlation of three indicators (TC_i , Q_i and Q_i^2). In particular, the regression equation is expressed as follows for the same indicators TC and Q :

$$TC = 11,515.74 + 0.43 Q + 4.01 \cdot 10^{-7} Q_2,$$

with the determination coefficient R^2 equaling 0.9936, and the coefficient value $4.01 \cdot 10^{-7}$ is insignificant.

¹² Borodich S.A. *Ekonometrika* [Econometrics]. Minsk, Novoe znanie Publ., 2001, 408 p.

Having checked the accuracy of the regression analysis, we concluded that there are statistical grounds to consider the resultant equation satisfactory and appropriate for purposes of forecasting and analysis and qualify the results as sufficiently reliable.

Comparing the resultant conditionally variable costs (0.43) and conditionally fixed costs (11,515.74) with input data (0.5 and 13,918 respectively), we state that the equation is not only correctly expressed, but its results also almost meet the given conditions. Hence, using the quadratic terms, we build equations with statistical characteristics and economic substance excelling the previous ones.

This may be due to the fact that the inclusion of regression generally improves the model because any new attribute makes it more informative, contributing to the variance of the dependent variable. Moreover, this often stems from the economic reasonableness of including closely related factors. However, the close relation of explanatory variables may prevent the graphic presentation and cause the multicollinearity and more complicated selection of the best regression equation¹³.

Step 6. We substantiate aspects for further improvement of the model and its information and mathematical framework. The step reveals the dynamic substance of the regression analysis. Let us reassume the verification of an alternative hypothesis stating that the cost is not equal to TVC , i.e. exceeding TVC . Regression equations like $y = a + bx$, where $x = TVC_i$ are expressed as follows for TM_1 and TM_2 :

$$Cost_1 = 7,726.39 + 3.04 TVC_1;$$

$$Cost_2 = 544,258.29 + 12.16 TVC_2.$$

Whereas Total Variable Costs $TVC_i = (Cost_i - a_i) / b_i$, variable costs per product unit VC_i can be measured with the formula, such as

$$VC_i = TVC_i / Q_i = [(Cost_i - a_i) / b_i] / Q_i.$$

Signs of the regression coefficients are correct in terms of substance. The determination coefficient R_2 amounted to 0.99 and 0.78 respectively, signifying the strong and moderate correlation when the significance level is below 1 percent and the significance of the parameters is at least 5–7 percent.

¹³ *Ekonometrika* [Econometrics]. Ed. by V.S. Mkhitarian. Moscow, Prospekt Publ., 2011, 384 p.

Therefore, such verification helps identify those parameters, which should be specified within certain numerical boundaries [6], and reduce computational steps with respect to a specific equation. Varying the values deliberately and evaluating them at each step makes quite an arduous process, but it ultimately allows to choose the best-fit one, thus improving the model mathematically. If the time factor is taken into consideration, such tasks require to simply divide the entire time interval $[t_0, T]$ and solve a number of tasks for each step $(t + 1)$, which is out of the scope of this research.

The technique seems suitable because it helps choose the right step to evaluate the model's parameters at each step of the analysis. For example, measured through apportionment at Step 2, indicators of fixed costs FC can be viewed by selecting an appropriate step ΔQ :

$$FC_1' = \frac{Q_1 - \Delta Q}{Q_1 + Q_2} FC ;$$

$$FC_2' = \frac{Q_2 - \Delta Q}{Q_1 + Q_2} FC .$$

The steps described herein and previously can be outlined in *Fig. 1*.

It is quite logical and reasonable to economically develop the model in order to find the break-even point and measure the operational leverage, since it requires to analyze the dependence of performance results (products or certain type of products, trademark) on sales, production and costs [7], which are studied herein as fixed and variable categories. Making estimates for the coming five years, we suppose that the entity will remain break-even.

It is noteworthy that the varying calculus streamlines the analysis and forecast of changes in a bunch of indicators not only for purposes of the corporate internal policies at different stages of its life cycle, equalizing the profitability and risk, but also for comparing its market position, alleviating the impact of the negative market environment, and industry-specific benchmarking. Assuming that total costs equal, risks are lower (that is, business is more sustainable) if variable costs exceed fixed ones.

Step 7. Analysis of results and their application. At the final step of the modeling cycle, it is necessary to evaluate not only the correctness and completeness of results from perspectives of the economic theory, but

also interpret them in terms of substance with respect to a real-life object, which is to be described with the invented model, and provide hands-on recommendations.

Results of each cycle are valuable *per se*. However, if they are viewed through new conditions and specified through functional dependencies, first, they will help rectify the model's drawbacks at the following steps (including a choice of a more appropriate mathematical framework and avoidance of inherent methodological errors). Second, they spotlight new areas for research into objects, environments, projects and processes, being the most conspicuous and high-profile aspects of economic phenomena and systems and actually representing all their possible types [8].

The well elaborated model can be used to reveal the correlation and internal mechanisms of processes under study. If the product mix is scarce, the task does not require special models, high qualification of specialists, being quite applicable to goods of stable demand. When the entity offers a wide array of products, for example, operating in the consumer goods market, econometric methods should become a reasonable and effective step. For example, mathematical statistics, linear and nonlinear programming, games theory, etc. However, what complicates the modeling is the collection of relevant, sufficient and appropriate information [9]. Hence it is worth mentioning that better and more precise planning may boost some costs, raising the issue of marginal utility of doing so and ultimately cost effectiveness (*Fig. 2*).

Fig. 3 depicts the cyclical nature of such research, moving from the economic theory and business practice to econometric modeling, analysis of internal and external processes and, consequently, suggestions on the improvement of the theory and economic policy.

As for the microlevel, such a cyclical model can be quite precisely described and convenient because it gives a concise view of the data, to the advantage of descriptive models [10]. Descriptive models serve for managing a process, without requiring to study its mechanism.

However, considering an entity as part of its external surroundings, the cycle can be examined in close connection to structural modifications of upper-level socio-economic systems, thus enriching the traditional knowledge of economic hierarchical systems (*Fig. 4*) and creating new subjects for scientific analysis.

The approach involves several models, which we have built, reflects a correlation of indicators over time and describes cooperation aspects as part of real economic processes.

Transformability of Microdescriptions into Macromodels

Macro-, meso- and microeconomic levels are connected by economic elements viewed in terms of their group interactions. Thus, the most important function is to set up mechanisms for managing the agents at different hierarchical levels (microlevel of certain entities; mesolevel that is interim and intended for groups to unite economic regions; macrolevel including the nation and society as a whole [11]) by assessing functional parameters through economic-mathematical modeling [12]. Such units are mainly formed to implement their competence on the basis of measurable results (at the corporate level, the innovative production is meant *inter alia*) and seize opportunities of the integration through the cost reduction [13]. It is one of the most important objectives of most Russian enterprises. Costs increase as raw materials and supplies appreciate and tariffs, interest rates and so on are raised. Whereas there is no effective technique of goal achievement, provided the entity uses resources reasonably and responsibly, the formation of integral and coherent economic systems, which drive the intensive reproduction and development in the long-run, lags, notwithstanding any adverse effects that may arise.

The analysis of supply and demand, product mix planning, cost management and other measures for detecting what influences the pricing [14] as one of the competitiveness drivers become the background for joint projects (*Fig. 5*) and implementation of the national strategic initiative specifically as part of the mesoeconomic space [15], which unite local and industrial management, sets regional and macroeconomic trends needed for spurring the economic growth.

The models and patterns we study herein pertain to the overall system description. They are supposed to be attributed to the mesoeconomic level and included into the consolidated economic models. The combined approach accommodates for macro- and mesoeconomic processes.

The presented spiral model (*Fig. 6*) puts a special focus on risks. For example, a lack of professional talent, ignorance of project management techniques, lack of

information on the external environment, statistical data, etc.

Conclusions

The economic science should dwell upon realistic assumptions and provide tools for understanding and clarifying the economic environment¹⁴. V.L. Makarov, director of the Central Economics and Mathematics Institute of the Russian Academy of Sciences, confirms that contemporary economics rests on three pillars, i.e. macroeconomics, microeconomics and econometrics. The gap among the three pillars should be as narrow as possible. It turns to be rather complicated since the Russian enterprises lack scientifically proven methods for decision making. Therefore, it is important to develop the respective tools. We should note that econometric results should simply serve as the rationale for managerial decisions at any level.

Furthermore, the complexity of economic processes influences the possibility of setting illustrative and practicable mathematical models for a long-term time span, in particular. It also makes it difficult to test them for adequacy and compliance with the real economic situation. Therefore, before deciding which aspects of the model should be improved, numerical results and substantive conclusions should be primarily found and analyzed for any deviation from the reality so as to identify any drawbacks of the model and the task.

As a result of the analysis, only some equations were found to concord with the economic theory, have appropriate signs or values, which can be qualified as indicia of multicollinearity. However, even if multicollinearity is not found, some coefficients of regressors can be insignificant. The multiple regression framework gets difficult to use when some multicollinearity factors are in place, i.e. when more than two factors have a linear correlation, that is, they reciprocally influence one another. Correspondingly, multicollinearity is preferably tackled with the method which does not cause any changes in regressors and has no impact on their composition¹⁵.

However, after the tools were updated through the quadratic term c , which specifies the effect Q_2 , we arrived at adequate values of conditionally fixed costs

and conditionally variable costs that are close to input data, while coefficients of the technical axis Q_2 , which were almost zero, corroborated the independence of variables per product unit on variable costs in direct proportion to the output. There is no multicollinearity in the case of such an adjustment, since the same factor is taken into consideration and Q_2 is a technical axis. The resultant regression equations are of high practical value. It is noteworthy that we disregard time and some other factors due to the specifics of the corporate life cycle stage. That is, investment has already been made, requiring just to decide on the product mix and production volume.

Is it reasonable to earmark costs this way? The answer depends on the effectiveness of their management and control. This requires to monitor the security margin of corporate performance and adjust threshold values of production and costs at each point of time. Ongoing monitoring of relevant information and its analysis transformed into the practice of data mining¹⁶, pursuing to find any deviation and trends using up-to-date computational technologies [16], which have become so current for the recent years as a new form of the information approach.

Whereas the said indicia may be missing in business operations, the results are rather conditional, giving just an overall view. They should be detailed in accordance with a life cycle stage, external environment, regional and macroeconomic trends, etc.

Difficulties in interpreting the factor indicia may be considered as drawbacks of the proposed technique since they to an extent complicate its practical use. In our opinion, it is due to the fact that the indicator varies considerable since the model comprises yet unrecognized factors, sample size and immediate substance of the analyzable task¹⁷. Cost management has multiple aspects, necessitating further research and new approaches supplementing the one proposed herein, which would synthesize principles of performance by objectives. Departing from the traditional segregation of economic processes by level (micro-, meso- and macro) and analyzing them in their totality will give a new impetus to similar studies.

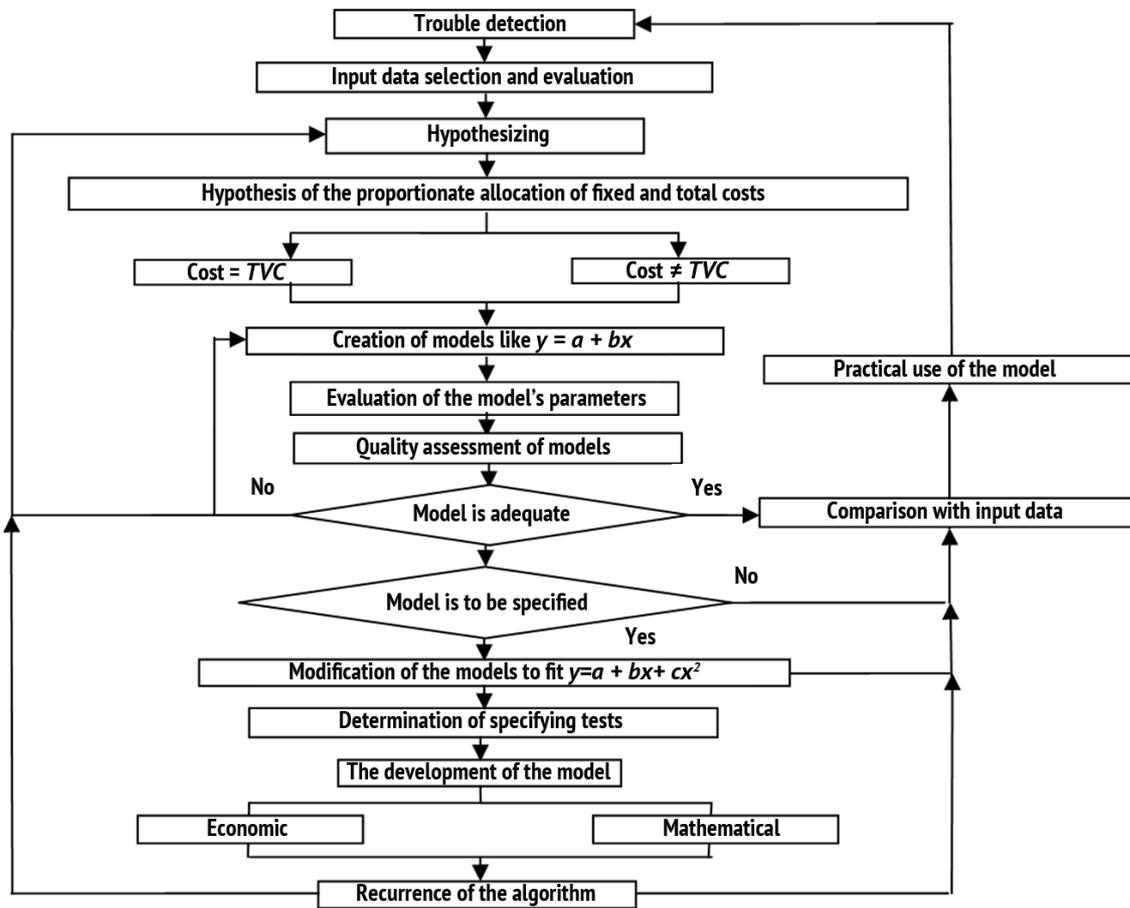
¹⁴ *Ekonometrika* [Econometrics]. Ed. by I.I. Eliseeva. Moscow, Yurait Publ., 2014, 449 p.

¹⁵ Gladilin A.V., Gerasimov A.N., Gromov E.I. *Ekonometrika* [Econometrics]. Moscow, KnoRus Publ., 2017, 228 p.

¹⁶ Knowledge Discovery Through Data Mining: What Is Knowledge Discovery? Tandem Computers Inc., 1996.

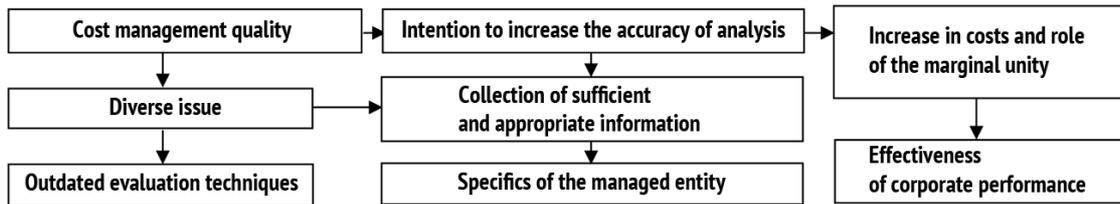
¹⁷ Magnus Ya.R., Katyshev P.K., Peresetskii A.A. *Ekonometrika* [Econometrics]. Moscow, Delo Publ., 2004, 576 p.

Figure 1
The cyclical modified technique for multilevel sequential analysis of cost management



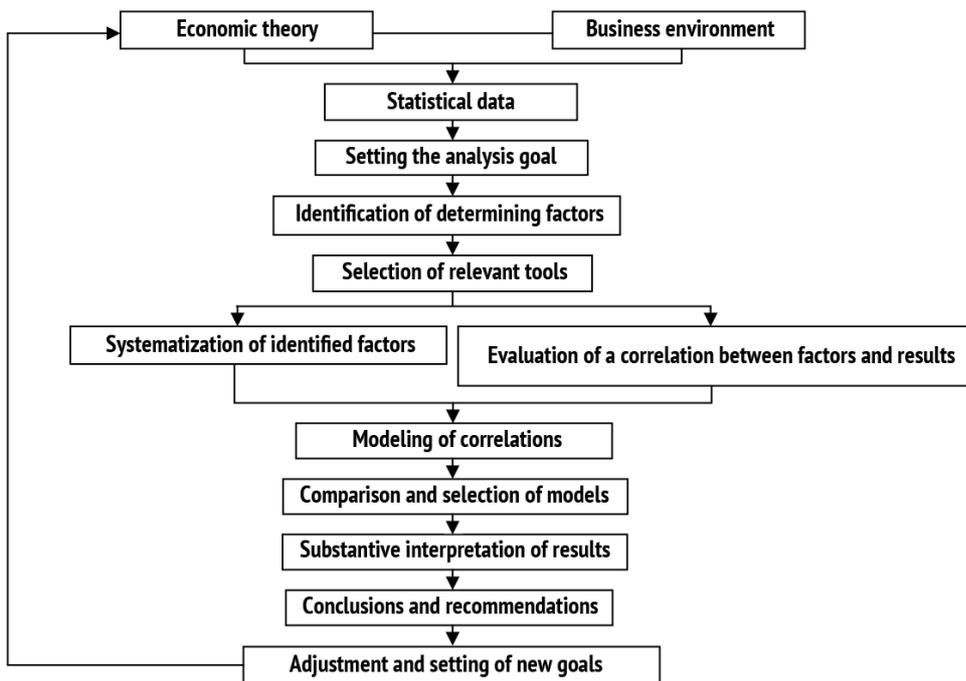
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Figure 2
The ideology behind a choice of evaluation techniques



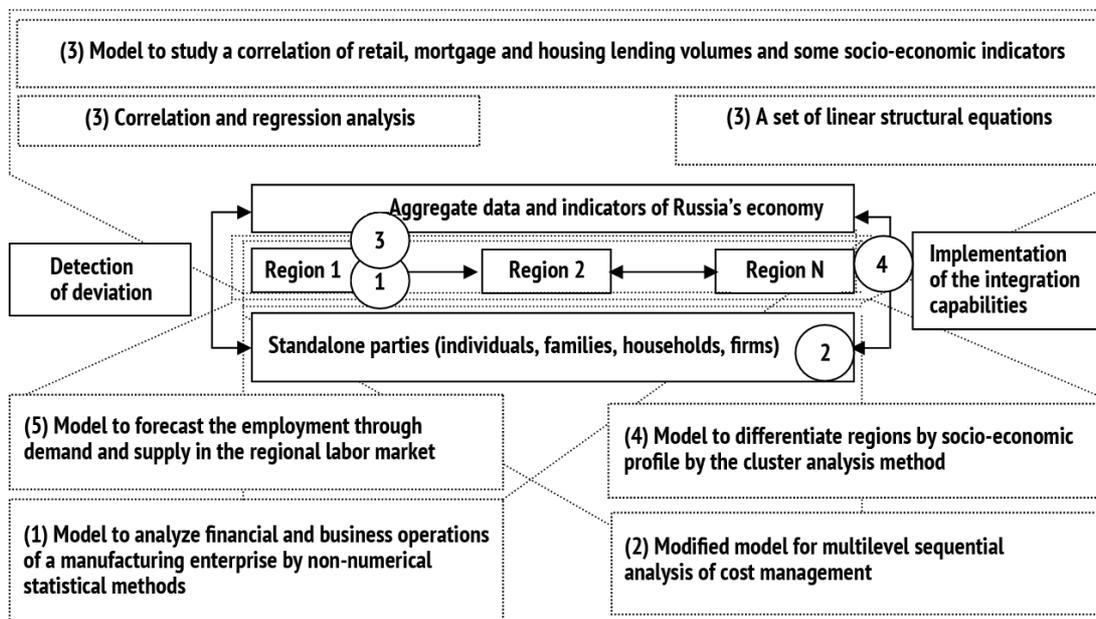
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Figure 3
The cyclical nature of research



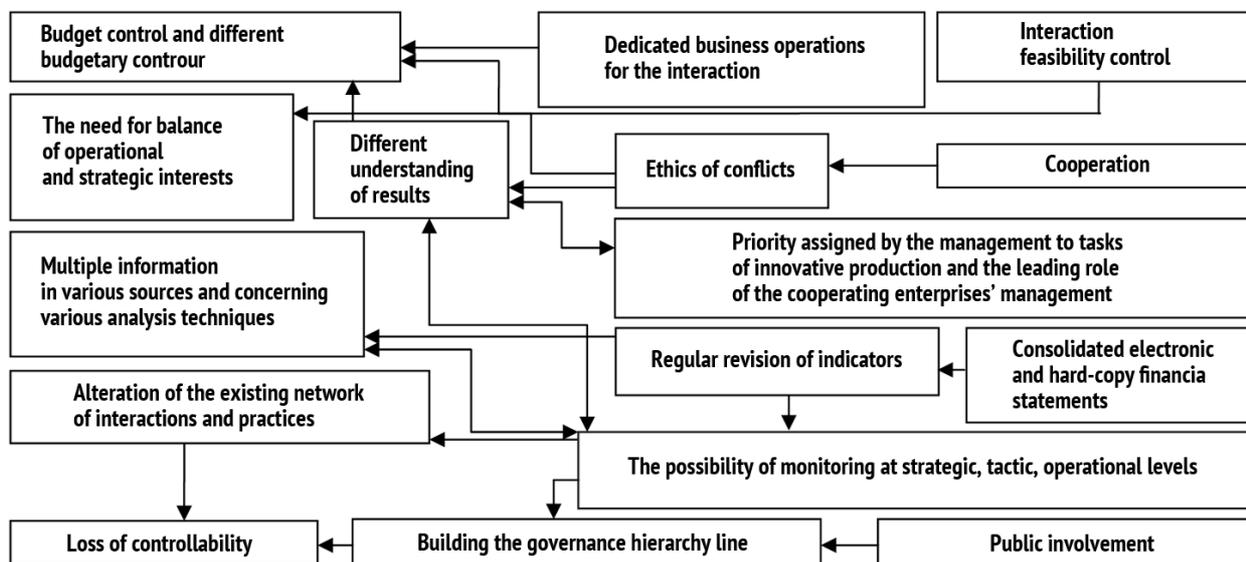
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Figure 4
The trend map of economic levels and correlation of models



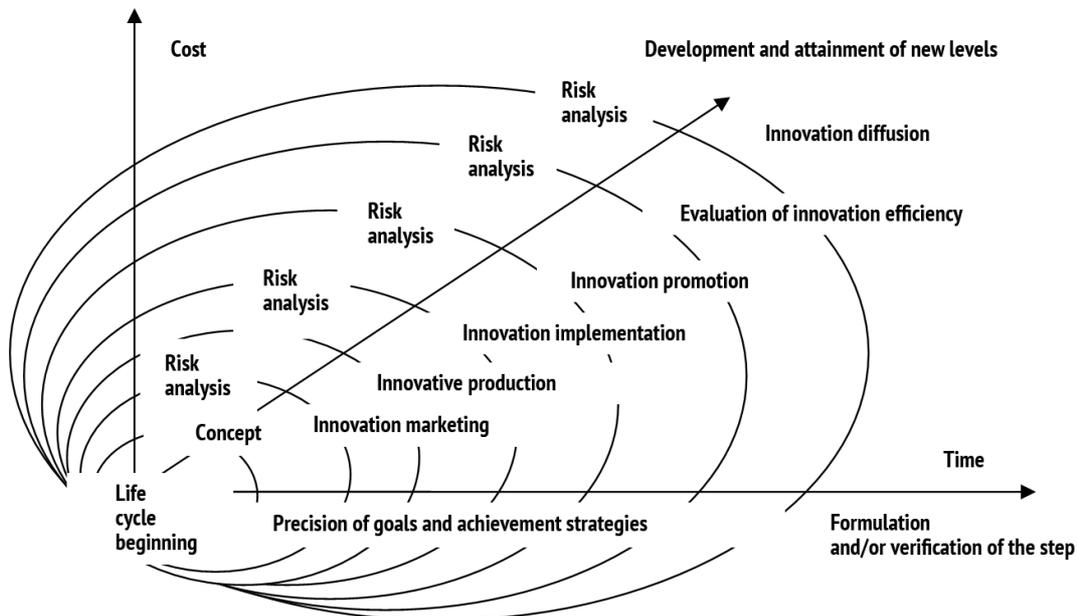
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Figure 5
The structural map of typical interaction issues and approaches to addressing them



Source: Authoring

Figure 6
The graphical presentation of the spiral method for innovative production



Source: Authoring

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Conflict-of-interest notification

We, the authors of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.

Translated Article[†]

FUNDRAISING IN THE DIGITAL ECONOMY



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Abstract

Subject Digital economy inevitably influences economic processes, economic agents, institutions, and markets. The economy is still driven by profit-making and non-profit entities, both seeking finance. The research focuses on the formation of financial resources by raising funds, as one of the elements of the financial mechanism used by non-profit entities.

Objectives The research determines the extent to which the digital economy influences non-profit organizations in fundraising activities, i.e. an increase in the number of means to search for financial resources, possibilities of using IT resources for market positioning purposes.

Methods I applied methods of logic and statistical analysis, synthesis, comparison, generalization.

Results Grants and donations are the main form of financial resources non-profit organizations obtain in raising funds. Information on websites of non-profit organizations, social networks, mass media, technological platforms reflects financial technologies streamlining cash flows and their receipt.

Conclusions and Relevance Nowadays non-profit organizations have greater opportunities for informing businesses, individuals and public legal organizations of their existence and activities. Therefore, this helps them raise more free and gratuitous financial resources through technological means of the digital economy. Financial technologies, their efficiency and consequences can be used by managers of non-profit organizations and fundraising specialists when choosing methods to raise funds.

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Digital economy reshapes operational processes of today's companies and their financial standing. The digital economy brought new mechanisms for data processing and dissemination, which various companies – for-profit and non-profit – may use to find missing or additional financial resources. Such mechanisms constitute financial technology (fintechs). Fintechs enable companies to quickly disseminate the information about themselves and their projects, thus reducing the time for attracting investors or donors and approaching more of them.

Digital economy opened a great variety of opportunities for the would-be investors and conditions for making their contributions or donations. To an extent, this became possible due to means of the digital economy. They provided vast coverage of various investment processes, communicating this information to local, regional, national and foreign investors, donors. In the current circumstances, the company may solicit financial resources from various foreign and national entities, i.e. individuals, companies, institutional investors.

The digital economy has an obvious and evident impact on profit-making businesses. They gained additional opportunities for exploring financial resources, searching for new markets to gain control over a

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URL: <https://doi.org/10.24891/fa.12.1.23>

company even if they hold the minimum percentage of shares. New technologies allowed companies to disperse shares as much as possible among shareholders, and created favorable conditions for diversifying business operations. National corporations are substituted with supranational, or transnational ones which obtain financial resources from various segments of the global market.

In the mean time, the digital economy triggered new risks and fueled the existing ones. Companies now have a greater exposure to risks of assets redistribution, commercial secret, overgrown company control, balance of interests between shareholders and managers, with the latter overriding the first. The former sources of business or financial risks are superseded with new ones. The digital economy created new advantages and new threats to corporations, without affecting the substance of the financial mechanism of a profit-making business. Businesses still work to make real profit, rather than accounting profit. They continue using the same method by cutting unit production costs. It grew even more important for a business to increment its business value since it reflects the competitiveness and lucrateness not only for national investors, but also for international ones.

What about non-profit organizations (NPO)? How did the digital economy influence their financial mechanism?

Nowadays, NPOs remain a part of the modern economy, being responsible for the production of social benefits. Scholars of the Financial University under the Government of the Russian Federation have been studying the formation of the financial mechanism for the recent years. S.V. Frumina investigates the specifics of the financial mechanism used by NPOs [1]. Theoretical principles of fundraising for NPO are studied by T.Yu. Kiseleva [2, 3]. Methods and tools for gathering financial resources, distinctions of NPOs are described in proceedings by N.A. Guz' [4] and M.V. Dubrova [5]. The specifics of the financial mechanism, its legislative framework for NPOs operating in the public sector were analyzed by E.V. Markina [6] and O.A. Gorlova [7]. Various aspects of financial position were reviewed by Yu.I. Grishchenko [8]. Fiscal distinctions of NPOs, which reasonably arise from their organizational nature, were scrutinized by S.S. Dzusova [9] and A.V. Grishchenko [10, 11].

What distinguishes the financial mechanism of NPO from that of profit-making companies is that NPO's

operations pursue goals, other than profit¹. Services they deliver as part of their official mission are rendered free of charge. NPOs can work for the public wellbeing, serving some part of the public (both individuals and legal entities) and budget of public legal entities..

Such organizations not only managed to survive in the time of the market economy, but also grow in numbers since social benefits are needed for various purposes. The financial mechanism of NPOs morphs structurally because NPOs are vested with a right to engage in profit-making activities. Some NPOs do operate to produce social benefits and need financial injections all the time. However, the other NPOs successfully produces social benefits and delivers fee-based services. Please note that we mean organizations, other than those labeled as NPO and disguising explicit profit-making and rather risky activities.

To a greater extent than profit-making companies, such companies need financial resources to feed their operations, considering the competition with profit-making companies and market risks. NPOs can now be incorporated in a variety of business and legal forms. However, whichever business model the entity choose, any of them lacks finance and needs to search for them.

It may seem that the substance and nature of NPOs, State and local authorities have very much in common. Hence, in theory, the State and local authorities could financially support NPOs. However, the State, to say nothing about local authorities, are so much laden with financial obligations that make it impossible for them to finance every NPO, though they try to do so for NPOs which do not even pertain to the public sector.

For example, in the Russian Federation, such organizations were qualified as socially oriented NPO, encompassing those ones which produce social benefits [12]. The status would empower them to obtain budgetary funds to cover about 20 percent of their expenses². Generally, the status of Socially Oriented NPO enabled some NPOs grasp their positions in the market. Various studies mentioned this fact. For example, I.V. Mersiyanova [13]. In 2014, 45 constituent

¹ Federal Law of November 30, 1994 № 51-ФЗ, Civil Code of the Russian Federation. Part One. Article 50. Commercial and Non-Profit Organizations. URL: http://consultant.ru/document/cons_doc_LAW_5142/3a585d0351c74adc4c9878b6019d704cdd9d3699 (In Russ.)

² On the competitive selection of socially oriented non-profit organizations to grant federal subsidies. URL: <http://economy.gov.ru/minec/activity/sections/SocOrientNoncomOrg/201404155> (In Russ.)

entities of the Russian Federation implemented 71 regional programs supporting Socially Oriented NPOs. The State earmarked RUB 660 million in subsidies for this purpose (intended for a two-year term)³. In 2017, the subsidies amounted to RUB 1,389,184.2 thousand. Considering such affluent financing from the federal budget, it is necessary to evaluate whether budgetary funds are spent efficiently [14], and sequestration proposals⁴.

But still, financial resources shall be found by companies, individuals or businesses. The latter can voluntarily act as founders, sponsors, investors, charity providers (donator).

The financial mechanism of NPOs traditionally consists of two elements as mentioned in the studies [2, 3]. NPOs are financial nurtured with gratuitous financial resources and financial resources provided as part of some mutually beneficial relations, or income-generating activities.

Mutually beneficial relations engender income-generating activities. As a rule, such activities are permissible for NPOs almost all over the world. Today's NPOs have pretty many opportunities to arrange such activities, indeed. They are allowed to lease out their movable or immovable property, render fee-based services, make contributions to capital of other entities, incorporate other businesses, derive income from transactions in the financial market, etc. [2].

However, a few NPOs manage to seize these opportunities effectively and completely. There are a number of reasons for this, but they mainly fail to ensure the market environment and tough competition. Nevertheless, profit-making opportunities and business efforts of individuals (sole proprietors) merged into the practice of social entrepreneurship. I draw upon research into some theoretical and practical aspects of social entrepreneurship [15, 16].

Officially, NPOs may try various options to obtain free and gratuitous funds. They may apply for various free and gratuitous options of the State (municipal) aid. For

example, grants from public institutions, charity providers and sponsors. Some financial resources will be given not only for free, but also irrevocably and unconditionally.

The concept of unconditionality should be specified. More often than not, it means that an NPO's counterpart provides financial resources, without requesting reciprocal benefits of economic or other nature. Financial resources are granted if NPOs are compliant with certain requirements. First of all, NPO's activities shall correspond with the purpose the financial resources are requested for. Furthermore, NPO requirements stipulate the status of the entity possessing the monetary funds, its understanding whether it is reasonable to provide the funds on irrevocable and gratuitous terms. For example, in 2018, the entity is eligible for presidential grants (RUB 4 billion were earmarked), if it files its application not later than a year before the final submission date. If the entity solicits a grant of RUB 500 thousand, it shall file its application form at least a half year before the said date. The entity should not have any taxes and other payments in arrears. There should not be any public and local authorities among its shareholders and legal entities undergoing the dissolution, bankruptcy procedures or being bound by the court ruling to suspend operations⁵.

The above financial resource requirements to NPOs will virtually constitute the practice of fundraising. Being part of the NPO financial management, fundraising is a relatively new phenomenon in finance. The Russian researchers have been actively studying it since the early 2000s. The theoretical framework and practical techniques of the fundraising practices were well examined. Classical methods and techniques for raising funds were analyzed by Yu.I. Grishchenko [16]. G.S. Tsvetkova and I.A. Belyaev focused their research on the evolution of the techniques during the development of the market economy [17]. I.E. Korneeva summarized fundraising efforts for a five-years' period [18]. There are reports and empirical studies⁶ ignited by an online survey of the Center for Survey of Non-Profit Organizations [19].

Fundraising has become rather a popular practice in Russia. However, there is no regulatory and legislative

³ *Nekommercheskie organizatsii v Rossii* [Non-Profits in Russia]. URL: <http://tass.ru/info/671635> (In Russ.)

⁴ Murav'eva V. B. *Eksperty KGI i OGF proanalizirovali sotsial'no-ekonomicheskuyu i byudzhethnyuyu effektivnost' finansirovaniya NKO iz sredstv byudzhetrov* [Experts of the Committee for Civil Initiatives and Russian Civil Forum analyzed the social, economic and fiscal efficiency of funding provided to NPOs from budgets]. URL: <https://civil-forum.ru/forums/2015/news/eksperty-kgi-i-ogf-proanalizirovali-sotsialno-ekonomicheskuyu-i-byudzhethnyuyu-effektivnost-finansirov.html> (In Russ.)

⁵ Foundation of Presidential Grants. URL: <https://президентские гранты.рф> (In Russ.)

⁶ See DocPlayer.ru. as an example. URL: <http://docplayer.ru/56071584-Pyat-let-fandrayzinga-v-rossii.html> (In Russ.)

framework for fundraising in Russia. Regulatory documents do not stipulate such a concept, without setting any general rules which would govern the practice. For example, the obligation of NPOs which obtained grants publicly disclose their expenditures. Legal relations as part of fundraising are formulated as donation clauses of a contract governing terms on which NPOs obtain financial resources and how donors transfer them.

As I mentioned, there are several types of proceeds NPOs receive, which resemble resources from fundraising. These are governmental subsidies, grants (governmental, municipal, private), membership fees and donations. Do all of them pertain to fundraising? In my opinion, fundraising includes only donations of legal entities and individuals, grants of legal entities, governmental bodies and local authorities.

Public institutions provide subsidies only on specific terms. NPOs shall have a certain status (for example, Socially Oriented NPOs) or legal and business structure. For example, it shall be a State-financed institutions or take part in State-financed programs sponsored by governmental agencies or local authorities. Moreover, budgetary subsidies are always granted on terms of equity financing. So, NPOs have to finance some special-purpose expenditures with other monetary resources.

Membership fees are very close by nature to donations. However, a member of a non-profit organization counts on a reciprocal intangible service. For example, protection (professional unions) or support of interests, lobbying such interests in governmental agencies and local authorities, performance of ideological ideas (social organizations, political parties), etc.

Monetary funds NPOs obtain from sponsors are irrevocable and gratuitous. Nevertheless, NPOs shall meet additional requirements. For example, an NPO shall place the sponsor's advertisement or conduct a PR campaign. Doing so, sponsors pursue their economic goals, though they formally provide monetary funds to NPOs free of charge.

Donations and grants are the only funds NPOs receive without returning something back, performing stringent conditions. They are perfect example of fundraising (*Table 1*).

Fundraising efforts may be taken for a certain project, program or activities of an NPO as a whole.

The practice of raising funds originated at the end of the 19th and beginning of the 20th centuries.

Fundraising existed in the Russian Empire, but was finally recognized in Russia at the end of the 20th century as a practice adopted from advanced economies. Advanced economies elaborated fundraising methods for NPOs throughout the entire 20th century. They observed private or corporate donations. Solicitation of donations is quite a new task for the Russian NPOs today.

As many researches into NPOs show, private donations and contributions are the main channels of finance for such organizations. This conclusion has an empirical underpinning gathered for five years, though there is conventional thinking that the Russians are very reluctant in donating to NPOs (5 to 7 percent of people) [20].

Donations contravene the very idea of the market economy so much that it is extremely difficult for NPOs to find them. To deal with such financial issues, NPOs can independently search for those who can provide financial resources irrevocably and free of charge. It can also apply to a special (fundraising) company which works as a professional adviser for attracting financial resources. In the latter case, some of the resources are remitted to intermediaries. The fact that the fundraising company serves as an intermediary leaves donors anonymous, thus making the use of financial resources opaque for ultimate recipients and blurring the purpose of monetary funds. In this respect, the key principles of financial resources gathered through fundraising, i. e. transparency, target and purpose, may be distorted when they are transferred via a fundraising company. That is the reason why donors prefer remitting financial resources to NPOs directly. Donors can contribute whichever amount they want to, but sometimes the Russian Government or other executive body can set up limits for such donations. Currently, regulators discuss donations and contributions to political parties and suggest limiting them to RUB 3 million.

NPOs must articulate definite goals and tasks, estimate costs, analyze available financial resources and would-be donors, outline the plan of an initiative in question or algorithm for implementing the project. The program for raising financial resources shall help choose appropriate tools to do so and evaluate all possible effects (implications).

It is a paradox but it is fundraising that made NPOs engage in advertising and marketing. Donors will grant their money only if NPOs convince them to and persuade that the initiative is socially reasonable and

useful. Representatives of NPOs shall know who is able to donate and what motivation should lie behind this donation, etc. They should carry out an ongoing survey. Their positive publicity and image help them secure their goals. Many NPOs are guided by intuition, rather than professional reasoning. Therefore, they get insignificant results or need a substantial input in terms of money, manpower and information. That is why contemporary fundraising is not only about searching for money, but more about hiring the talent (accountants, financiers, legal attorneys) on voluntary and free terms. It requires information channels to advertise activities or programs NPOs are engaged in. This dramatically reshapes the organizational technique of fundraising.

As the economic landscape changes, traditional fundraising techniques perish, i.e. bulk mailing, charity boxes, contributions to the most readable magazines, etc. Some of the techniques transform into something new. Modern technology enables NPOs to advertise themselves without professional intermediaries, thus cutting their costs for attracting donors and investors. Whereas specialized entities seek financial resources for NPOs on a fee basis, and costs for correspondence, paper, voluntary workers can be substantial. Declining intermediaries' services, NPOs increment its financial resources earmarked for the core activity and reduced transaction costs.

The digital economy produces technological tools for NPOs to find financial resources. Modern fundraising draws upon the Internet and mobile networks.

Making video clips about activities or certain projects and their presentation on video hosting websites (YouTube) help pitch NPO's projects comprehensively and illustratively at a low cost. It was hard to imagine several years ago that NPOs would be able to have their own websites. Under the current circumstances, such websites are mushrooming. Large State-financed, autonomous institutions, charitable foundations, endowment foundation and so on have long been using web-resources in their operations. The web-resources help NPOs make a full and detailed presentation of their activities, projects and challenges.

Nevertheless, some NPOs still have financial difficulties in setting up their own website. In addition, website support costs turn to be significant and even higher than website development costs. In the mean time, network resources set off some or all costs since their demonstrate the NPO's persistence in its goals and, to an extent, its financial sustainability. The network

resources work as a kind of *declaration* that NPOs intends to survive and operate in the market economy. Admittedly, websites for NPOs become just a matter of time since such technological platforms or joint website make it much easier for NPOs to announce about its existence and mission.

It is common knowledge that the contemporary society emphasizes its socially-oriented focus and commitment. People strive to take an active part in various profit-making and non-profit projects of NPOs. There are web-resources which allow to collect funds in order to support NPOs' projects. Some of them are developed specifically to raise funds, the other ones serve for various purposes.

Upon the onset of the digital economy, fundraising companies managed to preserve their activities, but refocus it. New fundraising platforms are created to allow small NPOs to come into the spotlight. They rearrange the relationships between fundraising companies and NPOs. NPOs used to acts as a passive party absorbing financial resources, while fundraising companies actively cooperated with the business community, governmental and municipal authorities and secured monetary funds for NPOs. Nowadays, such companies set up a computer-aided platform, letting NPOs pitch for their activity, attract would-be donors. Fundraising platforms can be created for a specific project or a publicly important initiative.

Fundraising platforms for non-profit projects win the best public awareness. For example, <http://dobraya-pokupka.ru/> was set up to raise additional funds for educational, cultural and charitable purposes. The platform helps charitable foundations and endowment funds to obtain financial resources. Monetary funds which buyers remit when buying goods in a certain retail chain are granted to specific charitable funds, programs or endowment funds of universities (for example, Foundation for the Development of MGIMO-University, Foundation of Special-Purpose Capital of MISiS).

In 2016, *Sdelai!* fundraising platform was launched in Moscow, Russia. *Sdelai!* helped gather RUB 8 million for projects of certain foundations⁷. Technological platforms for NPOs yet need substantial resources, expenses and costs for maintenance, which hampers their proliferation and popularity. Web-resources are more frequent option serving a specific area of NPO's

⁷ NPO Lab. Mass charitable fundraising. URL: <http://xn--80adfe5b7a9ayd.xn--80adxhks/ru-RU/news/on-portal/card/1575.html> (In Russ.)

activities, including donations. For example, EcoDelo web-resource embraces all members of the environmental protection movement, including projects of NPOs for natural protection⁸. Blago.ru is called to support charitable organizations of Russia. Donations are accepted online. The web-resource collects about RUB 1 million every month.⁹

Television and radio are also involved to gather financial resources, broadcasting the information about people who need financial support, explains causes. If announcements are made at prime hours, it significantly expands the coverage and increases an amount of potential donations. These media are more effective for NPOs than technological platforms since the TV audience are much broader than the number of the Internet users who have to search for such information on purpose. For purposes of fundraising, the above media can be ranked as follows: television – Internet – radio – press.

Social networks became a new fundraising vehicle. They reach out to more private donators and involve them into projects. According to the Charities Aid Foundation (CAF), about 63 percent of NPOs use social networks, with the prevailing use of Russia's V Kontakte, which is followed by Facebook¹⁰. The mechanism is very popular among those NPOs which deal with health, child-rearing, protection of children, teenagers, etc. In addition to fundraising, NPOs employ social networks more effectively to improve the publicity of their activities and attract volunteers.

I should mention the collection of funds via SMS. It is an effective method, to a certain extent, gathering 40 percent of total private donations. The method becomes more widely spread as technological and IT capabilities of mass media and mobile communication provides are united to obtain more financial resources. Considering traditional methods, including charitable boxes and auctions, the Russian population donates about RUB 143 billion to NPOs annually.

The digital economy forges new technological mechanisms to transfer funds to NPOs. In addition to SMS, electronic wallets (ApplePay, PayPal) and credit cards are used.

⁸ EcoDelo. For NPO. URL: https://ecodelo.org/77-dlya_nko (In Russ.)

⁹ Blago.ru. URL: http://cafrussia.ru/page/blago_ru

¹⁰ *Rol' sotsial'noi seti V Kontakte v razviti i prodvizhenii NKO* [The role of V Kontakte social network in developing and promoting NPOs]. URL: http://cafrussia.ru/page/rol_socialnoi_seti_vkontakte_v_razviti_i_prodvizhenii_nko (In Russ.)

Video-conferences of NPOs help donators or contributors explore the potential of a company and reasonableness of funding.

NPOs see the bidding mechanism gradually changing when they solicit governmental or municipal grants. Governmental and municipal authorities, profit-making and non-profit organizations, individuals release information about grants, thus making the bidding process as transparent and efficient as possible in terms of the fair allocation of financial resources. Fundraising mechanism open up the information about activities of an organization and its financial needs.

In the mean time, fundraising stalls in its development since NPOs' expenditures lack clarity and transparency. Control over NPOs' spending is a very topical issue. It concerns the way and extent to which financial resources are used. While profit-making entities are toughly controlled by fiscal authorities, NPOs involved in profit-making efforts remain almost out of fiscal control. As a rule, conducting the officially declared activity, they are often exempt of key taxes (for example, property tax, VAT, car tax, land tax). Hence tax authorities almost do not have authority to control the financial performance of NPOs. Founders and major contributors act as controllers to some extent. However, ordinary members of non-profit corporations have formal power to control the use of fund provided. As NPOs develop and web-resources expand, reports on the use of funds will cease to be a formality, but rather become a valuable piece of information.

The contemporary economic environment will make business and private donators reformulate their motivation for funding NPOs. The society proclaims new incentives to donate at every phase of its development. At the beginning of the 20th century, control over entities was de-personified through charitable foundations. The Rockefeller Foundation was meant to serve noble goals. However, concurrently, the Rockfellers' stocks were transferred to it too. The business enterprise was formally owned by the Rockefeller foundation, but virtually managed by the same family. Afterward, the Rockefeller Foundation stepped into the period of fiscal benefits provided the organization was engaged in charity. Nowadays, the organization prioritized the socially oriented positioning.

On the one hand, businesses perceive their involvement in project financing or activities of NPOs as their social liability, but, on the other hand, they get an opportunity to advertise their activities and raise their

publicly. Tax benefits are granted only after, followed by the possibility to assume control over the business.

The Internet mechanisms became crucial drivers of the process since they build a sustainable image for a company, but may put it a stake at the same time because any sudden and undeliberate words or actions may seriously undermine the image of the donating company or private donator. The same is true for NPOs.

Modern financial technology help capture a broader audience which may provide financial resources to NPOs. The financial technology increase the reasonableness and transparency of the processes, but simultaneously raise the responsibility of NPOs for

using the financial resources they obtained. Common web-resources facilitate the finance of various projects NPOs implement. Technological platforms enables them to raise funds of legal entities and individuals, reaching out to new donators. Drawing upon the technological platforms, NPOs communicate to a greater number of businesses and individuals about its mission, activities and a lack of financial resources.

As for donators and sponsors, modern technology helps them improve their image and position their entities as socially responsible and oriented businesses, and find an effective method to advertise their companies. In the mean time, the technology raises their responsibility for funding any noble goals.

Table 1

Comparative analysis of the main forms of funding provided to NPOs

Type of Funding	Frequency	Terms of Funding
Grants	One-off	Bidding for grants
Subsidies	Repetitive	Participation in State-financed programs, certain status, equity finance
Membership fees	Recurring	Agreement with the philosophy of NPO
Donations	One-off or irregular	Support to NPO
Sponsorship fee	One-off	Publication of the sponsor's advertisement or arrangement of its PR campaign

Source: Authoring

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Conflict-of-interest notification

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.

Translated Article[†]**SPECIFYING THE LIFE CYCLE PHASES OF REGIONAL INNOVATION CLUSTERS****Denis A. NIKOLAEV**Kazan Innovate University named after V.G. Timiryasov (IEML), Kazan, Republic of Tatarstan,
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phases**Abstract****Subject** The article discusses the creation and operation of regional innovation clusters in the Russian economy, primarily, in terms of their life cycles.**Objectives** Analyzing views of other scholars, I propose an original approach to development phases of regional innovation clusters and determine possible ways for the region and regional innovation cluster to integrate throughout phases.**Methods** The research uses the abstraction and logic method.**Results** I suggest complementing the traditional linear sequence of life cycle phases with alternative scenarios. The traditional list of the phases, which most scholars point out, is supplemented and described in more details, *inter alia*, by highlighting interim phases and giving account of key actions performed within the analyzable process. I discovered new phases of regional innovation clusters' life cycle, such as the preliminary preparation in pursuit of synergy, adaptation, reassumed development. New interim phases include the pre-synergistic growth, synergistic growth, storming, decay, mutation. I also examine the integration of the region and regional innovation cluster at each interim phase.**Conclusions and Relevance** All alternative development scenarios spring from points at which the evolution of regional innovation clusters may vary. Strategic decisions or crucial solutions made at such points contribute to further growth (or decline) in the cluster. The preliminary preparation, creation, adaptation, development are the most important phases when the region has to be as much involved as possible at the variability points of its evolution. The cluster demonstrates the highest productivity when it reaches the maturity phase during storming or after it reassumes the development, being mature.

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Currently, there are dozens of regional innovation clusters in Russia. The USA is the home for the largest number of clusters worldwide (380 clusters [1]), with the predominance of regional innovation clusters. However, the Russian innovation clusters evolve not so effectively as they could because they do not emerge naturally but rather represent the combination and venture of already operational companies. In the mean

time, in the current crisis situation [2, 3] it seem too unrealistic to see them spring out of nowhere in the Russian market. That is the reason for defining phases which would aggregate positive aspects of both processes and accommodate for the specifics of regional innovative clusters. Under the current economic circumstances [4–6], it is necessary to examine the issue and find feasible ways to integrate the regional innovative cluster into the regional economy and clarify what situations will require the regional authorities' involvement as much as possible

[†]For the source article, please refer to: Николаев Д.А. Уточнение этапов жизненного цикла региональных инновационных кластеров // Национальные интересы: приоритеты и безопасность. 2019. Т. 15. № 2. С. 343–358. URL: <https://doi.org/10.24891/ni.15.2.343>

and which cluster may be less burdensome and more useful for the region¹.

What it is important to understand for the stewardship of the regional innovation cluster is the reciprocal role the region and cluster play for one another at each of the phases.

Scholars have identified the following cluster development phases:

- 1) emergence of the cluster creation initiative;
- 2) formation of the cluster;
- 3) development of the cluster;
- 4) growth in the cluster attractiveness;
- 5) maturity;
- 6) formulation and acceptance of the cluster development strategy;
- 7) decline and dissolution of the cluster;
- 8) transformation.

Fig. 1 outlines such a model. The statements below appear to constitute the general drawbacks of the concept.

1. Development phases are linear. That is, each phase begins after the completion of the previous one.
2. A group of entities united by a certain principle is a cluster as is.

Referring to views of other authors and pinpointing the principles which will suit for the further development and additional elaboration, I model life cycle phases of regional innovative clusters.

D. Katzenbach and S. Smith provide their vision of project team building [7]. Drawing upon the previous

¹ In the Russian Federation, the majority of clusters are evolving. In particular, IT clusters in the Perm Krai (founded in 2013), Penza Oblast (2013), ICT cluster in the Rostov-on-Don cluster, local innovation cluster of navigational, telematic and geoinformation systems (GLONASS/GPS) in the Orel Oblast (2015), IT cluster in the Smolensk Oblast (2015), IT cluster in the Novgorod Oblast (2014). Few clusters are mature. These are the IT cluster in the Republic of Tatarstan (2015), Siberian Science Polis Research and Production Cluster (2013), Development of Information Technology, Radioelectronics of Mechanical Engineering, Communication Facilities and Information and Communications of Saint Petersburg (1999). However, the above cluster cannot pass the maturity phase. Clusters may be so slow in their development because their preliminary phases were based on low quality analytics, neglecting what conditions a cluster lives in during the adaptation phase. Furthermore, the reason may be that the region and regional innovation cluster had controversial reciprocal expectations, thus cooperating in an erroneous and inappropriate way.

research, the authors presume that all teams undergo the same steps during their formation (*Fig. 2*). At the initial step, a group of people is convened, with each member demonstrating a certain performance level. It is totally equivalent to the level which is denoted as *a single leader group*. People set up contacts and rearrange processes subsequently. General productivity hits its lowest level as an example of a quasi-team. At this point of time, communications and processes become a supportive factor for the team, while the team building advantages also starts generating positive effect. The team's performance is booming. At a certain point of time, the (potential) team works as effectively as people did before their convention. Continuing their work, the team reaches their normal performance indicators, which should be higher than the total of some individual members [7].

Similarly, we review the productivity of a cluster when it is set up and developed. As mentioned above, at the initial phase, the cluster is made up of pioneering companies, which have already showed some productivity and performance. Total productivity is denoted as 1 in *Fig. 3*. The productivity may subsequently go down, with the lowest level being plotted as 2. The decline stems from new ties within the cluster, developments in logistics, new processes and strategies within the company. I call this interim phase the adaptation period of the innovation cluster development. A.A. Kireeva pays great attention to the creation and development of regional innovation clusters in her research [8], however saying nothing why such clusters perform worse afterward.

After the cluster hits the lowest level, its productivity assumes to rise. In the mean time, I should point out the period starting from the lowest level of productivity up to the identical productivity of companies (before they were combined into the cluster) and denote it as the interim phase of pre-synergistic cluster development. It is important to phase out the period between points 1 and 3 in *Fig. 3* because it helps make such a decline less sharp if such periods of the cluster operations are recognized. D.V. Frolkin revealed the importance of such prior preparation but he did not mention that the synergy of the future cluster constituents should be preliminarily raised as well [9]. As a matter of fact, the preparation process suggested by D.V. Frolkin is a line between point 0 and 1 (*Fig. 3*) running side-by-side the x-axis. I should admit I share this idea.

The section depicted with line 0–1 is the phase of the cluster origination. During the phase, the cluster creates conditions which determine to what extent point 2 descend. In this case, the region has no direct impact on the pioneering companies but it can begin preparing the cluster infrastructure. This is the cluster planning phase when the cluster is evaluated in terms of feasibility and reasonableness, its functions are analyzed and forecasted, respective strategy is outlined, regional budget is formed, cluster structure is described. The optimization of logistics, composition of residents determine the level of point 2. During the phase, it means that the productivity of the regional innovation cluster remains the same without any dynamics. The reason is that the same interaction processes take place as at the phase of pioneering companies, while the integration processes involves only some employees of the companies (management, analysts and region's representatives) who condition the structure so as to make the transition as soft as possible. Therefore, the more profound preparation for the development at the origination phase, the higher the position of point 2.

After point 3 is passed (here the cluster becomes identical to total productivity of standalone companies), the graph goes toward point 4, where the cluster reaches the performance indicators planned during the creation phase. Starting from this moment, the cluster comes into its maturity phase. I call the interim phase, which takes place between points 2 and 4, a growth. The section between points 4 and 5 corresponds with the stabilization and transition to the maturity phase when the productivity cannot grow as actively as at the growth phase. Passing through this section, the growth gradually slows down, and the cluster sees the productivity stabilize at a certain level. This happens when some factors (market structure, active participation of the region, interaction within the cluster) get balanced. It is noteworthy that the phase may start when the productivity is different from the planned one, being lower. In this case, it is easier to push it to the planned trajectory than at the maturity phase due to the inertial motion.

I should note that the section between points 1 and 3 appears to be the most complicated phase of the relationships between the region and regional innovation cluster. The productivity of the cluster is minimum then, however, the demand for regional aid is maximum. Passing through this section, the region should assist the cluster as it used to so as to derive the

benefit in the future as it planned. It should help the cluster create the infrastructure, raise necessary funds and establish external contacts of the cluster. The integration of the real and financial sector of the economy is studied in the research referred to herein [10]. It is important to remember that the innovation sector needs a substantial aid from the State at the initial phase of investment.

I consider the points at which the cluster may have alternative rising or falling scenarios as points of the evolutionary variability of the regional innovation cluster. Such points may have different sources and strongly depend on the phase when they spring.

Although taking place rarely, there exists another economic situation (though A.A. Zaika tags it typical [11]) when the cluster reaches some maturity phase after the origination and development phases are passed. During the protracted maturity phase, the productivity is permanent (or fluctuates within an insignificant range). I presume, it is impracticable to attain a level and stick to it for a long period of time. Abstaining from further development and growth, many issues and challenges may pile up, thereby leading the cluster to a decay, namely:

- changes in the demand for products;
- logistic troubles;
- cessation or decline in external interactions;
- declining interest of the regional authorities in the cluster.

This is the reason why the maturity phase may end rather quickly and turn into the decay if the cluster shifts from the development to maturity without striving to improvements. I suggest tagging the interim phase preceding such decay as stagnation. In *Fig. 4*, the dash-and-dot line denotes a curve which emerges in the real life situation when the cluster attempts to level off during the maturity phase. The dash line shows a graph proposed by V.V. Spitsyn [12]. V.V. Spitsyn gives the fullest account of the maturity phase model. Hence, I rely upon this description to further unfold it and adjust for real factors.

Therefore, there should not be an even and stable level (from point A to point C) during the maturity phase. This opinion diverges from the previous models implying that the cluster evolves (this process denoted as the section from A to D – the continuous improvement process) or stagnates (starting from point B to point F).

It is evident that it is impossible to make the cluster grow as it did during the development phase. However, some improvements are still practicable.

In regional innovation clusters, storming phases can stem from various factors. The factors have both *regional* and *innovation roots*:

- cancellation of funding or region's aid to the cluster due to changes in the regional development priorities or overall decline in the region;
- alterations in the geopolitical position of the region (for example, D.A. Rovin gives an example when the Dalian cluster was formed after the Chinese government decided to open the region for foreign investors in 1984 [13]).

To address the above issues and put an end to storming, I suggest undertaking the following steps:

- determining the significance of the cluster development as part of the interaction with the regional authorities;
- adapting to the available financial resources;
- adapting to the market requirements;
- accommodating the market for existing needs or requirements.

The return to development deserves a special mention since it is an alternative interim phase of maturity. The process sees an explosive growth of the cluster upon its maturity. This may happen at the evolutionary variability point due to the following reasons:

- 1) successful elimination of strategic difficulties;
- 2) revolutionary breakthroughs driving the cluster to a new market;
- 3) intense aid from the region during the maturity phase.

Fig. 5 depicts the interim phase between points A and B.

The cluster steps into the last phase of its life cycle, which springs from its evolutionary variability point, starting to *decline*. The decline has three alternative scenarios, i.e. reemergence, transformation or dissolution. The reemergence and transformation are similar in terms of structure but still have some distinctions and virtually represent the rearrangement. As per the first scenario, the cluster undergoes so dramatic changes that the cluster's indicators plummet

from the very beginning (down to point 1. See *Fig. 3*). It is worth mentioning that the appropriate and correct strategy will help the cluster survive, passing all the phases of development.

Transformation also entails a drop, though not a drastic one. Transformation deeply reshapes the structure of the cluster. The reemergence and transformation of the cluster make it more viable since it skips the creation phase, while the existing infrastructure and expertise allow to reduce the duration of the development phase. The cluster dissolution is a process when the cluster terminates to exist. In *Fig. 6*, solid and dash-and-dot line depict the dissolution of the cluster. The dashed line means the reemergence, with the dotted line indicating the transformation.

Transformation and reemergence can take place in the following cases:

- 1) the cluster is in deep recession (causes are the same as for the storming phase), which is overcome through transformation;
- 2) the cluster decides to adapt to the frequently changing market of innovation;
- 3) the region forces the cluster to undergo a deep transformation.

The cluster dissolution is an alternative to transformation and reemergence. There are two absolutely different approaches to dissolve the cluster.

1. The cluster preserves the same composition of companies which reside in it (line A–C in *Fig. 6*);
2. Companies of the cluster are dissolved (line A–D in *Fig. 6*). This scenario is probable when multiple clusters go bankrupt.

What makes both options different is the ultimate point of the productivity. In the first case, the productivity point will considerably go down (down to point C). As a rule, the level will anyway remain higher than that before the formation of the cluster. The reason is that research and advantages of standalone companies, which they created joining the cluster, contributed to their competitive advantage. In the second case, mass bankruptcy of companies will bring the productivity down to zero. In *Fig. 6*, the continuous line denotes the dissolution of the cluster and residing companies, dash-and-dot line indicates the scenario of saving the residing companies. Point C is the last possible point of the cluster's evolutionary variability.

It should be mentioned that the decline may start after any development phase (for example, in *Fig. 7*, the decline is missing not only after the maturity phase but also during the development phase). Researches indicated herein provide a more detail account of the causes [14, 15].

Summing up, I can point out the following phases in the cluster structure as indicated in *Fig. 7*.

1. Preliminary preparation with the focus on synergy (Section 1–2).
2. Creation (Point 2).
3. Adaptation (Section 2–3).
4. Development.
 - 4.1. Pre-synergistic growth (Section 3–4).
 - 4.2. Synergistic growth (Section 4–5).
5. Maturity.
 - 5.1. Storming (Section 5–10).
 - 5.2. Stagnation (Section 5–6).
6. Return to development (Section 8–9).
7. Decline.
 - 7.1. Transformation (Section 10–11).
 - 7.2. Reemergence (Section 10–12).
 - 7.3. Dissolution.
 - 7.3.1. Preservation of the cluster-based companies (Section 10–12–13).
 - 7.3.2. Dissolution of the cluster-based companies (Section 10–14, 15–16).

It is important to understand that the above phases are not linear with respect to each other. Thus, the cluster may get to the dissolution phase not only from the stagnation, but also from storming, growth and adaptation.

Analyzing the phases, I conclude that neither of the phases is an even and linear section. Hence, the cluster may demonstrate the different pace of development (pre-synergistic and synergistic growth, return to maturity, storming, return to development) or decline (adaptation, stagnation, transformation, reemergence, dissolution).

Therefore, *Fid. 7* displays key phases (preliminary preparation, creation, adaptation, development,

maturity, decline), their interim phases (pre-synergistic growth, synergistic growth, storming, stagnation, transformation, reemergence), and variability points (points 4, 5, 8, 12). The cluster will definitely be a greater success, if it manages to return to its development during its maturity phase, while declines entail transformations.

In the mean time, the substance of the cluster development process can be comprehended through some structural and psychological aspects (research referred to herein [16] explains the importance of admitting the relationship of economy and psychology). For this, I suggest applying the Cynefin framework proposed by D. Snowden. The Cynefin framework offers four types of systems.

1. *Chaotic systems* without the cause-and-effect relationships. It is impossible to make assumptions and conclusions in such systems.
2. *Complicated systems* without the cause-and-effect relationships. Even if the system is exposed to two identical effects, it may generate the different outcome.
3. *Complex systems* where some experts do identify the cause-and-effect relationships.
4. *Obvious (simple) systems* with the cause-and-effect relationships.

Being initially in the first context, the system can morph into any phase so that it unavoidably passes through all the phases preceding the current one² [17]. For example, the system will exist in contexts 1, 2 and 3 within a certain period of time to get to context 4.

The Cynefin framework can be compared with the model proposed herein. During the preliminary preparation, creation and adaptation, pre-synergistic growth (section 1–4 in *Fig. 7*), transformation (section 10–11) and reemergence (section 10–12), the regional innovative cluster is very likely to be chaotic. Hence, the business leader should have crisis management skills to tackle such a situation at this phase [18].

Fig. 7 gives a view of complicated systems at the sections of synergistic growth (section 4–5) and return to development (section 8–9). At these phases, the business leader should be flexible and strive to aid the cluster-based companies to agree upon tactic plans and methods of internal and external integration.

² Snowden D. *Liberating Knowledge*, in *Liberating Knowledge*. CBI Business Guide. London, Caspian Publishing, 1999.

Complex systems may correspond with the maturity phase in its different forms, i.e. storming (section 5–10), stagnation (section 5–6). Under such circumstances, the business leader should be conversant with the classical management model (development and implementation of high-end strategies, key decision-making, etc.).

However, the cluster cannot turn into the obvious (simple) model since there always exist or will arise new implicit cause-and-effect relationships and the extent to which the cluster depends on such relationships can be evaluated by experts.

In this respect, there we can note an unobvious consequence implying the regular rotation of leaders at each of the above development phases, or their timely retraining in accordance with changes, or the initial appointment of a versatile professional to lead the cluster who would embody all these things.

Furthermore, it is important to strongly motivate the cluster leader and provide all necessary levers to encourage his/her subordinates (the aspects are described in detail in the research referred to herein [19]).

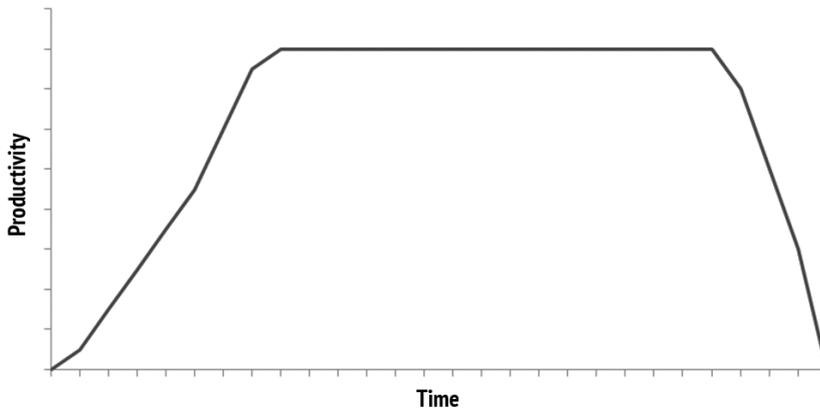
I made the following findings in this research. First, I pointed out a new phase when the cluster returns to development, which means that the mature cluster can reassume an explosive growth. Second, the decline phase has three possible scenarios, i.e. transformation, reemergence and dissolution. Third, I explained that the cluster development is not linear. Actually, I illustrate that there is no definite sequence of the cluster's life cycle phases. They can morph into each other as a result of multiple combinations. Forth, the cluster should not strive to level off during the maturity phase. If it levels off, it will definitely decline soon. Therefore, the cluster undergoes the phase of growth or decline. In other words, as per the model, the cluster cannot remain stable. It constantly passes phases of growth (at different pace) or decline (with different intensity). Furthermore, the research introduces the concept of

evolutionary variability points of regional innovative clusters. Such points open up alternative scenarios of the cluster development. What is more, the model accommodates for psychological and professional traits of business leaders, which they may need at different development phases of the regional innovation cluster.

The research into the life cycle of regional innovation clusters can prove useful when such clusters are designed and created, guiding their development. Detailed description of each interim phase helps understand more profoundly how the region and respective regional innovative cluster are integrated. Regional authorities get a better knowledge of moments when their aid may be most effective for the cluster, how regional authorities' decisions can influence the development of the innovative cluster (inhibit or spur its growth).

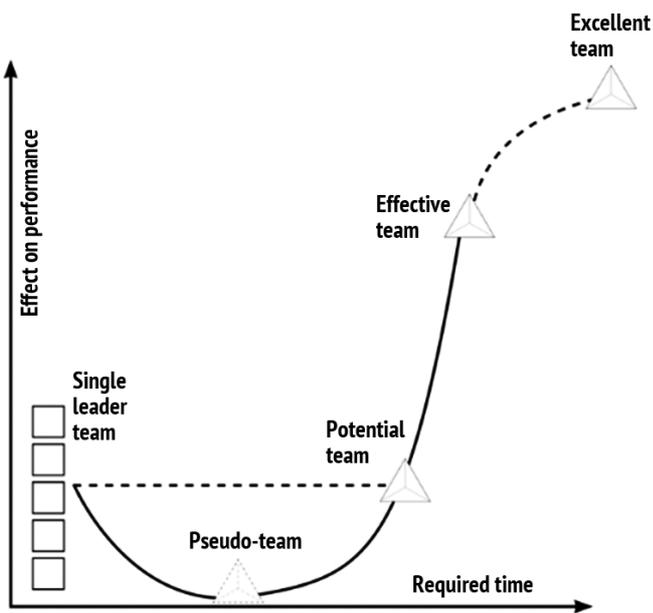
If the most effective phases are determined (when the cluster may generate the highest benefits for the region), this will streamline the cooperation of the cluster and region. The article sets out respective mechanisms and levers to facilitate the process. For example, the region does not have a direct impact on pioneering companies upon their origination. However, it can prepare the cluster infrastructure. The thorougher the strategic planning of the regional industrial cluster, the more successful the cluster development. During the adaptation and pre-synergistic growth, the region should support the cluster as much as possible. If the regional innovative cluster is already mature, the region may expect the greatest benefits from the cluster and continue to support it. If the region provides the aid to the cluster substantially, the cluster is very likely to reassume its development and subsequently improve its productivity as compared with the storming phase. If the cluster declines, the region can help (or force in certain cases) configure the conditions for the decline (transformation, reemergence or dissolution).

Figure 1
Common development phases of regional innovation clusters



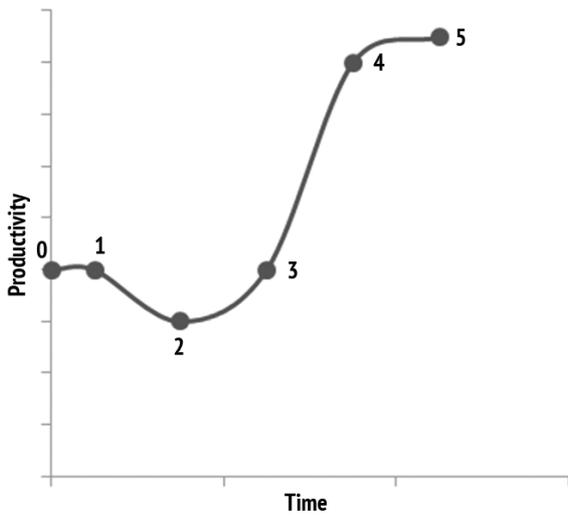
Source: Authoring

Figure 2
The team efficiency curve during the formation and development of the team



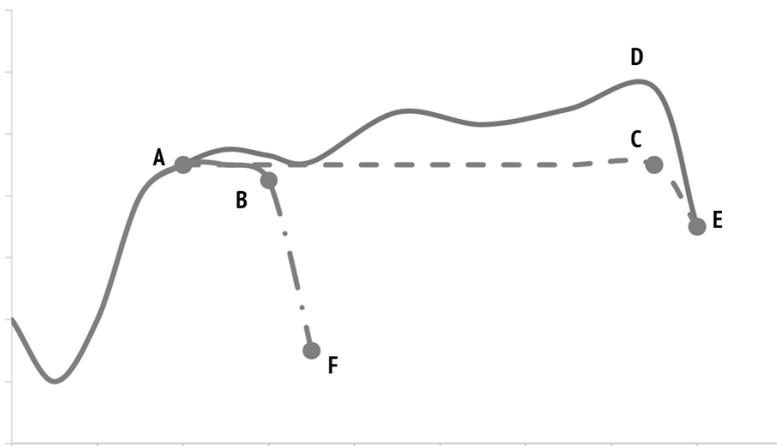
Source: Authoring

Figure 3
The cluster performance curve at the stage of formation and development



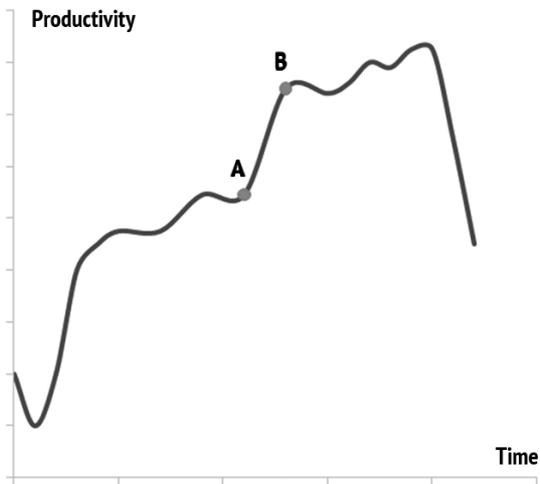
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Figure 4
Alternative maturity options for a regional innovation cluster



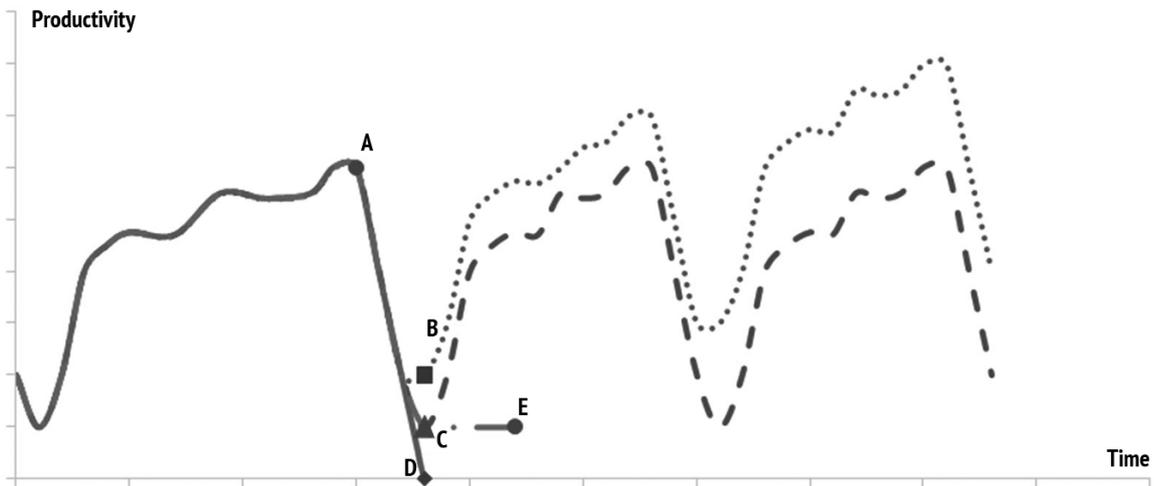
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Figure 5
Return to growth



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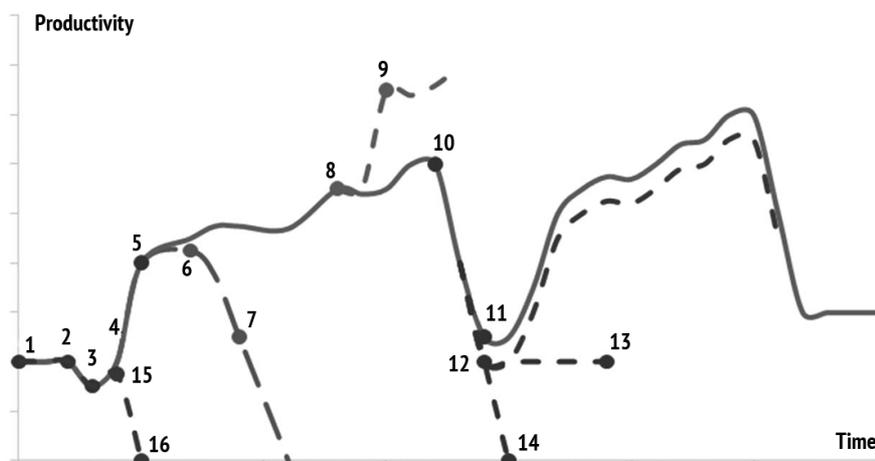
Figure 6
Restructuring of the regional innovation cluster



Source: Authoring

Figure 7

Evolutionary variability of the regional innovation cluster



Source: Authoring

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Conflict-of-interest notification

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.

Translated Article[†]

METHODOLOGICAL TECHNIQUES FOR EVALUATING THE EFFICIENCY OF PRIVATE INVESTMENT IN EDUCATION

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JEL classification: G11, J24**Keywords:** investment, education, human capital, productivity, potential income**Abstract****Subject** The article discusses the methodological approaches to evaluating the efficiency of private investment in human capital as a self-expanding value driver. I spotlight education as a crucial component of human capital, which is considered as the self-expanding value driven by an increase in the staff labor productivity, salaries. I also treat it as the property represented with professional qualities.**Objectives** The research aims to forge a technique for evaluating the cost effectiveness of investment in education as part of human capital investment by comparing income (average salaries at different levels of education) and training expenditures.**Methods** I determined the required rate of return on investment in education, considering the use of alternative manpower and finance.**Results** The rate of return is taken as equal tranches of additional income (annuity) throughout the entire employment period, including investment in education, and income lost for the period of training as alternative costs. Based on real indicators, I precisely measured the net return on investment in education at different levels.**Conclusions and Relevance** The technique allows to determine whether a person effectively utilizes labor and financial resources as investment in education. The technique can be applied to evaluate the efficiency of private investment and require rate of return on investment in education.

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Education should be viewed as an item of investment in human capital. The concept human capital stemmed from key criteria of capital, being the self-expanding value driven by an increase in the personal labor productivity, salary, and property represented with professional qualities.

As Adam Smith noted in *The Inquiry into the Nature and Causes of the Wealth of Nations* [1], the useful labor becomes more productive after the employee improves

his/her professional skills, with the subsequent technological upgrade of machines and tools. The renowned scholar treated investment as contributions to the human ability to earn in the future, likening them with the physical property, which are supposed to pay back within the employment life of a person [2].

Alfred Marshall suggested capitalizing net earnings in evaluating the human capital, emphasizing the similarity of investment in human capital and capital stock. Like A. Smith, A. Marshall advocated an economic approach to people, treating them as capital [3–6].

Drawing upon the concepts by A. Smith and D. Ricardo, K. Marx developed the theory of productive force

[†]For the source article, please refer to: *Букреев И.А. Методические подходы к оценке эффективности частного инвестирования в образование // Финансовая аналитика: проблемы и решения. – 2018. Т. 11. № 4. С. 387–400.*
URL: <https://doi.org/10.24891/fa.11.4.387>

reproduction, considering a man as the capital stock and emphasized that professional knowledge, productive skills and spare time were of paramount importance for the human development [5–8].

Th. Schulz was one of the trailblazers in human capital investment, introducing the notion and referring it to people's accumulation of professional knowledge, effective and productive performance for the public interest and health care.

Before the origination of the neoclassical theory of human capital, K. Marx qualified human capital investment as part of productive force reproduction costs. Th. Schulz echoed the idea stating that human capital can be accumulated and reproduced [9, 10].

L. Walras and J.R. McCullox proclaimed the human to be capital since they believed that personal skills and capabilities are inseparable of a person. Likewise, they mentioned the required rate of return on investment and time spent to get special training as the necessary rate at which wages shall be augmented [11, 12].

The concept and principles of the human capital theory are believed to have been introduced by the U.S. scholar Th. Schulz, while H. Becker [13] developed a microeconomic analysis method to study various aspects of human behavior and interactions. Th. Schulz evaluated human capital investment through the same categories as physical capital, considering expenditures on education and respective time.

G. Psacharopoulos, H.A. Patrinos [14], J.B. Mincer [15] and G.S. Becker, B.R. Chiswick [16] proposed approaches to measuring the return on human capital investment.

Types of human capital investment [17]:

- expenditure on education, including secondary school and vocational, formal and information training;
- healthcare expenditures made up of the preventative treatment, medical services, diet, better housing and living conditions;
- mobility expenditures people incurred to migrate from places with low productivity, wages and working conditions.

As K. Marx and T. Hodgskin note, human capability to work is the main wealth-generating asset generated as a result of the prior work. The issue of capabilities is considered as the public benefit.

From perspectives of personal benefit, human capital (productive force, constructive, namely intellectual, capabilities of a person, according to K. Marx) can really be accumulated, but not as the inert mass as compared with physical capital, but rather a living construct, being the art of a worker and degree of labor advancement [7, 8].

According to K. Marx, the developed productive force resolves itself into the complex spirit, though it can turn up as something simpler. The mere productive force, under no circumstance, cannot be embodied as a piece of complex work. The complexity and quality of work reflect the development of productive force, which concurrently unites the consumption and production of physical and intellectual capabilities [18, 19].

Nowadays, it is clear that human capital investment paves the way for the developed countries to technological advancement, making them more and more competitive. Furthermore, the cost effectiveness of investment in education depends on the development level of a specific country. It is necessary to keep track of education spending as precise as practicable and determine their effectiveness so to reduce gross labor costs in all areas of social reproduction.

It is not that easy to gauge the economic effect of investment in education from individual perspectives since the consumer lacks the information needed to assess possible benefits as appropriate..

G.S. Becker framed the concept of individual demand curve with respect to investment in education. The investment demand curve accounts for increasing physical and intellectual requirements, income lost during the training period, reduction in the income generation time in case of the closing stage investment, increased risk in case of greater investment. The researcher assessed the cost effectiveness of education by deducting earnings of those who continued their education after high school from lifetime earnings of those who graduated from colleges [20, 21].

According to international researches, there is a 60-percent correlation between the level of income and education (UNESCO data). In this respect, we can point out some trends¹:

- the remuneration of better education employees is higher than those with the lower educational level;

¹ EFA Global Monitoring Report, 12th edition.
URL: <http://unesdoc.unesco.org/images/0023/002325/232565R.pdf>

- remuneration grows as an employee gets older and more experienced;
- the better the educational background, the later a person reaches the maximum wage.

It is noteworthy that if it is an employee who decides on his/her educational needs, he/she should consider the tuition cost, earnings lost during studies and the interest rate. Private costs will include any direct expenses to be incurred by a person and income lost.

Investment in education and return on it are two processes distanced over time. Thus, they should be brought to the same moment to be compared. Net Present Value (NPV) is the difference between the discounted values of net present flows of benefits and costs. Investment in further education is feasible and reasonable if NPV is positive[21–24].

The following values are used to measure the economic effect of investment in education:

- 1) average remuneration of employees by competence and education (*Table 1*);
- 2) annual tuition fees and duration of full-time training by education level (*Table 1*);
- 3) refinance rate i and inflation rate T (*Table 2*);
- 4) average employment record upon retirement (it is 34.5 years in Russia. I use 30 years to simplify computations)².

There was a trend in Russia that more well educated employees are better paid than those with lower educational level. However, the trend has been declining for the recent years due to a lack of qualified workforce, but it is still considerable (*Table 1*).

In Russia, people of different educational background may earn quite similar income unlike the situation in advanced economies. However, the cost of education is too high from perspectives of the existing income levels.

As for the accounting rate, it is much higher than in advanced economies, thus making investment in education not very lucrative. *Table 2* presents the fluctuating refinance rate and inflation rate for 2008–2017.

As the computations show, for planning purposes, it is unreasonable to refer to the refinance rate and inflation

rate. To evaluate the efficiency of investment in education, indicators of the stable economic situation, which is recorded by the Central Bank of Russia, matter only.

The Central Bank accepts the equilibrium rate of interest as much as 6.5–7 percent per annum. It will settle in 2019. According to the Central Bank of Russia, the interest rate should be 2.5–3 points higher in case of a 4-percent stable inflation. Therefore, I use indicators of the stable economic development that are captured in case of a 4-percent inflation rate and 7-percent refinance rate.

Investment in education include tuition fees at different levels of professional training and income lost during the period of such training, which can be measured with the average salary a person might earn, having just secondary education.

Investment in education and possible income represented with the average salary of a person with secondary education take a certain moment of time within the period when a person attends a professional advancement course. Thus, the future fees should be taken into consideration. Benefits from such investment shall translate into higher income in the future, thus raising the future value of investment in education.

Costs of investment in education can be direct (tuition fees) and alternative (probable salary which a person without special professional training may earn). Additional income should be taken into account as equal parts as if the return on investment in education was generated part by part plus interests on their par value (*Table 3*).

As the computations show, different education background may possibly generate earnings of RUB 8,335 up to RUB 11,579 per month additionally to the average salary base.

The nominal value of the future average salary will equal RUB 30,351 in four years' time, without its real value being changed as per the compound interest formula and inflation rate for the period of stable economic development ($T = 7\%$). The future amount of tuition fees and salary (alternative costs) will constitute the cost of education in line with the average salary base for the given period (*Table 4–6*).

Unless the real value changes throughout the period, the nominal salary will range from RUB 30,351 to RUB 98,440. In such circumstances, the ratio of additional

² REGNUM. Average employment history upon retirement is 34.5 years in Russia. URL: <http://regnum.ru/news/1734236.html> (In Russ.)

potential earnings will reach the highest record within the time period, i.e. 0.38 to 0.12 (*Table 4*).

The ratio of additional potential earnings will range from 0.28 to 0.09 (*Table 5*).

The ratio of additional potential earnings will range from 0.27 to 0.08 (*Table 6*).

The real refinance rate $R_c(i) = 0.029$ should be used to describe the rate of return on investment in education. The real refinance rate help measure the real amount of additional earnings. I apply such values to demonstrate whether earnings are substantial (*Table 7*).

After computations are made in accordance with the real interest rate of monthly additional earnings, which represent the rate of return on investment in education, the real salary can be compared at different levels of educational background. The comparison refers to the secondary education level (*Table 8*).

Relying upon the given data, I can underline the positive net return on higher education only, amounting to RUB 13,154.4 per month. Under the real economic circumstances, there is frequent demand for qualified workforce, especially in utilities and servicing sectors. The value of such workers' services considerably exceeds the average indicator given in *Table 1* as compared with working time spent. In this case, the worker also acts as an entrepreneur, searching for orders on his/her own and considering payments for such services as his/her own income.

Analyzing *Table 9*, I conclude that the return on investment in education increases as the qualification

level is raised. Leadership positions generate the highest positive return. However, it is negative at the line level. Hence, the payback period of investment in education depends on the professional promotion dynamics or the period of working in a line position being as short as possible.

If education is treated as investment and likened to investment in capital stock, the proposed technique for efficiency evaluation from perspectives of an individual allows to understand the required rate of return on investment in different levels of education through the salary difference.

The computations herein are relevant since they help measure net earnings from different educational background as a whole and in particular, from perspectives of an individual as an economic entity.

K. Marx's theory describes the situation when capital migrate from one industry to the other until prices for goods ensure equal profit for equal capital held in different industries. The same approach works in the proposed technique to measure the required rate of return on investment in different levels of education.

Like a businessman gains abnormal return, pioneering a sector with the high rate of return on investment, an individual, who monitors the labor market demand, is also able to evaluate his/her investment in education with the proposed technique as an opportunity of net income, which is similar to abnormal return.

Furthermore, the technique can serve for the economic rationale for the offering of education services.

Table 1**The average salary of employees by occupation group and educational level in 2015, RUB**

Group	Education level			
	Higher	Secondary vocational education, mid-level specialist	Secondary vocational education, professionally skilled worker, white collar employee	Secondary education
Entire staff	43,362	26,929	27,128	25,944
Leaders	65,587	42,022	39,729	38,239
High qualification staff	39,056	28,345	28,983	33,099
Mid-level qualification staff	37,765	27,334	25,118	26,056
General workers (baseline level)	17,422	15,221	15,530	15,771
Tuition fees	72,000	59,000	56,000	–
Duration of training, years	4	3	3	–

Source: 2017 Chart Education: A Statistical Compendium. URL: <https://www.hse.ru/data/2017/05/29/1172124724/%D0%98%D0%BD%D0%B4%D0%B8%D0%BA%D0%B0%D1%82%D0%BE%D1%80%D1%8B%20%D0%BE%D0%B1%D1%80%D0%B0%D0%B7%D0%BE%D0%B2%D0%B0%D0%BD%D0%B8%D1%8F%202017.pdf> (In Russ.); The cost of higher education in the Universities of Moscow. Investing in the future. URL: <http://www.aif.ru/boostbook/stoimost-vysshego-obrazovanija.html> (In Russ.); Totals and Size Make Up the Basic Standard Costs for Cost Groups of Professions and Specialities for the Realization of the Basic Professional Education Programs Vocational-Training Programs Mid-level Professionals in 2015 Year for Institutions Subordinated to the Ministry of Education and Science of Russia. URL: <https://минобрнауки.рф/документы/5660> (In Russ.)

Table 2**Key macroeconomic indicators in 2008–2017, percent**

Year	Inflation rate in Russia per annum	Inflation, growth rate	Refinance rate range	Average refinance rate (ratio)
2017	1.03	0.02	7.75–9.75	0.08
2016	1.05	0.05	10–10.5	0.1
2015	1.13	0.13	11.5–15	0.13
2014	1.11	0.11	7–17	0.12
2013	1.06	0.06	5.5	0.06
2012	1.07	0.07	8.25	0.08
2011	1.06	0.06	8–8.25	0.08
2010	1.09	0.09	7.75–8.5	0.08
2009	1.09	0.09	8.75–12.5	0.11
2008	1.13	0.13	10.25–13	0.12

Source: Inflation on the Consumer Market. URL: http://www.cbr.ru/statistics/?Prtd=macro_sub (In Russ.); The Inflation Statement by the Central Bank. URL: <https://www.bfm.ru/news/339731>; Information about the CBR Refinancing Rate. URL: http://nalognalog.ru/spravochnaya_informaciya/informaciya_o_stavke_refinansirovaniya_cb_rf (In Russ.)

Table 3
Key indicators for computations in line with the nominal interest rate

Indicator	Formula	Higher education	Secondary vocational education, mid-level specialist	Secondary vocational education, professionally skilled worker, white collar employee
Cost of education (including alternative costs) as of the beginning of the period, FV	$FV = CF_0(1 + i)^n +$ $+ CF_1(1 + i)^{n-1} + \dots$ $+ CF_n(1 + i)^{n-n} =$ $= \sum CF_k(1 + i)^{n-k},$ where $CF_0 \dots CF_k$ mean money spent in different periods ($n - k$); i is the refinance rate	1,724,331.78	1,251,998.83	1,241,266.2
Future value of regular payment in the same monetary unit, a_n	$a_n = i\{1 - [1/(1+i)^n]\}$	0.081	0.081	0.081
Future potential income per year, Aa_n , RUB	$Aa_n = a_n \sum$, where \sum is the amount invested in education	138,957.7	100,894.08	100,029.18
Future potential income per month, RUB	$Aa_n / 12$	11,579.81	8,407.84	8,335.76

Source: Authoring

Table 4
Assessment of additional income as an alternative to higher education, RUB

Year	Nominal salary	Ratio of salary	Cost of education, including alternative costs, as of the beginning of the period	Interests per annum on funds equal to the cost of education	Accumulated funds in line with interests accrued	Amount as of the end of each year
1	30,351	0.38	1,724,331.8	120,703.2	1,845,035	1,706,077.3
2	32,827	0.35	1,706,077.3	119,425.4	1,825,502.7	1,686,545
3	34,141	0.34	1,686,545	118,058.2	1,804,603.2	1,665,645.5
4	35,506	0.33	1,665,645.5	116,595.2	1,782,240.7	1,643,283
5	36,926	0.31	1,643,283	115,029.8	1,758,312.8	1,619,355.1
6	38,403	0.3	1,619,355.1	113,354.9	1,732,709.9	1,593,752.2
7	39,940	0.29	1,593,752.2	111,562.7	1,705,314.9	1,566,357.2
8	41,537	0.28	1,566,357.2	109,645	1,676,002.2	1,537,044.5
9	43,199	0.27	1,537,044.5	107,593.1	1,644,637.6	1,505,679.9
10	44,927	0.26	1,505,679.9	105,397.6	1,611,077.5	1,472,119.8
11	46,724	0.25	1,472,119.8	103,048.4	1,575,168.2	1,436,210.5
12	48,593	0.24	1,436,210.5	100,534.7	1,536,745.2	1,397,787.5
13	50,536	0.23	1,397,787.5	97,845.1	1,495,632.7	1,356,675
14	52,558	0.22	1,356,675	94,967.2	1,451,642.2	1,312,684.5
15	54,660	0.21	1,312,684.5	91,887.9	1,404,572.5	1,265,614.8
16	56,846	0.2	1,265,614.8	88,593	1,354,207.8	1,215,250.1
17	59,120	0.2	1,215,250.1	85,067.5	1,300,317.6	1,161,359.9
18	61,485	0.19	1,161,359.9	81,295.2	1,242,655.1	1,103,697.4
19	63,945	0.18	1,103,697.4	77,258.8	1,180,956.2	1,041,998.5
20	66,502	0.17	1,041,998.5	72,939.9	1,114,938.4	975,980.7

21	69,162	0.17	975,980.7	68,318.7	1,044,299.4	905,341.7
22	71,929	0.16	905,341.7	63,373.9	968,715.6	829,757.9
23	74,806	0.15	829,757.9	58,083.1	887,840.9	748,883.2
24	77,798	0.15	748,883.2	52,421.8	801,305.1	662,347.4
25	80,910	0.14	662,347.4	46,364.3	708,711.7	569,754
26	84,147	0.14	569,754	39,882.8	609,636.8	470,679.1
27	87,513	0.13	470,679.1	32,947.5	503,626.6	364,668.9
28	91,013	0.13	364,668.9	25,526.8	390,195.7	251,238
29	94,654	0.12	251,238	17,586.7	268,824.7	129,867
30	98,440	0.12	129,867	9,090.7	138,957.7	0

* Additional potential income for the employment period amounts to RUB 138,957.7.

Source: Authoring

Table 5

Assessment of additional income as an alternative to secondary vocational training of a mid-level specialist, RUB^{*}

Year	Nominal salary	Percentage of the salary	The cost of education, including alternative costs, as of the beginning of the period	Interests per annum accrued on funds equal to the cost of education	Accumulation of the funds, including interests accrued	Funds as of the end of each year
1	30,351	0.28	1,251,998.8	87,639.9	1,339,638.7	1,238,744.7
2	32,827	0.26	1,238,744.7	86,712.1	1,325,456.8	1,224,562.7
3	34,141	0.25	1,224,562.7	85,719.4	1,310,282.1	1,209,388
4	35,506	0.24	1,209,388	84,657.2	1,294,045.2	1,193,151.1
5	36,926	0.23	1,193,151.1	83,520.6	1,276,671.7	1,175,777.6
6	38,403	0.22	1,175,777.6	82,304.4	1,258,082	1,158,187.9
7	39,940	0.21	1,157,187.9	81,003.2	1,238,191.1	1,137,297
8	41,537	0.2	1,137,297	79,610.8	1,216,907.8	1,116,013.7
9	43,199	0.19	1,116,013.7	78,121	1,194,134.7	1,093,240.6
10	44,927	0.19	1,093,240.6	76,526.8	1,169,767.4	1,068,873.3
11	46,724	0.18	1,068,873.3	74,821.1	1,143,694.5	1,042,800.4
12	48,593	0.17	1,042,800.4	72,996	1,115,796.4	1,014,902.3
13	50,536	0.17	1,014,902.3	71,043.2	1,085,945.5	985,051.4
14	52,558	0.16	985,051.4	68,953.6	1,054,005	953,110.9
15	54,660	0.15	953,110.9	66,717.8	1,019,828.7	918,934.6
16	56,846	0.15	918,934.6	64,325.4	983,260.1	882,366
17-й	59 120	0,14	882,366	61,765.6	944,131.6	843,237.5
18-й	61 485	0,14	843,237.5	59,026.6	902,264.1	801,370
19-й	63 945	0,13	801,370	56,095.9	857,465.9	756,571.9
20-й	66 502	0,13	756,571.9	52,960	809,531.9	708,637.8
21-й	69 162	0,12	708,637.8	49,604.6	758,242.5	657,348.4
22-й	71 929	0,12	657,348.4	46,014.4	703,362.8	602,468.7
23-й	74 806	0,11	602,468.7	42,172.8	644,641.5	543,747.4
24-й	77 798	0,11	543,747.4	38,062.3	581,809.7	480,915.6
25-й	80 910	0,1	480,915.6	33,664.1	514,579.7	413,685.7
26-й	84 147	0,1	413,685.7	28,958	442,643.7	341,749.6
27-й	87 513	0,1	341,749.6	23,922.5	365,672	264,778
28-й	91 013	0,09	264,778	18,534.5	283,312.4	182,418.3
29-й	94 654	0,09	182,418.3	12,769.3	195,187.6	94,293.5
30-й	98 440	0,09	94,293.5	6,600.5	100,894.1	0

* Additional potential income for the employment period amounts to RUB 100,894.1.

Source: Authoring

Table 6**Assessment of additional income as an alternative to secondary education of a professionally skilled worker, employee, RUB^{*}**

Year	Nominal salary	Percentage of salary	The cost of education, including alternative costs, as of the beginning of the period	Interests per annum accrued on funds equal to the cost of education	Accumulation of the funds, including interests accrued	Funds as of the end of each year
1	30,351	0.27	1,241,266.2	86,888.6	1,328,154.8	1,228,125.7
2	32,827	0.25	1,228,125.7	85,968.8	1,314,094.5	1,214,065.3
3	34,141	0.24	1,214,065.3	84,984.6	1,299,049.8	1,199,020.7
4	35,506	0.23	1,199,020.7	83,931.4	1,282,952.1	1,182,922.9
5	36,926	0.23	1,182,922.9	82,804.6	1,265,727.5	1,165,698.4
6	38,403	0.22	1 165,698.4	81,598.9	1,247,297.2	1,147,268.1
7	39,940	0.21	1 147,268.1	80,308.8	1,227,576.8	1,127,547.7
8	41,537	0.2	1,127,547.7	78,928.3	1,206,476	1,106,446.8
9	43,199	0.19	1,106,446.8	77,451.3	1,183,898.1	1,083,868.9
10	44,927	0.19	1,083,868.9	75,870.8	1,159,739.7	1,059,710.5
11	46,724	0.18	1,059,710.5	74,179.7	1,133,890.3	1,033,861.1
12	48,593	0.17	1,033,861.1	72,370.3	1,106,231.4	1,006,202.2
13	50,536	0.16	1,006,202.2	70,434.2	1,076,636.4	976,607.2
14	52,558	0.16	976,607.2	68,362.5	1,044,969.7	944,940.5
15	54,660	0.15	944,940.5	66,145.8	1,011,086.3	911,057.2
16	56,846	0.15	911,057.2	63,774	974,831.2	874,802
17	59,120	0.14	874,802	61,236.1	936,038.1	836,008.9
18	61,485	0.14	836,008.9	58,520.6	894,529.6	794,500.4
19	63,945	0.13	794,500.4	55,615	850,115.4	750,086.2
20	66,502	0.13	750,086.2	52,506	802,592.3	702,563.1
21	69,162	0.12	702,563.1	49,179.4	751,742.5	651,713.3
22	71,929	0.12	651,713.3	45,619.9	697,333.3	597,304.1
23	74,806	0.11	597,304.1	41,811.3	639,115.4	539,086.2
24	77,798	0.11	539,086.2	37,736	576,822.2	476,793
25	80,910	0.1	476,793	33,375.5	510,168.6	410,139.4
26	84,147	0.1	410,139.4	28,709.8	438,849.1	338,820
27	87,513	0.1	338,820	23,717.4	362,537.4	262,508.2
28	91,013	0.09	262,508.2	18,375.6	280,883.8	180,854.6
29	94,654	0.09	180,854.6	12,659.8	193,514.4	93,485.2
30	98,440	0.08	93,485.2	6,544	100,029.2	0

* Additional potential income for the employment period amounts to RUB 100,029.2.

Source: Authoring

Table 7

Key indicators for computations in line with the real interest rate

Indicators	Formula	Higher education	Secondary vocational education, mid-level specialist	Secondary vocational education, professionally skilled worker, white collar employee
Real interest rate, $R_c(i)$, %	$R_c(i) = (1 + I) / (1 + T) - 1$	0.029	0.029	0.029
Real future value of regular payments in the same monetary unit, a_{nr}	$a_{nr} = i / \{1 - [1 / (1 + I)^n]\}$	0.05	0.05	0.05
Future potential income per year, A_{anr} , RUB	$A_{anr} = a_{nr} \sum$, where r is a real value	86,667.09	62,927.04	62,387.6
Future potential income per month, RUB	$A_{anr} / 12$	7,222.26	5,243.92	5,198.97

Source: Authoring

Table 8

Return on investment in education, RUB

Indicator	Higher education		
	Higher	Secondary vocational education, mid-level specialist	Secondary vocational education, professionally skilled worker, white collar employee
Entire staff	50,727.41	31,503.12	31,735.92
Secondary education	30,350.81	30,350.81	30,350.81
Rate of return on investment in education *	7,222.2	5,243.92	5,198.23
Net income	13,154.4	-4,091.61	-3,813.12

* Rate of return on investment in education is the required present value of additional income an individual derives, including the real interest rate, in line with the time and cost of education.

Source: Authoring

Table 9**Benefits from investing in education by group, RUB**

Group	Education level			
	Higher	Secondary vocational education, mid-level specialist	Secondary vocational education, professionally skilled worker, white collar employee	Secondary education
Entire staff	50,727.41	31,503.12	31,735.92	30,350.81
Leaders	76,727.51	49,159.8	46,477.31	44,734.22
High qualification staff	456,900	33,159.64	339,061	38,721.15
Mid-level qualification staff	44,179.71	31,976.91	29,384.51	30,481.83
General workers (baseline level)	20,381.28	17,806.42	18,167.9	18,449.84
Tuition fees	7,222.2	5,243.92	5,198.23	-

Source: Authoring

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Conflict-of-interest notification

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Translated Article[†]**VAT REFORM AND TAXATION OF THE CONSTRUCTION SECTOR****Takhir G. DAVLETSHIN**OOO Burovye i Neftepromyslovye Nasosy (Oil-rig and oilfield pumps),
Kazan, Republic of Tatarstan, Russian Federation
shentmz@yandex.ru**Article history:**Received 26 November 2018
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Available online 29 March 2019**JEL classification:** H21, H25, H26, H30**Keywords:** general tax
regime, simplified taxation system,
tax harmonization, value added tax**Abstract****Subject** The article discusses the taxation specifics of entities in the construction sector, tax burden and financial results under various taxation treatment and costs, impact of tax law imperfections on financial results teetering on the edge of general and special tax treatment.**Objectives** The research aims to set an effective taxation system stimulating the economic growth, raising the revenue of the budgetary system, involve business entities operating in the construction sector into the scope of the applicable law.**Methods** The research applies general scientific approaches and methods.**Results** I examined the imperfection of VAT laws as the main cause of informal financial schemes used in the construction sector. Considering the estimated tax burden of construction entities and respective costs under different tax treatment, I point out that the general tax treatment implies the high tax burden. As small businesses opt for the simplified tax treatment, their production costs increase since VAT paid for resource acquisition is not refunded but charged to cost. Furthermore, being sold to entities subject to the general tax treatment, goods (work, services) of entities subject to the simplified tax treatment can be delivered at the price reduced by the VAT rate. This has a detrimental effect on financial results and engenders tax evading schemes.**Conclusions and Relevance** In the construction sector, entities have a high level of tax burden, which strongly depends on a tax treatment. This contravenes principles of equality, neutrality, fairness and proportionality of taxation. There should be new fiscal treatment mechanisms to fit the construction specifics.

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*The editor-in-charge of this article was Irina M. Vechkanova**Authorized translation by Irina M. Vechkanova*

The construction sector is an inseparable and crucial constituent of the national economy. It accounts for about 5.7 percent of GDP. The construction sector involves investors, property owners/developers, project entities, construction and mounting entities, entities operating in the construction materials segment, transportation businesses. The construction sector embraces a variety of businesses by size, ownership form and legal structure, existing all over the world.

The construction companies produces goods (work, services) for a specific order. Therefore, each new product is a result of special research, work of many participants, including new ones. This requires a robust professional, technical and technological background.

Tax laws are an important regulatory constituent of the construction sector.

What poses a crucial challenge to entrepreneurship is the imperfection of Chapter 21 of the Russian Tax Code, *Value Added Tax*, unharmonized tax regimes – general and special tax treatment [1, 2], being one of key causes of tax evasion. The imperfect tax legislation triggers a

[†]For the source article, please refer to: *Давлетшин Т.Г.*Реформирование НДС и налогообложение строительной отрасли // Финансы и кредит. 2019. Т. 25. № 2. С. 458–479.
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lot of tax disputes and abuses. According to law enforcement authorities, unlawful refund of VAT and informal financial schemes become one of the most frequent wrongdoings in the construction sector in pursuit of tax evasion.

Despite distinctions of construction business, such as geographical dispersedness of construction sites, protracted preparation (project development, obtaining permits and licenses, etc.), multiple steps of payments and settlements between parties to construction projects, diversity of business and legal forms and applicable tax regimes, common practice of temporary employment, including migrant workers from other regions and countries, the Russian Tax Code fails to envisage a special tax regime for construction, which would accommodate for its distinctive features as much as possible, like it provides for the single agricultural tax. As a matter of fact, construction entities are not provided with tax benefits. Construction companies are eligible for the only tax benefit, which is performed by not charging VAT on services of developers acting under construction co-funding contracts.

Key Taxes and Tax Treatment in Construction

Value Added Tax (VAT), personal income tax, income tax and social security charges make 90 percent of taxes and levies applicable to the construction sector (*Table 1*). Despite multiple small businesses and applicability of special tax treatment, special tax treatment system account for a small share in total fiscal revenue (2.8 percent).

Basically, the overall tax burden of the construction sector is low, being 14.6 percent of fiscal revenue including personal income tax, VAT and social security charges. In 2017, all entities operating in construction had a turnover of RUB 6,796.2 billion¹.

However, considering the applicable laws, the potential tax burden of a typical entity in the constructions sector is estimated to be much higher, reaching 25 percent on average. Having examined business operations of construction companies, I also admit the substantial

scale of tax burden of the construction sector². As 34 percent of corporate leaders report, construction companies are constrained with high taxes, which prevail in comparison with other factors, such as a lack of orders, expensive materials, facilities, products (each 29 percent) insolvency of customers (27 percent). Hence, statistical data on the construction sector do not presumably give a true view of the tax burden of constructions companies operating under the tax laws. This may be due to the fact that there exist special tax regimes (they generate about 2.8 percent of tax revenue) and businesses evade taxes through fly-by-night companies.

As per the effective tax laws, construction companies and entrepreneurs can choose the general tax treatment, simplified tax treatment, uniform tax on imputed income or patent-based simplified tax treatment.

In addition to the general tax treatment, many construction companies apply the simplified tax treatment. The simplified tax treatment is preferable for those businesses that sell their goods (work, services) to entities subject to special tax regimes and individuals. As per paragraph 2, Article 346.11 of the Russian Tax Code, entities subject to the simplified tax treatment are exempt from corporate income tax, property tax and uniform social tax. Furthermore, they do not pay VAT, except for tax charged on exports under the tax laws when goods cross the customs border of the Russian Federation. To be eligible to the simplified tax treatment, legal entities or sole proprietors shall comply with certain requirements. First of all, their threshold of income generated for a fiscal period (year) shall not exceed RUB 150 million (paragraph 4, Article 346.13 of the Russian Tax Code).

Special tax regimes, such as uniform tax on imputed income and patent-based simplified tax treatment, are more suitable for those businesses that sell their goods (work, services) solely to individuals for personal, family, household and other needs, other than business. Article 346.26 and Article 346.43 of the Russian Tax Code specifies types of services which are eligible to the above special tax regimes. They include consumer services classified in accordance with the Russian Classifier of Services for the Population OK 002-03 (OKUN) as approved by Resolution of the State

² Ibid.

¹ Construction Complex of the Russian Federation in 2017. A FSSS RF Statistical Book. URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/building/ (In Russ.)

Committee on Standards of Russia of June 28, 1993 № 163.

As per paragraphs 1 and 6 of the Rules for Consumer Services Provided to the Population of the Russian Federation as approved by Resolution of the RF Government of August 15, 1997 № 1025, consumer services are provided to an individual who orders or uses the services solely for personal, family, household and other needs, other than business.

On November 15, 2018, the State Duma of the Russian Federation adopted the Law, *On the Experiment of Setting the Special Tax Regime – Professional Income Tax*, which people call the self-employment law. The law entered into force on January 2019. Professional income tax will be applicable to citizens who work without being registered as sole proprietors. The self-employed category includes everyone who works individually, without hiring workforce, and earns less than RUB 200,000 a month. These people will be eligible to the preferential tax rate of 4 percent of their income (if their customers are individuals) or 6 percent (if their customers are sole proprietors or legal entities).

The law should be additionally elaborated since the personal income tax is not harmonized with other tax regimes, which may catalyze the chaotic reaction in the construction sector. Like the uniform tax on imputed income and patent-based tax system, in the construction sector, the self-employed shall be allowed to provide consumer services only which are rendered to individuals who order or use the services solely for personal, family, household and other needs, other than business.

Special tax regimes turn up to be more beneficial than the general tax treatment only if businesses sell goods (work, services) to ultimate consumers and/or buyers which are subject to any special tax treatment too. If they trade with entities subject to the general tax treatment, the effect will be opposite [3, 4].

Agents of Construction Activities

According to the Russian State Statistics Service, as of January 1, 2017, there were 271.6 thousand construction companies operating in the Russian market. Totally, in 2017, they delivered construction services worth RUB 7 545,9 billion (in 2016 – RUB 7,204.2 billion).

In 2017, the average headcount of workers in the construction sector decreased by 2.5 percent year-on-year, i.e. 2.4 billion people, or 5.5 percent of total people employed in the economy.

There were 9.5 thousand large and medium-sized enterprises in the sector, i.e. 3.5 percent of all construction companies. Large and medium-sized enterprises delivered services worth RUB 2,706.5 billion, i.e. 35.9 percent of all services (in 2016 – RUB 2,708.7 billion, 37.6 percent respectively). Large construction companies provided 30.2 percent of total work performed in construction, while medium-sized companies delivered 7.2 percent of services.

There were 262.1 thousand entities qualified as small entrepreneurs in the construction sector – 21.5 thousand small businesses (7.9 percent of all construction companies), 240.6 thousand micro-businesses (88.6 percent of all construction companies).

Small businesses, other than micro-businesses, accomplished construction services worth RUB 3,060 billion (in 2016 – RUB 1,816.8 billion, with the difference arising from reclassification of small and medium-sized businesses). They accounted for 40.6 percent of construction work delivered (in 2016 – 25.2 percent).

Hence, micro-businesses, population, temporary teams of builders, i.e. non-incorporated entities, performed the work worth RUB 1,779.4 billion, i.e. 23.5 percent of all construction work (in 2017 – RUB 2,680 billion, i.e. 37.2 percent respectively).

Construction companies are mostly private, delivering 90 percent of total services in construction.

In 2017, the total work performed by all construction companies amounted to RUB 7,545.9 billion, which is lower than in 2016 by 1.4 percent in comparable values (*Table 2*).

Turnover of companies rendering construction services as their core activities, excluding financial institutions, reached RUB 6,796.2 billion.

Gross added value of products in the construction sector amounts to RUB 5,286.6 billion, i.e. 5.7 percent of total Gross Domestic Product in 2017 like was in 2016.

In 2017, the financial result of profitable entities exceeded that of unprofitable ones by RUB 135.6 billion. In 2016, the gap was RUB 39.8 billion.

In 2017, investment in capital stock of large and medium-sized businesses amounted to RUB 281.7 billion for the development of construction activities, i.e. 2.3 percent of total capital investment throughout the Russian economy.

At the end of 2017, the carrying amount of fixed assets was RUB 1,741.5 billion in the construction sector, or 0.9 percent of value of fixed assets employed for all types of economic activities.

In Construction, the ratio of new fixed assets to closing fixed assets, which is assessed in comparable values, was 3.4 percent in 2017, demonstrating a drop of 2.6 percentage points year-on-year. At the end of 2017, wear and tear of fixed assets in construction increased by 1.3 percentage points year-on-year, reaching 49.7 percent.

The profitability of goods, products (work, services) and assets in construction is 7.2 percent and 1.8 percent respectively.

Tax Burden

Many researches scrutinize the taxation in the construction sector. The tax burden is assessed to range from 10 percent to 45 percent³ [5]. The estimated range of tax burden results from the use of different tax burden assessment techniques, applicable taxes and levies. The following differences of assessment techniques can be pointed out. Are personal income tax and indirect taxes included into the tax burden assessment? Which metrics are they compared with – turnover (revenue) including or net of VAT, or Value Added? [6, 7].

According to estimates of the Russian Ministry of Finance, the construction sector's tax burden accounts for 10.2 percent. It additionally assesses social security charges as much as 4.3 percent for reference (2017)⁴. The tax burden assessment technique of the Russian Ministry of Finance excludes social security charges, indicating them in charts for reference.

The website of the Russian Ministry of Finance presents reports and statements on taxes randomly. For

³ Nikulina O.M. [Tax burden in Russia: Basic approaches]. *Finansy i kredit = Finance and Credit*, 2016, vol. 22, iss. 17, pp. 13–27. URL: <https://cyberleninka.ru/article/n/nalogovaya-nagruzka-v-rossii-osnovnyye-podhody> (In Russ.)

⁴ The FTS of Russia. Tax burden by type of economic activity in 2017. URL: <https://www.nalog.ru/html/sites/www.new.nalog.ru/docs/kont/indicators17.xlsx> (In Russ.)

example, taxes embedded into the cost, profit, indirect taxes are grouped by their fiscal value and/or budgetary level, rather their economic substance⁵.

Consequently, the technique of the Russian Ministry of Finance assesses the real tax burden inaccurately and inadequately, distorting it through its departmental vision. It fails to take into account customs duties, social security charges accrued, though they are posted to cost. In the mean time, estimating the tax burden, the Ministry of Finance includes the personal income tax, which the entity withholds as a tax agent (the amount is included into the cost as part of salaries and wages) and indirect VAT, which the ultimate buyer pays, is not attributed to corporate production costs. Moreover, as per Letters of the Russian Ministry of Finance of January 11, 2017 № 03-01-15/208 and Letter of the Federal Tax Service of Russia of March 22, 2013 № ЕД-3-3/1026@, VAT on imports and customs duties are no longer accounted to estimate the tax burden. As the Russian Ministry of Finance explains it, the amounts are remitted to the Federal Customs Service directly.

Consequently, this gives an inadequate view of the tax burden borne by the construction sector. Based on data of the Federal Tax Service of the Russian Federation and Federal State Statistics Service of the Russian Federation, *Table 3* groups taxes so as to indicate their sources and economic substance. i.e. income tax, taxes attributable to profit before tax, taxes included into production costs and selling costs, charges and contributions to the Pension Fund of the Russian Federation, Social Security Fund, Fund of Compulsory Medical Insurance, taxes under special tax regimes, personal income tax (tax agent), indirect tax (VAT).

Taxes and levies indicative of tax burden evidently include the income tax, taxes included into production costs and selling costs, taxes attributable to profit before tax, social security charges and other statutory charges.

The ratio of total taxes (Line 7 *Table 3*) to turnover of construction entities (2017 – RUB 6,796.2 billion, according to the Federal State Statistics Service) was as follows:

$$178.9 / 6,796.2 \cdot 100\% = 2.63\%.$$

⁵ Davletshin T.G. [Reform of VAT and the unified agricultural tax]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 9, pp. 515–531. (In Russ.) URL: <https://doi.org/10.24891/df.23.9.515>

The ratio of social security charges (Line 8 *Table 3*) to revenue for FY 2017 is as follows:

$$295.3 / 6,796.2 \cdot 100\% = 4.35\%.$$

Total taxes and social security charges virtually constitute tax burden accounting to 6.98 percent. Technically, this amount just reflects the tax burden borne by entities in the construction sector⁶.

Supposedly, personal income tax and indirect taxes (VAT and excise taxes) should not be taken into consideration to estimate tax burden since the entity pays personal income tax out of employees' money, rather than its own one (acting as a tax agent). Ultimate buyers are those who actually pay indirect taxes (VAT and excise taxes), while entities virtually act as tax agents. To make a comprehensive evaluation of financial and business performance, it is reasonable to report personal income tax and VAT for reference only⁷:

tax burden is 6.98%;

personal income tax is $162.9 / 6,796.2 \cdot 100\% = 2.4\%$;

VAT is $353.2 / 6,796.2 \cdot 100\% = 5.2\%$.

If VAT and personal income tax are included, tax burden accounts for 14.6 percent.

Analyzing *Table 3* and data of the Federal State Statistics Service, I make the following conclusions.

1. VAT makes more than a half of taxes paid by the construction sector, net of social security charges. This is due to the fact that tax benefits for VAT are insignificant, construction sector serves the domestic market (products subject to zero interest rate are very scarce), and investment level is low (tax deductions for investing are insignificant).
2. Despite the proclaimed counteraction to tax evasion, informal tax optimization schemes, implementation of automated VAT control systems, tax authorities failed to collect more taxes from the construction sector. Tax burden has not risen for the recent years.

⁶ Panskov V.G. *Nalogi i nalogooblozhenie: teoriya i praktika. 5-e izd* [Taxes and taxation: theory and practice. 5th edition]. Moscow, Yurait Publ., 2016, 336 p.; Davletshin T.G. [Reforming the Russian Tax System: Problems and solutions]. *Finansy i kredit = Finance and Credit*, 2018, vol. 24, iss. 2, pp. 465–488. (In Russ.)
URL: <https://doi.org/10.24891/fc.24.2.465>

⁷ Davletshin T.G. [Reform of VAT and the unified agricultural tax]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 9, pp. 515–531. (In Russ.) URL: <https://doi.org/10.24891/fc.23.9.515>

Moreover, the construction sector's share in total taxes and levies shrank, not exceeding 5 percent

3. According to the Federal State Statistics Service, scarce investment results from the widely spread application of special tax regimes and existence of non-incorporated businesses. Fixed assets are registered as the property of business owners and executives. This reduced the property tax and motor vehicle tax.

Work Completed as Part of Construction Activities

To accurately estimate the tax burden, it is also important to determine what taxes paid corresponds with, whether it be turnover of construction companies or the work completed as part of construction activities. The Federal Tax Service (FTS) of the Russian Federation monitors its fiscal revenue from the construction sector through reports submitted by entities whose core activity is construction but also derive income from activities, other than construction. It is impossible to extract a percentage of taxes remitted from construction activities. However, considering that general types of business bear more or less the same tax burden, we can tentatively measure the overall tax burden by dividing the amount of taxes paid by turnover of entities. In the mean time, construction activities may be also performed by entities that do not specialize in construction as their core activity. According to the Federal State Statistics Service, in 2017, the volume of work completed in construction amounted to RUB 7,545.9 billion, and turnover of construction companies was RUB 6,796.2 billion. Thus, the real revenue from construction correlates with statistical data.

Work completed with internal resources of companies as part of construction activity is determined by the cost of work and construction services delivered under construction contracts and (or) contracts concluded with customers, work performed through economic management of companies and population in accordance with the methodology of the Federal State Statistics Service of the Russian Federation⁸.

⁸ *Ob"em vypolnennykh rabot po vidu ekonomicheskoi deyatel'nosti "Stroitel'stvo"* [The volume of work completed by economic activity of Construction].

URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/building/ (In Russ.)

According to the data of the Federal State Statistics Service of the Russian Federation for 2013, about 71 percent of construction work were performed by large, medium-sized and small entities, i.e. taxpayers with the satisfactory and streamlined accounting process. The above entities are mainly subject to the general taxation treatment, being the principle taxpayers (*Table 1*).

Micro-businesses performed 11 percent of construction works. Micro-businesses are mainly represented with legal entities and sole proprietors subject to the simplified tax treatment. Besides, about 18 percent of construction work for individuals which is performed by other individuals and temporary non-incorporated groups of workers. Such work cannot

Hence, about 30 percent of total construction work are in fact taxable, and the tax burden of law-abiding taxpayers is 1.5 times as high as average indicators of the Russian Ministry of Finance: $14.5\% \cdot 1.5 = 21.75\%$. Similar estimation of the tax burden results from tax assessment of an average entity operating in the construction sector in compliance with the tax laws.

The Potential Tax Burden of Construction Companies

Fig. 1 indicates the price for products, breakdown of production costs and profit reported by four types of construction companies, i.e. the first group with low value added (1), the second and third group with the medium value added (2) and above average (3), the four group with high value added (4).

The first group can be attributed to master contractors, the second and third ones are represented with entities performing construction and mounting work with their own resources, and the fourth group accomplishes construction and mounting work at the expense of the customer.

Table 4 shows the assessment of tax to be paid and profit under the general and simplified tax treatment in an equivalent operating environment. The assessment is based on the assumption of an equal share of tangible costs within the cost of products (work, services), salaries and tax regimes – general and simplified tax treatment. In the case of the simplified

tax treatment, tax was assessed when products (work, services) are sold to ultimate consumers, when the price equals the selling price asked by entities subject to the general tax treatment, i.e. 118 points (in the numerator), and to customers subject to the general tax treatment, when the sell price is less by the amount of VAT, i.e. 100 points (in the denominator). Expenses of an entity subject to the simplified tax treatment increase by input VAT and decrease as expenses on social security charges drop given salaries are equal (the tax benefit was abolished on January 1, 2019). Under the simplified tax treatment, profit is n -fold greater if products are sold to ultimate buyers, and, on the contrary, it is n -fold less or negative if the customer is an entity subject to the general tax treatment.

As estimated show, the tax burden of a construction entity subject to the general tax treatment accounts for 20 – 30 percent and more, while entities subject to the simplified tax treatment bear a 12–15 percent tax burden.

A decrease in the tax burden under the simplified tax treatment may also turn to be tricky. If the sell price is cut by 18 percent for entities subject to the general tax treatment, financial results will fall dramatically (Line Profit before Tax) [3].

The third and fourth groups bear the substantial tax burden as they have high value added in prices for work and services, which is salaries and contributions in construction (*Table 4*). The groups include all small and micro-business (numerous) delivering construction and mounting services with their own resources or at the expense of the customer. The amount of taxes payable approximates the payroll fund of the group.

Starting from January 1, 2019, in the construction sector, small entities subject to the simplified tax treatment faced more tough operating conditions.

1. VAT grew by 2 points up to 20 percent, thus increasing the cost for purchase of materials by 1 – 1.5 percent of the sell price, while the sell price is 20 percent as low as entities subject to the general tax treatment (the previous difference is 18 percent);
2. The abolition of a 20-percent benefit on social security charges will increase costs approximately by 5 percent.

The Impact of Tax Regime on Financial Results (Simplified Tax Treatment vs General Tax Treatment)

Financial results depend both on costs, tax rates and tax treatment systems applied to the entity and buyers (customers) of products (work, services) [3].

Fig. 2 depicts four lines of changes in the entity's profitability, which would be 20 percent, 15 percent, 10 percent and 5 percent if the entity subject to the general tax treatment opts for the simplified tax treatment, depending on a percentage of tangible costs for VAT embedded in the price for goods (work, services).

As the graph shows, the profitability of an entity subject to the simplified tax treatment is 1.5 times higher provided that the entity incurs an ordinary amount of tangible costs for VAT, which is about 50 percent. In case the entity subject to the simplified tax treatment has no tangible costs for VAT, its profitability is much higher than that of the entity subject to the general tax treatment.

Fig. 2 shows the profitability of the entity subject to the simplified tax treatment in comparison with the entity subject to the general tax treatment, depending on a percentage of tangible costs for VAT embedded in the sell price for goods (work, services) given the entity subject to the general tax treatment is a customer.

Fig. 3 displays four lines reflecting how the profitability of the entity falls under the simplified tax treatment, though it could have a 20 percent, 15 percent, 10 percent and 5 percent profitability under the general tax treatment (lines 1, 2, 3, and 4 respectively), depending on a percentage of tangible costs for VAT embedded in the price for goods (work, services). Considering that the average profitability in the construction industry is about seven percent, the transition to the simplified tax treatment shall mean a guaranteed unprofitableness of the company. In addition, the cost of acquiring material resources by small enterprises is, as a rule, higher than the cost of large ones, due to the absence or insignificance of wholesale discounts, and qualified accounting maintenance (which is relatively expensive). Small enterprises in construction are not competitive when using the general tax treatment. The transition to the

simplified tax treatment shall sharply worsen their financial results if the products (work, services) are not sold to the end consumers [3].

Thus, under the existing tax system, the development of SMEs in the Construction industry without violating tax legislation is impossible⁹. Strengthening of control (Automated VAT Control Systems) and growth of VAT rate without harmonization of the general system of taxation and special tax regimes can make SMEs not only linger behind the scene, but also cause a significant decline of business activities of small business in the industry and significant increases in construction prices [8–12]. As a result, the cumulative effect with regard to social consequences may be negative instead of the expected increase in income to the budget.

Tax Evasion Schemes in Construction

According to the calculations, the tax burden of the construction company subject to the general tax treatment, which performs the construction and installation operations using its own resources and operating within the framework of the tax legislation, is 20 to 30 percent and above, and in the case of the simplified tax treatment, it is 12 to 15 percent.

It is obvious, that having the two tax systems, i.e. VAT included and VAT excluded, with a great difference at the taxation level, as well as the ability to conduct construction activities through a *sham company* (i.e. with no registration), someone shall be tempted to choose a "favorable" tax treatment and grab the difference in taxes¹⁰. For this purpose, the so-called *straw companies* are set up, the purpose of which is to be a link between the real company optimizing the tax burden, and the sham company. In this way, a number of intermediaries gets formed, where the real taxpayer does not conclude contracts with a sham company directly. Unlike the sham company, a straw company, as a rule, has an office, a real founder and director, reports to the FTS and pays minimal taxes to avoid getting into the field of view of the tax service. Formally, they do not violate the law, so it is extremely difficult to fight them. If the case comes to trial, the court takes the taxpayer's side, as a rule, because it is very difficult to prove

⁹ Davletshin T.G. [Reforming Chapter 21 of the Russian Tax Code: From VAT to GST]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 32, pp. 1930–1943. (In Russ.)
URL: <https://doi.org/10.24891/fc.23.32.1930>

¹⁰ Ibid.

criminal design. Despite the fact that the Automated VAT Control System operates well, the problem still remains. Sham companies become “high-rise” ones, increasing the cost of cash-out transactions. Now, it is about 12 to 14 percent, while ten years ago it was one to two percent.

According to the Bank of Russia, the Construction industry is the leader among consumers of shadow financial services, it accounts for 30 percent of the market of cash-out transactions through banks¹¹. As the shadow financial services, the Bank of Russia considers “operations aimed at the eventual cashing-out of funds or their withdrawal abroad on fictitious grounds in order to avoid taxes, money laundering and corrupt purposes”.

According to the Bank of Russia Deputy Director D. Skobelkin, the rates for cash-out withdrawals through banks have risen from three percent in 2013 to 17 percent at present, and there are many various cash-out schemes engaged beyond the banking sector through trade networks, markets, and large network shops.

If we consider that the level of taxation of the construction organization subject to the general tax treatment, which performs the construction and installation operations using its own resources, is about 25 percent of the revenue and more, the scheme is attractive, besides, as a rule, cashing-out is not more than 40 to 60 percent of the cost estimate. Some businessmen cash out 100 percent of the cost estimate, not worrying of the content of accounting, payment of taxes, etc.

By illegal cashing-out, the taxpayer avoids the following:

- the obligation to pay the personal income tax as a tax agent;
- paying contributions to social funds;
- VAT paid on the wage part of expenses and social funds, profit and depreciation;
- VAT payable in accordance with paragraph 5 of Article 173 of the Russian Tax Code, on purchased goods

¹¹ *Sektory ekonomiki, formirovavshie spros na tenevye finansovye uslugi v pervom polugodii 2018* [Sectors of the economy that formed the demand for shadow financial services in the first half of 2018]. URL: http://www.cbr.ru/Collection/Collection/File/9391/sectors_2018_1.pdf (In Russ.)

(work, services) from enterprises using special taxation regimes.

In addition, the profit tax gets optimized.

Thus, the tax burden gets reduced to acceptable values of 10 to 15 percent. Sham companies help shady dealers keep the rest money.

Let us consider the real case of quantitative effects of cashing-out for the enterprise that has 30-percent material expenses including VAT, 50-percent wage and assignment to funds, sundry expenses, and ten-percent profit before tax (Group of enterprises 3 in *Fig. 1*, the company performs the construction and installation operations using its own resources). The amount of taxes would have amounted to RUB 33.9 (*Table 4*).

Transferring RUB 40 out of RUB 100 revenue (VAT included: $\text{RUB } 40 \cdot 1.18$) to the straw company for “subcontracting” (the need for cashing-out for the operating organization is about this amount, the sundry expenses like materials, electricity, some services, as a rule, include VAT), at 12.5-percent cashing-out rate, the taxpayer shall lose $\text{RUB } 40 \cdot 1.18 \cdot 12.5\% = 5.9$, and get $\text{RUB } 40 \cdot 1.18 - 5.9 = 41.3$. However, one should not think that this money gets siphoned off completely. These amounts include wages (mainly, off-the-books wages), some part of the materials and costs, profits of business owners, and kickbacks, etc.

The cost (wage part) 40-percent cashing-out would move up this enterprise into Group 1 (general contracting organizations), with RUB 13.5 taxes. Taking into account the cashing-out cost, the total “costs” will be RUB 19.4. Thus, due to this tax optimization scheme, the gain will be RUB 14.5.

As a rule, such an enterprise will not attract the attention of the tax service, as the tax burden is within the planned figures of the industry.

When cashing out 100 percent of the cost of the executed works (that implies the performance of works through the money-washing company by unincorporated enterprises), at 12.5-percent cashing-out rate, the cost of services will amount to $\text{RUB } 118 \cdot 12.5\% = 14.75$. The “saving” for the cashing-out scheme will be $\text{RUB } 33.9 - 14.75 = 19.15$, and there is no need to keep any accounts office.

It is evident, that organizations operating within the framework of tax legislation (the profitability in the

industry was 7.2 percent in 2017) are not able to compete with organizations that use such schemes. If control increases, they will have to be liquidated.

Despite the optimistic statements of officials about the increase in tax revenues, there have been no drastic changes in the Construction industry (Table 3), the tax burden has even decreased slightly since 2011, and the percentage of the Construction industry in the total volume of taxes and charges income to the budget of the country is at the level of 4.8. At the same time, there is a significant increase in the indebtedness of enterprises, including those at the stage of bankruptcy¹².

There is a false opinion, according to which the reduction of the VAT rate to 10 to 12 percent will make the cashing-out issue irrelevant. The above calculations show that cashing-out makes sense not only at the VAT rate of 10 to 12 percent, but even if the VAT is missing at all. The phenomenon will still remain, the cashing-out cost will decrease a few, but the VAT income in the budget will decrease appreciably.

The vitality of the shadow financial schemes lies in the peculiarities of conducting the construction business. They contribute to the use of various tax evasion schemes.

They include the territorial fragmentation of construction objects, multi-stage mutual settlements of construction subjects, frequent change of business partners, variety of organizational and legal forms of enterprises and their applicable tax regimes, the widespread use of temporary labor, including labor migrants from other regions and countries. For example, one construction site can have contractors from different cities, materials can be brought from other regions, migrant workers from other countries can perform construction work, and the very construction can be financed from another region or another country. Tax services cannot control the construction because there is no local organization. Often, when building even a large object, just symbolic sums of money go into the budgets of the city and/or region.

¹² *Reitingovoe agentstvo stroitel'nogo kompleksa. Analiz nalogooblozheniya v stroitel'noi otrasli* [Rating Agency of the Construction Complex. An analysis of taxation in the Construction industry]. URL: <https://rask.ru/news/analiz-nalogooblozheniya-v-stroitel'noy-otrasli/> (In Russ.)

The complexity of fighting the shadow business in the Construction industry is that the existing tax regimes imply a high tax burden on micro-enterprises, which are hundreds of thousands, and the tax administration of which is ineffective due to the peculiarities of the construction business. Also, the high level of taxation, which reaches half of the revenue, is inconsistent with the principles of fairness and proportionality and cannot be accepted by taxpayers¹³.

Builders conduct their activities in harsh climatic conditions, outdoors, often working on a rotation basis away from home. The wage in the Construction industry is lower than the average one in the economy as a whole.

Excessive control under the imperfection of the legislation leads and has already led to the fall of entrepreneurial activity, although the tax service “does not notice” millions of entrepreneurs who work without registration. It may be necessary to revive the institution of Tax Police, abolished in 2003¹⁴.

This analysis shows that there are no simple ways and methods of combating tax evasion in the Construction industry. It is necessary to reform the tax system, introduce new taxes and/or tax regimes, taking into account the peculiarities of construction activities and tax-controlled.

Reforming VAT and Harmonizing Tax Regimes

The introduction of special tax regimes into the Russian tax system and their widespread distribution have led to the fact that there are two tax systems operating *de facto* in the country in parallel: including VAT and VAT free¹⁵. There is no tax regime harmonization, which should tie together radically different tax regimes [1].

According to the results of the St. Petersburg International Economic Forum – 2015, held on June 18–20,

¹³ Panskov V.G. *Nalogi i nalogooblozhenie: teoriya i praktika. 5-e izd* [Taxes and taxation: theory and practice. 5th edition]. Moscow, Yurait Publ., 2016, 336 p.

¹⁴ Davletshin T.G. [Reforming the Russian Tax System: Problems and solutions]. *Finansy i kredit = Finance and Credit*, 2018, vol. 24, iss. 2, pp. 465–488. (In Russ.) URL: <https://doi.org/10.24891/fc.24.2.465>

¹⁵ Davletshin T.G. [Reforming the Russian Tax System: Problems and solutions]. *Finansy i kredit = Finance and Credit*, 2018, vol. 24, iss. 2, pp. 465–488. (In Russ.) URL: <https://doi.org/10.24891/fc.24.2.465>; Davletshin T.G. [Reforming Chapter 21 of the Russian Tax Code: From VAT to GST]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 32, pp. 1930–1943. (In Russ.) URL: <https://doi.org/10.24891/fc.23.32.1930>

2015, President Vladimir Putin instructed the responsible authorities to consider the issue and submit proposals for amending the legislation aimed at embedding taxpayers applying special tax regimes to the chain of VAT payers in order to ensure their unhindered participation in economic relations with taxpayers recognized as VAT taxpayers¹⁶. September 1, 2015 was the deadline. However, nothing has been done in this area.

VAT reform, harmonization of tax regimes, introduction of new taxes and/or tax regimes, taking into account the peculiarities of Russian business are the priority tasks of improvement of the tax system¹⁷.

We offer the Concept of VAT reform, which provides, in particular, the following innovations in the Russian Tax Code¹⁸:

- harmonization of the general system of taxation and special tax regimes, an important element of which is the abolition of paragraph 5 of Article 173, introducing a turnover tax in the relations of enterprises subject to the general tax treatment and special regimes;
- introduction of the regime of real exemption from VAT (Goods and Service Tax, GST) of micro-enterprises of the industrial sphere within the general system of taxation (Article 145 of the Russian Tax Code with cancellation of paragraph 5 of Article 173 of the Tax Code);
- significant restriction of the use of special regimes, reduction of the marginal income for work using the simplified tax treatment to the values accepted in the EU countries;
- full prohibition of application of special regimes in wholesale trade.

VAT Exemption Regime within the General Tax Treatment Framework

The proposed Concept of VAT reform envisages reducing the tax burden for micro-enterprises in

priority industries, creating a regime of real VAT exemption within the general tax treatment framework through amendment of Article 145 of the Russian Tax Code and abolishing paragraph 5 of Article 173 of the Russian Tax Code¹⁹: The company keeps a record of VAT (GST), but is exempt from its payment to the budget until reaching the limit value of income established by the legislator (currently, it is RUB 2 million per quarter). This innovation will make the general tax treatment a really preferential tax regime for micro-enterprises, which are in the beginning and middle of the chain of promotion of goods (works, services) from producers to the end user.

In contrast to the simplified tax treatment, the application of the amended general tax treatment will not require a complex procedure of transition from the general tax treatment to the simplified one and back, and the tax control shall be carried out in conjunction with assignments to social funds and payment of personal income tax.

Work Artels: Labor Tax System

The fundamentals of the Russian tax system were formed taking into account the best world practices in the field of tax policy, but without sufficient consideration of the specifics of economic, social and political conditions of Russia, and its historical development.

The organizational and legal forms of legal entities adopted in Russia do not fully take into account the traditions and mentality of the people, the real forms of involvement of citizens in labor and civil relations, which is one of the important reasons for not involvement of significant part of able-bodied citizens in tax relations with the State²⁰. As a result, millions of builders, seasonal workers in agriculture and forestry, in other industries, work without proper registration of contractual relations with the employer, and they are rightless. Personal income tax and contributions to social funds are not paid for them. The main and

¹⁶ Davletshin T.G. [Reforming the Russian Tax System: Problems and solutions]. *Finansy i kredit = Finance and Credit*, 2018, vol. 24, iss. 2, pp. 465–488. (In Russ.)
URL: <https://doi.org/10.24891/fc.24.2.465>

¹⁷ Davletshin T.G. [Reforming Chapter 21 of the Russian Tax Code: From VAT to GST]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 32, pp. 1930–1943. (In Russ.)
URL: <https://doi.org/10.24891/fc.23.32.1930>

¹⁸ Ibid.

¹⁹ Davletshin T.G. [Reforming the Russian Tax System: Problems and solutions]. *Finansy i kredit = Finance and Credit*, 2018, vol. 24, iss. 2, pp. 465–488. (In Russ.) URL: <https://doi.org/10.24891/fc.24.2.465>;
Davletshin T.G. [Reforming Chapter 21 of the Russian Tax Code: From VAT to GST]. *Finansy i kredit = Finance and Credit*, 2017, vol. 23, iss. 32, pp. 1930–1943. (In Russ.)
URL: <https://doi.org/10.24891/fc.23.32.1930>

²⁰ Ibid.

primary subject of entrepreneurial activity in construction, i.e. a construction work team, is now under the thumb of criminal syndicates, and it seems that the State has accepted the fact.

In pre-revolutionary Russia, work artels (workmen's cooperative associations) were one of the most common forms of citizen groups in order to achieve economic results. Artels remained part of the mentality of the Russian people, one of the manifestations of its identity²¹ [13, 14].

Currently, millions of citizens are *de facto* working in the artels. They get set up to perform casual works (for example, construction of an object, designing, R&D, etc.), and temporary (seasonal) works. Since the Russian Civil Code does not provide for an organizational and legal form corresponding to the real status of work artels, they are usually registered as OOO (Limited Liability Company) or IP (Sole Proprietors), and in some rare cases, as production cooperatives.

These enterprises have a high percentage of value added in the price of production, their tax burden reaches 45 percent of the proceeds considering the general tax treatment. The transition to the simplified tax treatment catastrophically worsens the financial results due to the price decrease by 18 percent (VAT rate) (Tables 4 and 5), illegal schemes of tax optimization are widely used through the sham companies.

This level of taxation is inconsistent with the principles of fairness and proportionality, so new tax regimes that represent acceptable levels of taxation are needed.

For this purpose, we propose to supplement the Russian Civil Code Article 50 *Commercial and Non-Profit Organizations* with a new organizational and legal form of legal entities, i.e. *Work Artels*, and the Russian Tax Code with a new article *Special Tax Regime: Taxation of Work Artels*. As well, we propose to develop and adopt a *Law on Work Artels* ensuring a simple procedure of performance-based registration and liquidation of work artels, with the most simple system of taxation and reporting.

²¹ Belonovskaya A.M. [Team-work in Economic Organization in the Papers of Russian Scholars in Late XIX – Early XX Century]. *Vestnik RGGU. Seriya: Ekonomika. Upravlenie. Pravo = RSUH/RGGU Bulletin. Series Economics. Management. Law*, 2010, no. 6, pp. 132–143. URL: <https://cyberleninka.ru/article/n/artelnaya-forma-hozyaystvennoy-organizatsii-v-issledovaniyah-rossijskih-uchenyh-kontsa-xix-nachala-xx-v-1> (In Russ.)

The basic principles of the organization and activities of work artels are as follows:

performance-based registration;

performance of works at the expense of the customer;

a non-profit organization. In contrast to production cooperatives, work artels are set up in order to receive remuneration for the work, realize directly their work, labor, intellect, etc., and they do not have rights to the products made;

wages and assignments to social funds make the main percentage in the structure of expenses. All the income gets distributed among the members of the group in accordance with the labor participation;

some of the income of the artel (for example, up to 20 percent) may be spent on current expenses (necessary services for conducting the activities, housekeeping, tools, work wear, etc.) at the discretion of the artel members, and is not subject to assignments to social funds;

work artels are not personal income tax agents, a member of the work artel reports on the personal income tax at the place of residence (in the future);

work artels are exempt from VAT really with the abolition of paragraph 5 of Article 173 of the Russian Tax Code.

However, unlike other special tax regimes, there should be no income marginal value limitation, because the construction objects can be large, and the artels, as well, respectively.

Performance-based registration will contribute to tax control, and the main attention in tax administration should be focused on the real receipt of insurance assignments to social funds, which can be written off on the direct debits basis as funds get credited to the current account.

General Tax Preferential Treatment and the Work Artels Tax Regime vs. General and Simplified Tax Treatments

We conduct a comparative analysis of the level of taxation of the enterprise with a high value added under the general and simplified tax regimes, and under the proposed regimes, i.e. the general tax treatment with real exemption from VAT within Article

145 of the Russian Tax Code and the *Taxation of Work Artels*.

Table 5 shows the price of products, the structure of production costs and profits of enterprises with high value added (created mainly by labor workers) under different tax regimes: (1) – General tax treatment, (2) – Simplified tax treatment, when selling to end users, (3) – Simplified tax treatment, when selling to users, subject to the general tax treatment, (4) – General tax treatment with a benefit in accordance with Article 145 of the Russian Tax Code, (5) – Taxation of work artels.

The acceptable value of profit before tax is taken as ten percent, taxes and assignments to social funds and the wage-ceiling are calculated under the following conditions:

- material costs with VAT included: 10 percent;
- sundry expenses: 10 percent;
- tax rates applicable to artels in 2018;
- personal income tax rate: 13 percent;
- assignments to social funds considered similar to the ones of enterprises subject to the simplified tax treatment;
- no profit;
- the main part of the proceeds, namely 80 percent, is used to pay for labor and assignments to social funds;
- the rest part of the proceeds, namely 20 percent, is used to cover the current expenses (payments of necessary services, housekeeping, tools, work wear, etc.), and it is not taxed.

Table 5 gives the calculated values of the amount of taxes payable, accrued payroll and profit of the enterprise with high value added in different tax regimes.

Calculations for the general tax treatment are presented in two variants: standard variant and the one proposed in the article, i.e. preferential tax regime in accordance with Article 145 of the Russian Tax Code with the abolition of paragraph 5 of Article 173 of the Code.

Calculations for the simplified tax treatment are made upon selling to end users when the price is equal to the selling price of enterprises subject to the general tax treatment, i.e. 118 conventional money units, and also to customers subject to the general tax treatment,

when the selling price is less by the VAT amount, that is equal to 100 conventional money units.

Calculations for the *Taxation of Work Artels* regime are given under the rates of assignments to social funds, standard for the simplified tax treatment. The enterprises subject to the simplified tax treatment and work artels have costs increased by the amount of incoming VAT, and reduced due to reduction of assignments to social funds (this benefit has been abolished since January 1, 2019).

Thanks to the simplified tax treatment, the profit multiple times higher if the products are sold to the end user, and multiple times lower, and can even be a loss if the customer is the enterprise subject to the general tax treatment.

For the work artels regime, the buyer's tax regime is insignificant, because they are really exempt from VAT.

An analysis of *Table 5* shows that preferential general tax treatments with a real exemption from VAT and the *Taxation of Work Artels* regime will provide the opportunity to allocate 50 to 60 percent of the proceeds for payroll funds (accrued) at the acceptable tax burden level of 22 to 29 percent.

It is necessary to bear in mind that real exemption from VAT in the middle or beginning of the chain of production and circulation of goods (works, services) means budget support *de facto*, that is, the State resigns VAT already paid by the end user or the State, in favor of the exempt from payment: in this particular case, the amount is RUB 16.2.

Considering this condition even, the budget benefits: RUB 26.2 – 16.2 = 10, for work artels, and RUB 28.7 – 16.2 = 12.5, for preferential general tax treatment (26.2 and 28.7 are the estimated tax amounts from *Table 5*). But thanks to the ever-growing use of tax evasion schemes through sham companies, the budget funds and taxpayers' funds fall into the pockets of offenders, and *bona fide* taxpayers are forced to undergo double taxation.

Conclusions

The existing tax system contradicts the principles of equality, neutrality, fairness and proportionality of taxation. It also does not fully take into account the full range of real-world relationships in the economy.

VAT reform and harmonization of tax regimes (the abolition of paragraph 5 of Article 173 of the Russian Tax Code is a priority objective) give the possibility to form a preferential regime of taxation for micro-business in the production sphere within the general tax treatment framework.

To take into account the peculiarities of work in artels, it is necessary to introduce certain amendments into the Russian Civil Code with respect to civil forms of work

artel organizations, and the Russian Tax Code, with respect to the *Taxation of Work Artels* special tax regime and adoption of the law on work artels.

Along with the reform of income and personal income taxes, these amendments will ensure the tax legislation acceptable for the vast majority of entrepreneurs. This will bring millions of businessmen in from the cold, keeping tax revenues growing under constant tax rates.

Table 1

Inflow of taxes, levies and assignments from the *Construction* economic activity to social funds, and their percentage in the budget system of the Russian Federation, 2017

Tax	Paid, billion RUB	Percentage
Value Added Tax	353,2	35,7
Insurance Contributions to State Non-Budgetary Funds	295,3	29,8
Personal Income Tax	162,9	16,4
Profits Tax	121,7	12,3
Special Tax Treatments	27,6	2,8
Property Tax	15,9	1,6
Transport Tax	3,8	0,4
Local Taxes (Land Tax and Other)	7,4	0,7
Other Taxes and Levies	2,5	0,3
Total Taxes and Deductions	990,3	100

Source: Authoring, based on the RF Federal Tax Service data (Statistical Tax Reporting, Form 1-HOM)

Table 2

The scope of works performed by organizations of all forms of property by *Construction* economic activity, at then-effective values, billion RUB

Form of Ownership	2000	2005	2010	2013	2014	2015	2016	2017
State-owned	52,9	95,6	154,2	176,9	150,3	157,6	153,9	n/a
Municipal	4,5	13,4	16,9	22,8	17,4	17,2	18,5	n/a
Privately-owned	322	1 428,2	3 973,8	5 304,5	5 500,4	6 403,2	6 519	n/a
Mixed (Russian)	111,9	131,5	102,8	96,4	109,3	92,6	65,2	n/a
Other	12,5	85,7	206,4	418,9	347,8	339,8	447,6	n/a
Work Performed, Total Amount	503,8	1 754,4	4 454,1	6 019,5	6 125,2	7 010,4	7 204,2	7 545,9

Note. To ensure statistical comparability, the figures for 2014 were calculated without taking into account the data on the Republic of Crimea and Sevastopol.

Source: The Russian Federal State Statistics Service. Russia in Figures, 2018.

URL: http://www.gks.ru/bgd/regl/b18_11/Main.htm

Table 3

The composition and structure of tax revenues from the *Construction* economic activity to the budget system of the Russian Federation in 2011–2017, billion RUB

Taxes and Levies	2011	2012	2013	2014	2015	2016	2017
Profits Tax	92,6	111,5	97,2	106,8	110,3	117,8	121,7
Property Tax	17	19,1	21,8	20,4	16,1	16,1	15,9
Transport Tax	3,5	3,8	4,2	4,5	5	4,3	3,8
Local Taxes	4	4,9	5,6	6,6	7,5	7,7	7,4
Other Taxes	22,2	27	25,7	9	3,2	2,5	2,5
Special Tax Treatments	14,1	16,8	18,3	19,6	20,3	22,7	27,6
Aggregate Taxes	153,4	183,1	172,8	166,9	162,4	171,1	178,9
Insurance Contributions	213,6 [*]	235,8 [*]	252 [*]	255,1 [*]	253,5 [*]	280 [*]	295,3
Total Taxes and Levies	367	418,9	424,8	422	415,9	451,1	474,2
Personal Income Tax (Tax Agent)	117,5	129,7	138,6	140,3	139,4	154	162,9
Value Added Tax (Indirect Taxes)	245	293	275,5	300	299,4	350,6	353,2
Total Revenue from Personal Income Tax and VAT	729,5	841,6	838,9	862,3	854,7	955,7	990,3

^{*} The data on the insurance contributions were obtained by dividing the Personal Income Tax by 0.55.

Source: Authoring, based on the RF Federal Tax Service statistical tax reporting data (Form 1-HOM), and the RF Federal State Statistics Service data (Russia in Figures, 2016)

Table 4

Aggregate tax on construction enterprise depending on the level of material costs of production (works, services) and tax regimes (general or simplified tax treatments) under equal conditions. Calculations for the simplified tax treatment when selling products: to end users / to customers using the general tax treatment

Material Costs	70 / 10		50 / 30		30 / 50		10 / 70	
	GTT[*]	STT^{**}	GTT[*]	STT^{**}	GTT[*]	STT^{**}	GTT[*]	STT^{**}
Proceeds (Reference RUB)	118	118/100	118	118/100	118	118/100	118	118/100
VAT 18%	5,4	–	9	–	12,6	–	16,2	–
Profits Tax 20% (Return–Cost 15%)	2	2,3/0	2	3/0,3	2	3,8/1,1	2	4,6/1,9
Personal Income Tax 13%	1	1	3	3	5	5	7	7
Funds 30/20%	2,3	1,5	6,9	4,6	11,5	7,7	16,2	10,8
Other Taxes	2,8	1	2,8	1	2,8	1	2,8	1
Tax Burden (Cash/Proceeds, VAT excluded)	13,5	5,8/3,5	23,7	11,6/8,9	33,9	17,5/14,8	44,2	23,4/20,7
Tax Burden (Cash/Proceeds, VAT included)	11,4	–	20,1	–	28,7	–	37,5	–
Profit Before Tax	10	15,2/–2,8	10	20,3/2,3	10	25,4/7,4	10	30,6/12,6
Accrued Payroll	6,7	6,7	20,1	20,1	33,5	33,5	46,8	46,8

^{*} GTT – General Tax Treatment

^{**} STT – Simplified Tax Treatment

Note. Taxes are calculated using the current tax rates, 2018.

Source: Authoring

Table 5

Revenues, taxes, tax burden, wages and profits of the enterprise depending on tax regime (general tax treatment, simplified tax treatment, general tax treatment with VAT exemption, and the tax regime for work artels)

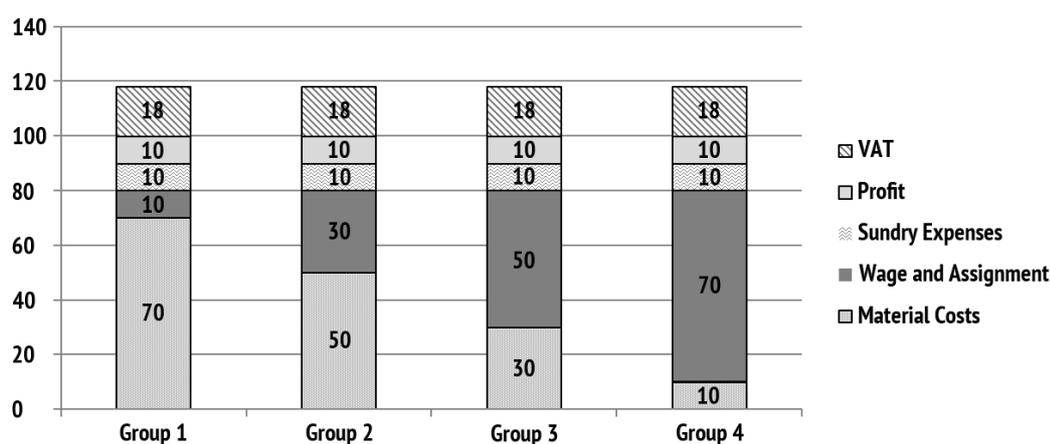
Tax Treatment	GTT	STT (End User)	STT (Consumer subject to GTT)	GTT, Article 145	Work Artel
Proceeds	118	118	100	118	118
VAT 18%	16,2	–	–	–	–
Profits Tax 20% (Return–Cost 15%)	2	1,5	1,5	2	–
Personal Income Tax 13%	7	9,2	7,3	8,8	10,3
Funds 30/20%	16,2	14,2	11,2	20,3	15,9
Other Taxes	2,8	1	1	2,8	–
Aggregate Taxes	44,2	25,9	19,5	33,9	26,2
Tax Burden (Cash/Proceeds, VAT included)	37,5	22	19,5	28,7	22
Accrued Payroll	46,8	61,8	48,7	57,7	69
Profit Before Tax	10	10	10	10	–

Note. Taxes are calculated using the current tax rates, 2018.

Source: Authoring

Figure 1

Price of products, cost structure, and profitability of enterprises using the general tax treatment at different values of value added



Source: Authoring

Figure 2

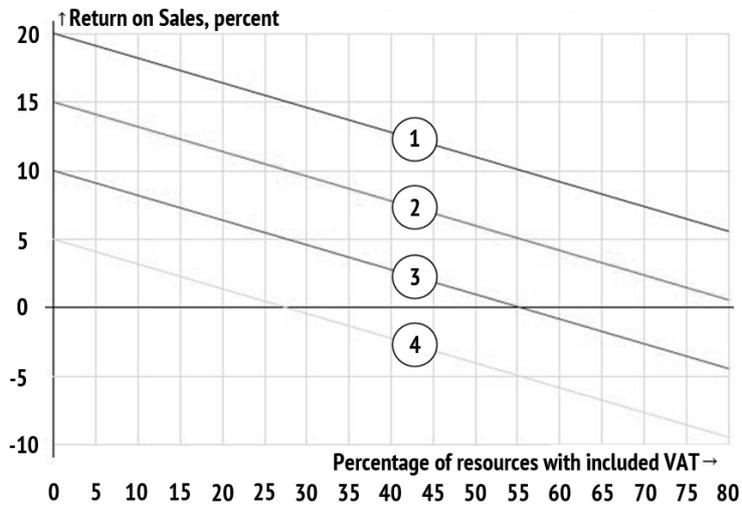
Profitability of enterprise using the simplified tax treatment as compared to similar enterprise using the general tax treatment depending on the share of material costs with included VAT in the selling prices of goods (works, services) (Customer – End user)



Source: [3]

Figure 3

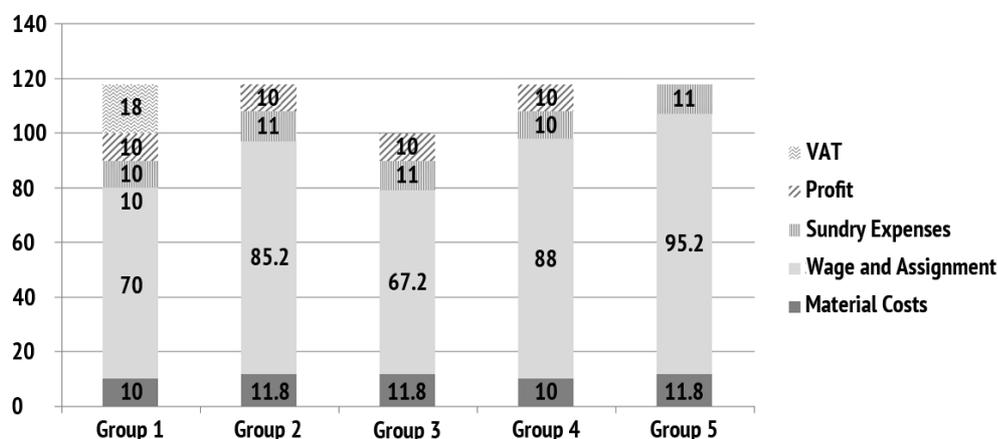
Profitability of enterprise using the simplified tax treatment as compared to similar enterprise using the general tax treatment depending on the share of material costs with included VAT in the selling prices of goods (works, services) (Customer – Enterprise using the general tax treatment)



Source: [3]

Figure 4

Price, cost structure and profitability of enterprises under different tax regimes (general tax treatment, simplified tax treatment, general tax treatment with VAT exemption, and the tax regime for work artels)



Source: Authoring

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Translated Article[†]

INVESTING ACTIVITY OF INSURANCE COMPANIES: OPPORTUNITIES, PROSPECTS AND DEVELOPMENT COURSE



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Abstract

Subject The research focuses on the investing activity of insurance companies, evaluates development opportunities and interaction with other actors of financial markets.

Objectives The research examines opportunities for investing activities of insurers, substantiates prospects and aspects for further improvement.

Methods We applied analytical and statistical methods.

Results We reviewed the opportunities of the Russian insurers to develop their investing activities, focusing on trends in insurance premiums, growth in insurance reserves and equity, accumulation of capital and premiums in the insurance market, interpenetration of the insurance and banking sectors. The article points out key aspects to invest in and provides the rationale.

Conclusions and Relevance The Russian insurers have good opportunities for investing activities as life insurance reserves and capital increase. Bank deposits will remain the main financial vehicles. The banking sector becomes more reliable and lucrative for insurers, allowing them to make a marketable and reliable portfolio, albeit less profitable. Trust management may take the lead among other services. Optimizing the investment portfolio through trust management, entities will gain a profitable investment option, though a more risk one.

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Introduction

Being a part of the financial market, the insurance market is influenced by developments in other segments of financial markets. However, it has some distinctions since insurance companies play a special role. Insurance companies may cooperate with actors of financial markets in a variety of formats. As a matter of fact, they compete with other financial institutions, targeting at available funds of the population. Insurance companies consume services of other businesses operating in financial markets. Furthermore, they provide services to other actors of the financial market, say, hedging investors or issuers against risks and acting as guarantors, etc. Attracting considerable funds of the insured and considering the probabilistic nature of payouts, insurers may possess some available financial resources to invest and derive additional income.

The financial potential of insurers comprises their equity and raised funds, including borrowings. Actuarial reserves, which are made to perform contractual obligations under insurance contracts, account for a substantial part of the raised funds, being the main source of investment. Equity is another source. In regulatory documents, investing activity is viewed through dealing with actuarial reserves and equity (capital)¹.

The Russian insurance companies are allowed to make a variety of investment decisions, concerning, for example, government securities, stocks, bonds, certificates of eligibility to subsidized housing, units of investment funds, deposits, immovable property, precious metals, etc. However, such investments are legislatively required to be diversified, marketable, repayable and profitable. Such principles are contradictory by nature since the most reliable assets usually generate low income, while more profitable ones entail a high risk of losses. The principles are balanced with diversified investment portfolios.

¹For the source article, please refer to: Козлова О.Н., Калачева Е.А., Калачева И.В. Инвестиционная деятельность страховых организаций: возможности, перспективы и направления развития // *Финансы и кредит*. 2018. Т. 24. № 9. С. 2056–2074. URL: <https://doi.org/10.24891/fc.24.9.2056>

¹Instructions of the Central Bank of Russia of February 22, 2017 № 4297-У, *On the Procedure for Investment of Actuarial Reserves and List of Assets Permitted for Investment*; of February 22, 2017 № 4298-У, *On the Procedure for Investment of Insurer's Equity and List of Assets Permitted for Investment (in combination with Asset Structure Requirement)*.

In the course of their investment operations, insurers have to hew to the megaregulator's policy which pursues the liquidity and reliability of investment portfolios. Such policy basically supports the banking sector, protects insurers' capital through the diversification of their assets, puts up the capital in low-risk assets, stimulates the development of the governmental financial sector.

Hence it is unlikely that insurers focus on cost effectiveness in their investing activities. In some systems of investment laws, insurers' profit is often lower than the inflation rate. In such cases, an investment policy may pursue only incidental profits, namely, gaining a reciprocal business opportunity from an investee. For example, collateral protection insurance when reserves are placed as bank deposits, or performance of relevant standards that must be observed to keep the license, access to customers of banks for credit insurance, offering their insurance plans, etc. However, such restrictions are unavoidable because insurance companies play a special role, being guarantors of stability for other market actors. Profit-making insurers and governmental regulators may reach the optimal trade-off by leveraging investment portfolios in accordance with the given instructions.

Evaluation of Investment Opportunities and Prospects for Insurance Companies in Russia

The scientific literature provides a deep insight into investment aspects, such as the evaluation of the investment potential of insurers and modeling of the investment portfolio. Some studies² [1] present a set of metrics reflecting the investment potential of insurers and determining factors. Other ones³ [2] investigate the formation of the most preferable investment portfolio of insurers. Investing is viewed

²Turgaeva A.A. [Investment potential of insurance companies and their competitiveness evaluation]. *Finansy i Kredit = Finance and Credit*, 2017, vol. 23, no. 2, pp. 89–109. (In Russ.); Zhuravka E.S. [The specifics of creating the investment potential of insurance companies]. *Bankovskaya sistema: Ustoichivost' i perspektivy razvitiya: materialy nauchnoi konferentsii* [Proc. Sci. Conf. The Banking System: Sustainability and Development Prospects]. Pinsk, Polesky State University Publ., 2016, pp. 56–59.

³Akimova T.V. [The need and opportunities for leveraging the structure of an investment portfolio of the Russian insurance companies today]. *Strakhovanie v sisteme finansovykh uslug v Rossii: Mesto, problemy, transformatsiya: materialy nauchno-prakticheskoi konferentsii* [Proc. Sci. Conf. Insurance as part of financial services in Russia: The Role, Issues, Transformation]. Kostroma, Kostroma State University Publ., 2017, pp. 109–112.

microeconomically, considering the insurer's prospects, first of all, in terms of insurance, marketing and organizational process. We approach the subject macroeconomically in terms of the insurance market development and its trends, sectoral structure, accumulation of capital and development of other financial markets. Substantiating investment prospects of insurance companies, we refer to the same stances.

The factors below have a positive effect on investing activities of insurance companies, streamlining their evolutionary process. These are trends in insurance premiums, expansion of long-term insurance services, dynamism of insurance reserves, equity trends, accumulation of capital in insurance, interaction of the banking and insurance sectors.

Dynamics of Insurance Premiums and Expansion of Long-Term Insurance

Insurance premiums serve as the main source of insurance companies' income, laying the basis for actuarial reserves. Companies offering compulsory insurance services mainly have the social mission. So, investing is not a priority for them at all. Investing seems interesting and lucrative for companies dealing with voluntary insurance services. Insurance premiums from voluntary insurance contracts (*Table 1*) are higher than those under compulsory ones, setting a positive tendency. We should mention the year 2015 as an exceptional case when insurance premiums shrank dramatically and absolutely under traditional insurance contracts and due to insurers' focus on the banking sector then facing a reduction in the retail and other lending during the crisis, which had been the key source of credit insurance premiums. In 2015, automobile liability insurance was the main driver of the insurance market, which was quite logic because lawmakers raised insurance tariffs. However, the pricing maneuver came to its end, thus letting the dynamics go down to 5.2 percent for the following two years in 2016 and demonstrating an absolute reduction of 5 percent in 2017.

Insurance companies offering long-term life insurance services demonstrate the highest interest in investing. Analyzing *Table 1*, we point out that life insurance as part of loan contracts shows good dynamism. What drives the life insurance market is investment insurance generating fees of credit institutions distributing it⁴ [3].

⁴ Kozlova O.N., Kushnir O.G. [Life insurance: Prospects of implementing UNIT-LINKED programs in Russia]. *Strategiya razvitiya*

People seek to conclude such contracts because they can have greater yields on investment insurance policies than on bank deposits. A growth in retail lending also allows to expand investment insurance services since it is a good alternative to bank deposits, being both profitable and reliable.

Companies offering life insurance services compete with banks, vying for the available funds of the population. However, what gives them an advantage is that banks mostly work with short-term and mid-term capital, while life insurance accumulates long-term capital since its liquidity is not a top requirement [4].

Positive dynamism of life insurance premiums contributes to investment opportunities of insurers since the insurance portfolio is made for a long-term period, being less dependent on risks, and respective payouts can be estimated with mortality statistics and actuarial mathematics. First of all, investment opportunities relate to long-term life insurance, rather than short-term hedging against risks, which is unstable.

Dynamics of Actuarial Reserves

As for raised funds, actuarial reserves constitute the central pipeline of investment. *Table 2* shows trends and composition of actuarial reserves by type of insurance. In 2016, actuarial reserves amounted to RUB 1,136,727.8 in absolute values.

Analyzing the way actuarial reserves are broken down among companies offering life insurance and the other, we see that the latter possess the most substantial amount of resources, which can be utilized to fees investing activities. The ratio of long-term resources (life insurance reserves) to short-term ones significantly changes year-on-year, with the first ones prevailing. Throughout the analyzable period, the ratio was 1 to 6 in 2013, 1 to 5 in 2014, 1 to 3 in 2015 and 1 to 2 in 2016. Life insurance expands its market niche, thereby enabling insurers to capture resources which are beyond strict liquidity requirements, inducing more long-term investment, better financial standing of insurers and positive economic effects of such investment.

strakhovoi deyatel'nosti v RF: Pervye itogi, problemy, perspektivy: materialy nauchnoi konferentsii [The strategy for Insurance Development in Russia: The First Outcome, Issues, Prospects]. Yaroslavl, Yaroslavl State University Publ., 2015, pp. 445–449.

Dynamism of Equity

Similarly to actuarial reserves, equity nurtures investing too. In 2016, the Russia insurers' equity amounted to RUB 461,987.3 million, with the authorized capital making RUB 216,362.4 million. The authorized capital is almost the only category having a variable tendency (Table 3). The reason is that the Central Bank of Russia recalled licenses of some insurance companies, transferring their assets to the renown insurers.

Equity may serve for further development of insurers, protecting their stability and ability to perform their obligations. Whereas such resources are usually not encumbered with any liabilities, some of them can be used for comparatively long-term and less liquid types of investment. All insurers have been seeing their equity grow, accounting for 25–30%. The authorized capital makes 45–50 percent of all insurers' equity. However, actuarial reserves grow faster than equity, with the life insurance reserves demonstrating the fastest pace. Investment mainly proceeds from the employed resources, with actuarial reserves of long-term life insurance increasing.

Capital Accumulation in Insurance Sector

The accumulation of capital takes place due to a decrease in the number of insurers and increase in the volume of insurance transactions. In 2016, there were 256 insurance companies in the insurance market (420 ones in 2013).

If, in 2013, an insurance company collected RUB 2.3 billion in insurance premiums, the amount reached RUB 4.65 billion in 2016. The withdrawal of insurers from the market caused the accumulation of capital and premiums in the insurance sector and certain market segments. For example, for nine months of FY 2017, five major insurance companies came to holding of 41.7 percent of assets, 47.6 percent of capital, 41.7 percent of premiums, 53.8 percent of insurance payouts⁵.

An increasing concentration of financial businesses may generally have a positive impact on its performance and efficiency of a certain entity's investment. Comprising a certain number of entities, the high-concentration financial system, including the insurance one, stabilizes the system since it enable the said institutions to be

more profitable, diversified and simplifying the oversight for controlling authorities. Major insurance companies, which pertain to financial groups of companies, enjoy substantial advantages. Drawing upon the scale effect, they reduce their conditionally fixed costs. Large financial groups (for example, Gazprom, VTB) set up an insurance company that *a priori* outperforms other ones acting on their own, thus providing for their expansion and cutting marketing costs. The concentration of financial businesses and their financial advancement differs across countries, thus proving the above statement [5].

Interaction of Banking and Insurance

The interaction of the banking and insurance sectors has been intensified for the recent years, including insurance companies pertaining to banking structures). Banks and insurance companies may cooperate on a variety of issues, which are vastly described in the scientific literature. As mentioned in the researches indicated herein⁶ [6] the interaction of banks and insurance companies is characterized with the amount of insurance policies sold by banks, and insurance premiums. According to estimates of the Central Bank of Russia, banks seek to directly cooperate with insurers not only to secure loan repayment, but also to gain ever increasing fees. In 2016, insurance premiums under insurance contracts concluded through credit institutions accounted for 24.7 percent of total insurance premiums (13.1 percent in 2013). Insurance premiums under life insurance contracts concluded through credit institutions accounted for 84.2 percent of intermediaries' premiums in 2016. Credit institutions earn a stable percentage of intermediaries' fees and even exceed 86 percent of such fees for life insurance services.

Insurers have good investment opportunities. They are quite sustainable institutions whose assets do not tend to change abruptly. Therefore, they can quite freely engage in investing activities without being exposed to a dramatic change in the market environment, which would make them revise the structure of assets.

Insurers' resources help them rapidly increment their assets mainly by making actuarial reserves. Insurance companies are quite an important part of the Russian economy, demonstrating a strong resilience to the unstable economic conditions. The Russian

⁵ *Obzor klyuchevykh pokazatelei strakhovshchikov za III kvartal 2017 goda. Informatsionno-analiticheskie materialy* [Overview of Key Indicators of Insurers for Q3 2017: Information and Analytical Data]. Moscow, Central Bank of Russia Publ., 2016, 29 p.

⁶ Tret'yakova T.A., Mazaeva M.V. [A symbiosis of banks and insurers as a need for modern economic conditions]. *Finansy i Kredit = Finance and Credit*, 2015, no. 8, pp. 41–47. (In Russ.)

insurance market sees a growth in the investment potential year-on-year that is held by a few insurance companies. As mentioned above, it stabilizes the market, rather than threatens to it. When banks and insurance companies unite in pursuit of common interests, the dual and bilateral effect is generated, including a choice of investees.

Investment Portfolio of Insurance Companies

Analyzing the Russian insurance companies' opportunities, we consider the current investment portfolio and determine what would be quite reasonable to invest in.

The efficiency of investing activities are measured by the vitality of the investment market. This can be assessed with the following metrics:

- return on investment of the insurance sector;
- the diversification of insurers' investment.

The Return on Investment (ROI) varies among insurers. Few insurance companies disclose their ROI. For example, as for some insurance leaders in 2015, their ROI was as follows: AO SOGAZ, Ingosstrakh Insurance Company – 10 percent, VTB Insurance – 11.13 percent. Insurers were generally satisfied with their ROI in 2015 and 2016. However, although a declining trend in interest rates of the Central Bank of Russia and market rates have a favorable effect on the economy, this will undermine the return of insurers and institutional investors on investing activities. In 2016, insurers experienced risks inherited from the banking sector. After the Central Bank of Russia revoked banking licences of some banks, deposits of some insurance companies got trapped by major banks. Such losses turned to be rather painful due to a decrease in the business profitability and austerity measures.

According to *Table 4*, bank deposits, receivables and bonds account for the greater part of assets. Although accounts receivable from insurance transactions are treated as assets acceptable to cover actuarial reserves, being subject to terms of diversification, collectibility, profitability and liquidity, it is unreasonable to consider it as an investment instrument in the given context because it is just an additional product rather than the main profit generating vehicle.

Insurers opt for bank deposits most of all among all possible investment decisions. In 2016, their amounted to RUB 487,859.5 in absolute terms. At the end of 2016,

bank deposits accounted for 32.2 percent, remaining stable throughout the recent period of time. The phenomenon is no surprise because many insurance companies are set up as part of the existing group of companies, including banking ones, which let them place a deposit with a bank pertaining to the same group. For example, AO SOGAZ within Gazprom, VTB Insurance within VTB Group, Sberbank Life Insurance, a subsidiary of Russia's major bank, within Sberbank of Russia.

Bonds follow bank deposits in terms of popularity. Investing in corporate bonds is a more preferable option. As compared with promissory notes, for example, they are associated with lower operational risks, generating higher profit and taking a shorter period of time for repayment. What makes them advantageous is high liquidity and low par value. Knowing their return and repayment beforehand, insurers can do financial planning, timely arrange for certain insurance payouts, thus increasing the return on assets as much as possible. However, bank deposits remain very competitive for the same reasons as an alternative option of bonds and investment.

Governmental and municipal securities take the same position as monetary funds, stocks and real estate, i.e. instruments without definite return, reflecting the low demand of insurers for them. The low rate of return is the main reason for this. Tax benefits cannot even ignite the demand among holders of such securities. Municipal securities have some disadvantageous features. They are less reliable since federal debt securities can be secured with money issue, while this option is not applicable to municipal assets. They are exposed to high risk because, in case of any legislative amendments, lawmakers, first of all, respect interests of those ones holding securities of federal issuers, while holders of municipal securities are often simply neglected.

Insurers also invest in technology, such as databases and insurance history records, telematics and automated systems for processing data on customers, losses, etc., which is posted as *Other assets*. However, due to the specifics of investment, high uncertainty and risks, such investment is scarce, accounting for about 4 percent of total portfolio.

Based on data of the RF Federal State Statistics Service, *Table 5* presents flows of income from various investment and estimates of its efficiency.

The financial result of investment is measured by collating income and expenses. Investment expenditures include the maintenance of the insurer's department in charge of investment management, fees of the specialized depository, etc. ROI has shrunk by 25 percent for five years, but the result of investment transactions more than doubled. This may be evidence that capital is managed more effectively and more insurers opt for long-term investment (instead of short-term ones) as the insurance sector evolves. Hence, insurers keep their funds in long-term projects in order to derive profit in the future, though they could withdraw the funds and turn them into the return on income today. According to *Table 5*, the financial result of investment stem from resources raised (actuarial reserves). We can assess the effectiveness of actuarial reserves as a source of investment by comparing the result and amount of actuarial reserves. The real return on investment will be different because all actuarial reserves are attributed to income-generating investment. For example, accounts receivable are formed in the course of insurance activities as an additional product, rather than a dedicated investment decision.

We can conclude that, despite the economic instability of the Russian economy, insurers have positive and more than satisfactory profit trends. Such returns mainly result from bonds, bank deposits and benefits insurance companies gain dealing with the banking sector. Investing activities got optimized, which is corroborated with the better result of investment transactions. However, a decrease in the return on investment signifies that ROI remains positive, resulting from a reduction in the insurance market actors. This can be explained with the natural cause-and-effect relationship, without warning that insurers stepped back as investors.

Investing Activities of Insurance Companies: Focal Points

Having analyzed the investment portfolio, we determined key avenues of investing activities that insurance companies will follow in the nearest future.

1. The development of financial markets.

Investment opportunities depend not only on what insurers can, but also how financial markets evolve.

Evaluating the percentage of assets in the Russian insurers' investment portfolio, we infer that the

development course will have the most palpable effect on the banking sector and terms of deposits, securities market (stocks and bonds), market of governmental securities in the coming years.

Banking indicators for 2017 show that the banking system is recovering after the 2014–2015 developments. Capital stock was considered to suffice for further expansion of lending and banking. The key interest rate and cost of funding were declining slowly, thus having a positive impact on financial indicators of the banking sector. Lending volumes grow faster than GDP, while interest rates on loans repeat a drop in the inflation rate and key interest rate of the Central Bank of Russia. The overwhelming majority of banks increment their profits, with the number of unprofitable credit institutions decreasing. In 2017, the banking sector's assets grew by 9 percent (except for an impact of the foreign exchange rate), up to RUB 85.2 trillion (a 3.4-percent increase in 2016).

Nowadays we can observe the effect of the policy the Central Bank of Russia has been implementing for several recent years, purging weak and *mala fide* actors from the banking market. In 2017, the Central Bank recalled twice as less banking licenses as in 2016. We can say that it has completed a greater part of its *banking market cleaning plan*⁷. The job will be entirely done within the coming two or three years.

The future development of the banking sector will mostly depend on rates of economic growth, inflation, oil prices and other aspects. Considering the forecast of the Central Bank of Russia⁸, we dare say that the aggregate loan portfolio will be growing slowly within 2018–2020, while the inflation rate and cost of funding gradually decrease. Given the structural excess liquidity, in 2017, credit institutions borrowed less from the Central Bank of Russia. Such liabilities of banks decreased from 3.4 to 2.4 percent, meaning that banks mainly employed market sources of funding, including raising funds of the insurance sector as well. This is due to the fact that insurers *have to* deal with mortgage lending, thus placing their funds as bank deposits on rather meager terms (while alternative placements generate much greater returns). In such circumstances, the banking sector strongly influences insurers and

⁷ Report of the Central Bank of Russia for FY 2017.
URL: https://www.cbr.ru/publ/God/ar_2017.pdf (In Russ.)

⁸ The Main Lines of the Uniform National Monetary Policy for FY 2018 and 2019–2020 Period.
URL: [https://www.cbr.ru/publ/ondkp/on_2018\(2019-2020\).pdf](https://www.cbr.ru/publ/ondkp/on_2018(2019-2020).pdf) (In Russ.)

unavoidably depreciates the cost of funding, which is beneficial for banks as opposed to insurance companies. The trend will become more entrenched as mortgage lending expands. In 2017, mortgage loan balance increased by 15.7 percent as the government subsidized the interest rate on mortgage loans. However, as we have already noted, this disadvantage for insurance companies is offset with opportunities they can seize offering other insurance services supplementing banking products.

Although the Central Bank of Russia implements the strict policy of purges, the banking sector is expected to regain stability and assume to grow, contributing to the return on insurers' investment in deposits [7]. Therefore, the banking system is anticipated to recover within the coming 3–5 years. Mortgage lending is expected to grow or at least keep the same growth pace, thus opening good opportunities for insurers that dedicate their resources to mortgage, lending and other insurance services prevailing in the banking sector. Some researchers investigate what impact the insurance market have on the stock market⁹. In this research, we focus on prospects of investment in securities in terms of the securities market development.

Although becoming more popular among insurers, the market of bonds and stocks demonstrates rather a sluggish growth. At the end of 2016, the capitalization of the Russian securities market hardly accounts for 45 percent of the national GDP (35 and 30 percent in 2015 and 2014 respectively). The indicator may reach 250 percent of GDP in the most economically advanced countries like the USA. However, an annual capitalization increase of 5 to 10 percent debunks any concerns about the stagnation or crisis of this segment. The further development of the securities market and bond segment in particular, which insurers consider the second priority, is very likely to continue and receive the aid of the banking sector. Banks enjoy some privileges in the bond segment. Their significant balances, capital and bond deals helps them take leading roles in arranging IPOs of debt securities and ensuring the liquidity of bonds.

Raising traditional concerns about the legislative regulation, in 2015, the governmental securities market

fell like it did in 2009 as a result of the global financial crisis. That is the reason for so low capitalization and high trading volume in the market. Having dipped in 2014, it regained its previous maximum. Currently, the Russian governmental securities market continues evolving, taking into account and adopting successful practices of foreign countries. Comparing how the governmental securities market is governed and regulated in Russia and in the USA, United Kingdom, Switzerland, we notice their resemblance in terms of laws, issuance rules, types of circulating instruments [8]. They are similar due to the fact that Russia uses and actively implements foreign expertise and practices. Although the Russian securities market grows, the growth pace is much slower than was planned. Fluctuations also prevent insurers from strengthening their positing in it as institutional investors.

Deposits with the State-owned banks (the more the State is involved, the better) turn out to be the only option for insurers, considering the recovery of the banking sector, effects of credit risks for insurers that hold deposits with small banks, growing bank-driven distribution of insurance services, increasing profits of banks as intermediaries and insufficient development of the securities market. Choosing this option, insurers may not possibly derive high profit, but have lower risks and greater reliability, which corresponds with the substance of investing activities insurance companies are supposed to engage in, from perspectives of the megaregulator.

2. Optimization of Investment Management.

As mentioned in some studies referred to herein¹⁰[9], insurers are mostly exposed to risks of insurance, rather than insuring. However, investment risks may affect their financial stability. Securing the reliability and liquidity, the Central Bank of Russia restricts a choice of investment options. Therefore, the optimization of management can improve the quality of the investment portfolio. Insurers are entitled to transfer up to 50 percent of their actuarial reserves for trust management. Trust management of actuarial reserves is the competence of investment and managing companies. The latter distribute funds they accept to mutual investment funds, which may be multiple within the same managing company and usually have a

⁹ Fedorova Yu., Yablochkina E. [Key amendments to Rules for placement of actuarial reserves, their impact on the stock market and investment policy of insurers]. *Vestnik KhGAEP*, 2009, no. 3, pp. 24–28. (In Russ.)

¹⁰ Larionov A.V. [The role of the Bank of Russia in risk management of insurance companies]. *Finansy i Kredit = Finance and Credit*, 2018, vol. 24, no. 3, pp. 679–690. (In Russ.)
URL: <https://doi.org/10.24891/fc.24.3.679>

sectoral determination. There are more mutual investment funds than insurance companies, thus providing plenty of options to allocate assets. There were 1,275¹¹ mutual investment funds in Russia in the middle of 2018. Thus, trust management becomes a relevant investment decision for insurers due to its popularity, investment potential of insurance companies, and legal infrastructure that allows to transfer the significant amount of actuarial reserves for trust management. As part of trust management, the managing company is bound with some responsibilities and restrictions ensuring the protection of assets from the unintended use. They must be accountable to the megaregulator additionally to the responsibility to disclose their performance information. The managing company carries out its investing activities in accordance with the investment declaration, which indeed sets forth all legislative restrictions and requirements, including the composition and mix of the investment portfolio.

The trust management segment is mostly dominated by managing companies pertaining to banking groups. This provides access to the existing assets to a recently incorporated managing company. For instance, Sberbank Assets Management, Reiffeisen Capital, Alfa Capital, UralSib. Many managing companies is responsible not only for assets of third parties, but also for assets of the banking group they pertain to. Over 70 percent of mutual investment funds were incorporated with the intention to serve the power engineering sector of the Russian economy. Therefore, investing in certain mutual investment funds, the insurance company may cut its financial market research costs. This is in contrast with the situations when investors make a portfolio of securities issued by different and unrelated issuers. In such circumstances, there should be an analysis of several sectors.

There are no vast amounts of actuarial reserves in assets major managing companies handle. They are scarcer than reserves of non-governmental pension funds, military mortgage, etc. However, they are far to be the last to mention. Managing companies hold different percentage of actuarial reserves. For example, they account for 4.7 percent of Sberbank Assets Management's assets, 7.5 percent of Reiffeisen Capital's assets and 0.28 percent of Alfa Capital's assets.

¹¹ Data of the National Association of Stock Market Actors (NAUFOR). URL: http://nlu.ru/stat-count_pifs.htm (In Russ.)

Top-15 managing companies, in terms of net assets under trust management, take 94 percent of the trust management market. Therefore, the information about actuarial reserves they hold allows to make quite a reliable judgment how many actuarial reserves may be held in trust management. The above companies handle RUB 78,420 million which they obtain from insurers as reserves, i.e. only 7.34 percent of total actuarial reserves of the insurance market¹².

Regulating financial markets, authorities demonstrate a consistent tendency of protecting investors' rights and interests, contributing to the complete disclosure of trust managers' information, reducing fraud instances as much as possible. Making an investment portfolio for its customer, the managing company is guided by the rate of return the customer expects to get and probable tolerable loss. If the risk exceeds the tolerable threshold as part of portfolio management, the managing company informs the insurer of it in order to jointly adjust and amend the investment strategy they should follow. There are also firm principles managing companies should adhere to when informing the customer of the value of an investment portfolio and its overall performance [10].

The return on such investment is most lucrative in comparison with other types of investment. Although it fails to generate 100 percent of return annually, it is still higher than the inflation rate and return of conservative instruments in the majority of cases. Virtually, mutual investment funds have a sectoral dedication, facilitating a choice of mutual investment funds to invest in and allowing decision-makers to focus on a specific sector. The trust management market provides robust analytical mechanisms concerning investment as compared with the insurance market since insurers are meant to insure, while investment is secondary and additional.

Currently, the Russian trust management market has not lured many insurers into. Nevertheless, it has the very good potential, from perspectives of insurers and legislature. As noted in the research¹³, trust management of assets is a very effective solution

¹² Ratings and rankings of mutual investment funds and managing companies. URL: <http://investfunds.ru/> (In Russ.)

¹³ Osmanov R.R. [The future of trust management of insurance companies' actuarial reserves through mutual investment funds]. *Aktual'nye voprosy finansov i strakhovaniya Rossii na sovremennoy etape: materialy nauchnoy konferentsii* [Proc. Sci. Conf. Current Issues of Finance and Insurance in Russia Today]. Nizhny Novgorod, Minin University Publ., 2016, pp. 84–87.

promising the high returns for the decision-maker (as compared with bank deposits and bonds which insurers mostly prefer) and turns out to be beneficial for both parties (insurers and managing companies).

What inhibits the development of this practice is an insufficient track record of the Russian investment institutions due to the recent transition to the market economy and ranging difference of the rate of return mutual investment funds offer, which results from the instability of certain sectors of the Russian economy, especially during the current economic and political tensions.

Conclusion

Voluntary insurance and long-term life insurance in particular become the land of opportunities for the Russian insurance companies. Insurers accumulate substantial actuarial reserves for long-term life insurance, while their equity and accumulation of capital increase in the insurance market. Considering the stringent legislative regulations, insurers have to observe requirements of the Central Bank of Russia and

optimize their investment portfolio. Investing activity of the Russian insurers demonstrate the high efficiency level, thus enabling them to resist the inflation. Insurers may interact with other financial institutions (banks) on specific terms, which provides additional advantages for both parties. They enjoy such opportunities.

Despite the satisfactory rate of return and high efficiency of investing activity, there are still methods to improve it. Entering the banking sector is the main course for investing activities to follow. Investing in banking generates less profit, but it is more reliable and liquid, providing additional opportunities, such as growing insurance premiums, clientele, financial instruments to invest in.

Having its own legislative framework, trust management of some actuarial reserves may help optimize the investment portfolio. The Russian insurers have not yet mastered this option completely, though it is a new and promising solution. Trust management of some actuarial reserves will boost the return on investment, notwithstanding their more risky nature.

Table 1

Trends in insurance premiums in Russia, 2014–2017

Growth (Drop) rates of insurance premiums, percentage points	2014	2015	2016	2017
Overall insurance	9.2	3.6	15.3	8.3
Voluntary insurance	9.4	-4	18.4	23.8
Compulsory insurance	7.9	37.6	5.2	-5
Life insurance	27.8	19.5	66.3	53.7
Insurance, other than life insurance	7.1	-7.5	8.9	-0.8

Source: Authoring

Table 2**Trends in actuarial reserves of the Russian insurance companies, 2012–2016**

Metrics	2012	2013	2014		2015		2016		
	Million RUB	Million RUB	p.p.						
Life insurance	70,395	100,822	43.2	159,686.4	58.4	232,930	45.9	354,052.1	52
Insurance, other than life insurance	577,116	630,503	9.3	737,740.8	17	739,951	-0.2	782,075.6	5.6
Actuarial reserves, total	647,511	731,325	12.9	897,427.2	22.7	972,881	8	1,136,727.8	16.7

Source: Authoring**Table 3****Trends in equity of the Russian insurance companies, 2012–2016**

Metrics	2012	2013	2014		2015		2016		
	Million RUB	Million RUB	p.p.	Million RUB	p.p.	Million RUB	p.p.	Million RUB	p.p.
Equity	325,648	363,968	11.8	387,471	6.46	395,135	1.3	461,987.3	16.8
Authorized capital	198,644	224,157	12.8	220,192	-1.8	189,822	-13.8	216,362.4	21.2

Source: Authoring**Table 4****The composition of insurance companies' insurance portfolio, 2014–2016, percentage**

Metrics	2014	2015	2016
Bank deposits	18.3	24.7	26.1
Receivables	18.9	19	17.7
Bonds	13.2	15.6	17.4
Percentage of reinsurers in actuarial reserves, including	10.4	8	8
Monetary funds	10.8	7.9	6.2
including			
– denominated in the Russian rubles in accounts with credit institutions	8.7	5.3	4.2
– denominated in foreign currency in accounts with credit institutions	1.9	2.6	1.9
– cash	0.08	0.03	0.02
Governmental and municipal securities	6.1	6.4	8.9
Stocks	8.1	7.2	6.6
Real estate	5.7	5.1	4.2
Unit investment of mutual investment funds	1.3	0.9	0.6
including			
– promissory notes	1	0.5	0.09
– other assets	6.1	4.9	4.2
– assets	100	100	100

Source: Authoring

Table 5**Return on investment and results of investment transactions, 2012–2016**

Показатели	2012	2013	2014	2015	2016
Return on Investment, total, million RUB	958,264.1	582,154.7	544,419.7	470,879.4	737,074.9
including					
– interests receivable	27,647.1	49,137.7	45,096.7	61,191.5	75,050.1
– income from shareholdings, million RUB	42,071.9	19,560.1	33,205.4	23,466.8	14,904.8
– changes in the value of financial investment due to adjusted valuation, million RUB	10,029.9	6,347.1	21,182.3	32,713	21,115.4
Result of investment transactions (+, –), million RUB	34,109.4	36,759.3	37,608.4	87,065.4	75,546.3
including					
– from actuarial reserves, million RUB	23,314.5	25,170.6	33,360.4	75,357	49,371.9
Life insurance	5,910.3	5,681.1	4,193.5	23,310.3	10,867.1
Efficiency of actuarial reserves as a source of investment, percent	3.6	3.4	3.7	7.7	4.3
Efficiency of actuarial reserves for life insurance as a source of investment, percent	8.4	5.6	2.6	10	3.1

Source: Authoring

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Translated Article[†]

THE SCENARIO-BASED APPROACH TO TRADE IN OPTION CONTRACTS

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mef1@tpu.ru**Article history:**Received 10 September 2018
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G24**Keywords:** scenario-based
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geometric motion, call option**Abstract****Subject** Nowadays, traditional methods may hardly forecast how prices for assets will go. The scenario-based approach becomes more widely spread in various sciences, including financial mathematics. The key idea of the scenario-based approach is a scenario tree representing the hierarchical structure of data, outlining how things may unfold, and evaluating the probability. This approach helps model various scenarios of the future situation, thus allowing to make appropriate decisions.**Objectives** The research produces a one-period scenario tree showing how the price for the asset may develop. We also analyze the sensitivity of the parameter influencing the number of descendants of vertices.**Methods** The research is based on the economic-mathematic model of the geometric (Brownian) motion, which is expressed through the stochastic differential equation. The model and sensitivity analysis are implemented in MATLAB. We also applied methods of comparative and static analysis, graphic interpretation.**Results** We constructed a one-period scenario tree for a change in the options price. Having analyzed the sensitivity of the descendant vertex parameter, we determined the optimal range of option strike price intervals.**Conclusions and Relevance** We chose the geometric motion model as the basis for the scenario-based approach since it helps construct the one-period scenario tree. This approach allows to evaluate the scenario probability. However, its weakness is that it generates the unoptimal number of descendant vertex of a tree. Furthermore, the market situation requires to test the asset for liquidity through various metrics. For example, the number of deals and trading volume.

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Introduction

Due to uncertainty in the financial market and distant investment horizon, traditional forecasting methods

often cause substantial errors and inaccuracy. This directly results from human interference into the interpretation of initial data. The scenario-based approach is very efficient since it implies the examination of key scenarios of future developments. The scenario-based approach came into practice in various areas, i.e. strategic planning and risk analysis

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[1–3], management and portfolio investment, financial mathematics [4, 5].

This research continues the previous studies [6, 7] which constructed complex portfolios of stock options [8, 9]. The key idea behind the studies was to address issues of linear programming and measure the optimal number of assets. However, those studies failed to consider possible changes in prices for underlying assets over time. The scenario-based approach takes this fact into account indeed. The research focuses on this aspect.

The Development of the General Methodology for the Scenario-Based Approach

The scenario-approach methodology originated in the 1960s. There appeared the first definitions of *scenario* and methodological framework for analysis. The pioneering studies were devoted to forecast of oil prices [10, 11], political and social processes [12]. Other proceedings delve into the essentials of the scenario-based approach in strategic management and decision making, psychological aspects of scenario development.

The studies point out several fundamental purposes of the scenario analysis:

- 1) foreseeing possible losses in the future in line with various factors¹;
- 2) identifying the appropriate and suitable strategic decision in a respective case [13];
- 3) revising the current decisions and knowingly adjust them for the future situation.

Fig. 1 summarized two approaches to unfolding the concept *scenario* as the literature analysis shows. In the first column, the concept *scenario* is viewed from perspectives of predicting probabilities of the future strategies, whilst in the second column the necessity of methods is emphasized.

The term *scenario* is often used incorrectly, meaning *forecast* and *vision*. However, as the definitions in *Fig. 1* show, scenario is not forecast, i.e. the description of the relatively predictable outcome of the current events. In the mean time, scenario is not a vision, i.e. a view of the desirable future. Scenario shall be a possibility to find a

reasonable, elaborate and, more often than note, estimated answer to the *what-if* question.

Fig. 2 illustrates a fundamental comparison of three concepts – vision, forecast and scenario [14]. We should note that what differentiates *scenario* from the other two notions is an opportunity to manage risks, whilst *vision* and *forecast* imply the tendency of concealing them.

According to the main classification of scenarios, there are two types of them [14]:

- 1) *prospective scenarios* reflect a process as if development trends remain unchanged;
- 2) *normative scenarios* outline alternative ways of attaining desired goals and forecast how the goals can be achieved.

Let us understand the scenario tree as a variety of possible outcomes in the future and assessment of the probability of each interim and resulting scenarios.

Making the scenario tree, we necessarily determine the optimal number of relevant sets. M. Porter suggests taking a set of three scenarios – the best-case, worst-case and base (as the most probable) scenarios. According to the research referred to herein [15], the above classification is far from being perfect since the base scenario may conflict with the other two. To eliminate the controversy, the author suggest setting two or three macrosenarios, which would subsequently engender their individuals scenarios, thus ensuring the logic consistency of the tree. The studies exemplify how scenario trees are made [16–18].

Another study [19] describes a methodological approach to making a scenario tree for a portfolio of option contracts, considering the probabilistic weight of a path from one vertex to the other one. However, the model has a *narrow point* of measuring the value σ determining the number of tree vertices at each step (the interval width of the strike price of options). In the study, researchers fail to verify the liquidity of strike prices in the real market. We are going to assess the model in more detail, conduct a sensitivity analysis of the value and check the liquidity of the resultant strike prices. Whereas this research continues the studies of other authors [6, 7], we choose the price for options in RTS futures contracts as the underlying asset.

¹ Neilson R., Wagner C. Strategic Scenario Planning at CA International. *Knowledge Management Review*, 2000, no. 12, pp. 4–21.

The Mathematical Model for a Scenario Tree

The linear Bachelier model is the simplest model of the underlying asset price [20]:

$$S_t = S_0 + r \cdot t + \sigma \cdot W_t, \quad (1)$$

where S_t is the asset price, S_0 is the initial asset price, r is a risk-free interest rate, σ is volatility, W_t is the Wiener process.

It was L. Bachelier who performed the first empirical research verifying the random walk hypothesis. Under the random walk hypothesis, the financial result of investment in assets has no serial correlation, and the probability of such random walks tend to be invariant. The Bachelier model (1) has a serious drawbacks as it may produce the negative value of S_t .

The Brownian motion (geometric, economic) [21] is believed to be more realistic, where S_t is expressed as a stochastic differential equation:

$$dS_t = r \cdot S_t \cdot dt + \sigma \cdot S_t \cdot dW_t \quad (1)$$

or

$$\frac{dS_t}{S_t} = r \cdot dt + \sigma \cdot dW_t. \quad (2)$$

Applying the Itô's lemma², we find the differential of $\ln S_t$ for the expression (2):

$$d \ln S_t = \left(r - \frac{\sigma^2}{2} \right) dt + \sigma \cdot dW_t. \quad (3)$$

Having performed the integration of the expression (3) within the interval $[0; t]$, we arrived at the solution of the equation (2) as:

$$S_t = S_0 \cdot \exp \{ H_t \}, \quad (4)$$

where

$$H_t = \left(r - \frac{\sigma^2}{2} \right) \cdot t + \sigma \cdot W_t = \ln \left(\frac{S_t}{S_0} \right);$$

$H = (H_t)_{t \geq 0}$ is the process of the Brownian motion³ with the volatility σ^2 and local drift

$$\left(r - \frac{\sigma^2}{2} \right).$$

The latter is a characteristic of the average pace at which the process $H = (H_t)_{t \geq 0}$ changes, with the random value being

$$H_t \sim N \left((r - \sigma^2), \sigma^2 \cdot t \right), \text{ and}$$

$$S_t \sim \log N \exp \{ r \cdot t \} \cdot S_0, \\ \exp \{ 2 \cdot r \cdot t \} \cdot S_0^2 \cdot \exp \{ \sigma^2 \cdot t \} - 1.$$

The Wiener process W_t shall mean a mathematical model of the ordinary Brownian motion, as set by N. Wiener in 1923 [22] relying upon the proceedings by L. Bachelier [20]. It is noteworthy that W_t constitutes the random walk model with the uninterrupted trajectory and time and independent Gaussian (normally distributed) increments.

We adhere to the following rules when constructing the scenario tree.

- At step $\tau = \overline{1, t}$, the first (last) descendant vertex corresponds to the highest (lowest) possible price for the underlying asset.
- The underlying asset price in neighboring descendant vertices shall differ by the value $\Delta > 0$, which is equal to a price increment of the underlying asset.
- Logarithms of the ratio of the underlying asset prices in the first $S_{(n, \tau)}^1$ and the last $S_{(n, \tau)}^{N(n, \tau)}$ descendant vertices to the underlying asset price in the respective ancestor vertex $S_{(n, \tau)}$ shall cover the entire interval $[a_\tau; b_\tau]$:

$$H^{N(n, \tau)(n, \tau)} = \ln \left(\frac{S_{(n, \tau)}^{N(n, \tau)}}{S_{(n, \tau)}} \right) < a_\tau, S_{(n, \tau)}^{N(n, \tau)} < S_{(n, \tau)} \text{ and}$$

$$H_{(n, \tau)}^1 = \ln \left(\frac{S_{(n, \tau)}^1}{S_{(n, \tau)}} \right) > b_\tau, S_{(n, \tau)}^1 > S_{(n, \tau)}, \quad (5)$$

where $N_{(n, \tau)}$ is the number of descendants of the ancestor vertex (n, τ) .

- The lower and upper edges of the interval $[a_\tau; b_\tau]$ are determined through the following formulas:

$$a_\tau = \left(r - \frac{\sigma^2}{2} \right) \cdot \left(\frac{t_\tau}{td} \right) - \delta \cdot \sigma \cdot \sqrt{\frac{t_\tau}{td}}, \\ b_\tau = \left(r - \frac{\sigma^2}{2} \right) \cdot \left(\frac{t_\tau}{td} \right) + \delta \cdot \sigma \cdot \sqrt{\frac{t_\tau}{td}}, \quad (6)$$

where t_τ is the number of days prior to the following step $(\tau+1)$; td is the number of trading days a

² Piskunov N.S. *Differentsial'noe i integral'noe ischisleniya* [Differential and integral computations]. Moscow, Fizmatlit Publ., 1996, 416 p.

³ Volkov I.K., Zuev S.M., Tsvetkova G.M. *Sluchainye protsessy* [Random processes]. Moscow, Bauman MSTU Publ., 1999, 448 p.

year; δ coefficient is measured with the desired probability Pr that the underlying asset price will fall within the interval $[a_\tau; b_\tau]$.

Let us assess the conditional probability $p_{(n,\tau)}^i$ that the descendant vertex i will proceed from the ancestor vertex (n, τ) in accordance with the rule:

$$p_{(n,\tau)}^i = \begin{cases} 1 - N(x_-^i), & i = 1 \\ N(x_+^i) - N(x_-^i), & i = 2, \overline{(N_{(n,\tau)} - 1)} \\ N(x_+^i), & i = N_{(n,\tau)} \end{cases} \quad (7)$$

where

$$N(x_{\pm}^i) \sim \left((r - \frac{\sigma^2}{2}) \cdot \frac{t_\tau}{td}, \sigma \cdot \sqrt{\frac{t_\tau}{td}} \right).$$

The value of x_{\pm}^i is measured with the formula below

$$x_{\pm}^i = \ln \left(\frac{S_{(n,\tau)}^i \pm \Delta/2}{S_{(n,\tau)}} \right). \quad (8)$$

The number of descendants of the ancestor vertex is expressed as

$$N_{(n,\tau)} = N_{(n,\tau)}^{up} + N_{(n,\tau)}^{down} + 1. \quad (9)$$

$N_{(n,\tau)}^{up}$ denotes the number of descendants of the ancestor vertex (n, τ) for which the inequation is true $S_{(n,\tau)}^i > S_{(n,\tau)}$, $N_{(n,\tau)}^{down}$ is the number of descendants of the ancestor vertex (n, τ) for which the inequation $S_{(n,\tau)}^i < S_{(n,\tau)}$, $i = \overline{1, N_{(n,\tau)}}$ is true.

The probability of the scenario is determined as follows.

$$P_v = \prod_{t=2}^T p_v^t, \quad (10)$$

where p_v^t is the conditional probability that the ancestor vertex will generate a descendant at the step t in case of the scenario v , $t = \overline{2, T}$, $u = \overline{1, N}$.

For controlling the measured probabilities of the scenarios P_v and probabilities of descendants proceeding from the vertex (n, τ) , the following normalization conditions should be in place respectively:

$$\sum_{v=1}^N P_v = 1 \text{ and } \sum_{i=1}^{N_{(n,\tau)}} p_{(n,\tau)}^i = 1. \quad (11)$$

Numerical Performance

Continuing the research indicated herein [6, 7], we focus on the following task. We need to make a financial portfolio of call options contracts for short-term investment of monetary funds. In this case, at the first step the scenario tree should be constructed to show how the price for the underlying asset changes. The second step is about the optimization [6, 7].

In this article, we give a numerical example of the scenario tree construction. The futures contract for RTS index is the underlying assets for purposes of this research. Whereas we deal with short-term investment, the two-step procedure will be performed, taking $T = 2$ and $t_\tau = 22$ days. The risk-free interest rate r is accepted as the lowest short-term rate on RUB-denominated direct REPO transactions through auctions with the Central Bank of Russia: $r = 7.25$ percent. The volatility is chosen from the volatility curve graph: $\sigma = 24.51$ percent. The rest of the parameters are presented in *Table 1*.

As per the formula (2), the value of options contracts depends on the price of the underlying asset, risk-free interest rate, volatility and period before vesting. Therefore, the risk-free interest rate and volatility are permanent values, while some random process ξ_t describes only changes in the price for the underlying asset.

As a result of the modeling process, we constructed the scenario tree. *Fig. 3* depicts its concise form. *Table 2* indicates all resultant probabilities of the scenarios.

The resultant tree reflects the development of a random process ξ_t for two steps ($T = 2$). The state of the process at each step is presented as numbers above the tree peaks. At the step $\tau = 1$, the root vertex (1,1) has the value of $S_{(1,1)} = 107,500$ points. At the step $\tau = 2$, the ancestor vertex $N_{(1,1)}$ has 16 descendants. Then ξ_t can turn into any value $S_{(1,1)}^i$ within the interval $[90,000; 127,500]$ with an increment of the underlying asset price equal to $\Delta = 2,500$ points.

Branches of the scenario tree show the probability of transit from an ancestor vertex to a descendant vertex. For example, at the step $\tau = 2$, the conditional probability of the descendant vertex i proceeding from the ancestor vertex (1,1) equals 0.0139. In the mean time, the conditional probability of the fifteenth descendant vertex proceeding from the ancestor vertex (1,1) equals $p_{(1,1)}^{15}$ is 0.0151.

As per the formula (10), the probability of the scenarios will be as follows: $P_1 = 0.0139$, $P_{15} = 0.0151$. The normalization conditions (11) are met for the values given in Table 2.

The Effect of δ on the Interval Width of Strike Prices

The liquidity of the derivatives market influences and respectively limits the use of the resultant scenario tree. It may be that the probability of the resultant scenario is more than zero, but the scenario is *a priori* unfeasible and impracticable. The liquidity of options contracts are measured with the open interest (Fig. 4) and trading volume (Fig. 5).

Open interest represents the total number of contracts that are not closed or delivered, continuing to exist as of the current date and being due in the future definite period. The assumption is that if the buyer and seller agreed on a contract, the open interest value increased by two contracts (one from each party). Fig. 4 presents a graph reflecting the number of open positions for call options on RTS index futures contracts per various strike prices as of the scenario tree date (corresponding with Table 1).

Trading volume shows the number of contracts concluded within a certain period of time (day, week). If trading volume with respect to some strike price under the options contract increases, it signifies the arising interest of the market actors and raises its liquidity respectively. Fig. 5 displays the graph of trading volume for the call options contract on the RTS index futures per different strike prices as of the scenario tree date (corresponding to Table 1). Fig. 4 and Fig. 5 shows that the options contract with the strike price of 107,500 points corresponds with the largest number of open positions and trading volume. It is due to the fact that the value of $S_{(1,1)}$, i.e. 107,500 points, is the central strike price [23].

Let us consider the economic interpretation of coefficients in the formula (4). The r -coefficient serves as the value of the potential asset growth. The expression $(r - 0.5)$ is average of the instant pace of change in a random process $H = (H_t)_{t \geq 0}$. The coefficient σ^2 determines the diffusion of the instant pace of change in the financial result (volatility). The base rule for selecting the value δ is called *the three sigma rule*.

Let us substitute the mathematical expectation of a random value with the normal distribution, taking it as $m = E(H_t)$. Then as seen in the distribution curve, 99.7 percent of all possible outcomes with respect to the underlying asset price as of the vesting date of the options contract will lie within the range of three standard deviations ($\delta = 3$), and 95.4 percent will fall within the range of two standard deviations⁴:

$$Pr(-2\sigma < m < 2\sigma) = 0.954; \delta = 2;$$

$$Pr(-2.326\sigma < m < 2.326\sigma) = 0.98; \delta = 2.326;$$

$$Pr(-3\sigma < m < 3\sigma) = 0.997; \delta = 3.$$

Assigning different values to δ , we assess the extent to which this parameter influences the interval width $[a_\tau; b_\tau]$. The values of the remaining parameters of the model correspond with the previous ones (Table 1). Fig. 6 presents the graphs showing the distribution of the modelled probabilities for various values of δ . The parameter δ evidently influences the interval width $[a_\tau; b_\tau]$ and the number of descendants $N_{(n,\tau)}$ proceeding from the ancestor vertex.

The probability distribution graph is not symmetric (Fig. 6) against the central strike price of 107,500 points. It also demonstrates the right-hand drift of curves. This is evidence of a strong probability of growth in the underlying asset price, rather than a drop. This assumption is empirically corroborated (Table 3).

As per Table 3, the scenario tree has more *rising* descendants $N_{(n,\tau)}^{up}$ than *falling* ones $N_{(n,\tau)}^{down}$ (we mean an increase and decrease in the price for the underlying asset). Hence an increase in the parameter δ results in a stronger probability Pr and the greater number of descendants from the ancestor vertex. The numerical outcome of modeling is given in Table 4 and Table 5.

As per Tables 2–5, the price for the underlying asset as of the options vesting date will lie within the range of strike prices:

[92,500; 125,000] with a 95.4% probability Pr ;

[90,000; 127,500] with a 98% probability Pr ;

[85,000; 135,000] with a 99.7% probability Pr .

Hence, as the parameter δ increases, the range of strike prices widens. However, such a range is not

⁴ Silant'ev S.A. *Logika optzionnoi torgovli* [Logic of trade in options contracts]. Moscow, SmartBook, I-treid Publ., 2008, 344 p.

always the best width of the strike price interval in terms of their liquidity.

As the input data show (*Table 1*), investment is made for a short-term period. According to the research indicated herein [24], it is unreasonable to *distant* values of strike prices with respect to the present-day price for the underlying asset in the case of short-term investment. Furthermore, in the case of short-term investment, a range exceeding 40 percent is not advisable. Thus, the scenario tree should be constructed for an options contract, strike prices of which range from 60 percent to 140 percent of the current price for the underlying asset.

The resultant intervals of strike prices for the three cases (*Table 3*) have a range which does not exceed 40 percent. To precise the interval, it is necessary to refer to key metrics of options liquidity, i.e. open interest and trading volume. The graphs in *Fig. 4* and *5* show the very low liquidity of options contracts with strike prices below 100,000 points. Therefore, it would be more reasonable to set the left-hand edge of the interval at 100,000 points. The right-hand edge should be set at 127,500 points ($Pr = 98\%$) or 135,000 ($Pr = 99.7\%$) indeed. Both cases are tolerable and acceptable.

Conclusion

In this research, we provided a profound description of the methodological approach to constructing scenario trees for options contract, considering the probability of transition from an ancestor node to a descendant

vertex. The geometric (Brownian) motion model underlies our numerical modeling of trends in the price for the underlying asset. Using the model, we designed the one-period scenario tree (*Fig. 3*) and measured strike prices of the options contract and their respective probabilities. The assessment of the parameter δ appeared to be a bottle neck in the use of the model since it determines a range of strike prices for the options contract. *Fig. 6* displays the log-normal distribution of probabilities in line with the three values of the parameter δ . The graph is seen to have a right-hand drift, signifying that there is a strong probability that the price for the underlying asset will be rising than falling. The fact is corroborated numerically in *Table 3*. The number of rising descendant vertices of a corresponding ancestor node $N_{(n, \tau)}^{up}$ always exceeds the number of falling descendant vertices $N_{(n, \tau)}^{down}$.

The three sigma rule ensures a strong probability that strike prices for the options contract will widely range. However, the rule still has a serious drawback. It overlooks the liquidity of the options contract with a corresponding strike price in the real market. That is the reason why various indicators should be employed since they make up a correct view of the liquidity. In this research, we analyzed two key indicators, i.e. the number of open transactions (open interest) and trading volume. As the analysis shows, strike prices below 100,000 points of the underlying asset proved to be non-marketable in case of short-term investment. Therefore, such strike prices should not be used for constructing scenario trees for subsequent steps.

Table 1**Scenario tree parameters**

Metrics	Value
Portfolio composition	Options on RTS index futures contract
Current price for the options contract $S_{(1,1)}$	107,500 points
Increment of the underlying asset price Δ	2,500 points
Number of steps T	2
Term of investment $t \tau$	22
Risk-free interest rate r	7.25%
Volatility σ	24.51%
Coefficient δ	2.326
Number of trading days a year td	247

Source: Authoring

Table 2**The probability of scenario P_v to arrive at the descendant vertex**

$S_{(1,1)}$	P_v
90,000	0.0095
92,500	0.0151
95,000	0.0304
97,500	0.0527
100,000	0.0793
102,500	0.105
105,000	0.1231
107,500	0.1291
110,000	0.1218
112,500	0.1043
115,000	0.0814
117,500	0.0584
120,000	0.0386
122,500	0.0237
125,000	0.0135
127,500	0.0139

Source: Authoring

Table 3**The number of descendants of the ancestor vertex in line with three values of δ**

Metrics	Value of δ		
$Pr, \%$	95.4	98	99.7
$N_{(n,\tau)}^{up}$	7	8	11
$N_{(n,\tau)}^{down}$	6	7	9
$N_{(n,\tau)}$	14	16	21
Interval of strike prices	[92,500; 125,000]	[90,000; 127,500]	[85,000; 135,000]

Source: Authoring

Table 4**The modeling outcome for $\delta = 2$**

$S_{(1,1)}$	P_v
92,500	0.0247
95,000	0.0304
97,500	0.0527
100,000	0.0793
102,500	0.105
105,000	0.1231
107,500	0.1291
110,000	0.1218
112,500	0.1043
115,000	0.0814
117,500	0.0584
120,000	0.0386
122,500	0.0237
125,000	0.0275

Source: Authoring**Table 5****The modeling outcome for $\delta = 3$**

$S_{(1,1)}$	P_v
85,000	0.0009
87,500	0.0023
90,000	0.0064
92,500	0.0151
95,000	0.0304
97,500	0.0527
100,000	0.0793
102,500	0.105
105,000	0.1231
107,500	0.1291
110,000	0.1218
112,500	0.1043
115,000	0.0814
117,500	0.0584
120,000	0.0386
122,500	0.0237
125,000	0.0135
127,500	0.0072
130,000	0.0036
132,500	0.0017
135,000	0.0013

Source: Authoring

Figure 1The general view of approaches to revealing the *Scenario* definition

Approach 1	Approach 2
1. Internal perception of the future. It is not forecast but rather some version of the possible future consequence (1985, M. Porter) 2. An array of diverse but rather probable events in the future (1996, Vender Heijden) 3. Sequence of events, which may possibly take place in the future (1998, M. Jarke) 4. A set of strategies with the different outcome in the future (2000, Roubelat)	1. The reasonable method to search for various strategies of the future (1995, P. Shoemaker) 2. A tool to streamline alternative scenarios of the future

Source: Authoring

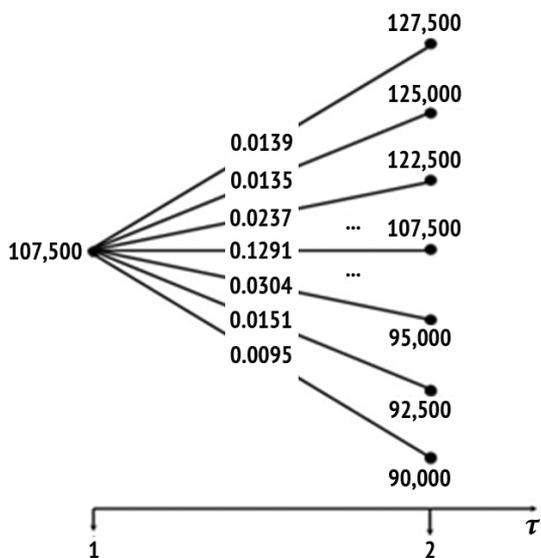
Figure 2Comparison of three concepts, *Vision*, *Forecast*, and *Scenario*

Vision	Forecast	Scenario
The desired outcome in the future	The probable outcome in the future	Possible but the most probable outcome in the future
Urging to decide	Helping to date and decide	Serving to get a sound understanding a choice to be made
Key Characteristics		
Based on personal values	Based on ties arranged in a specific fashion	Based on uncertainty
Risks are concealed		Risks are showed
As a rule, focusing on the quality	Mainly focusing on the quantity	Focusing on both quality and quantity
Use		
Relatively frequent		Seldom
Efficiency		
A launching mechanism for the future deliberate transformations	For the short-term interval Possible but the most probable outcome in the future of time (low uncertainty)	For the mid-term and long-term interval of time (high or medium uncertainty)

Source: Authoring

Figure 3

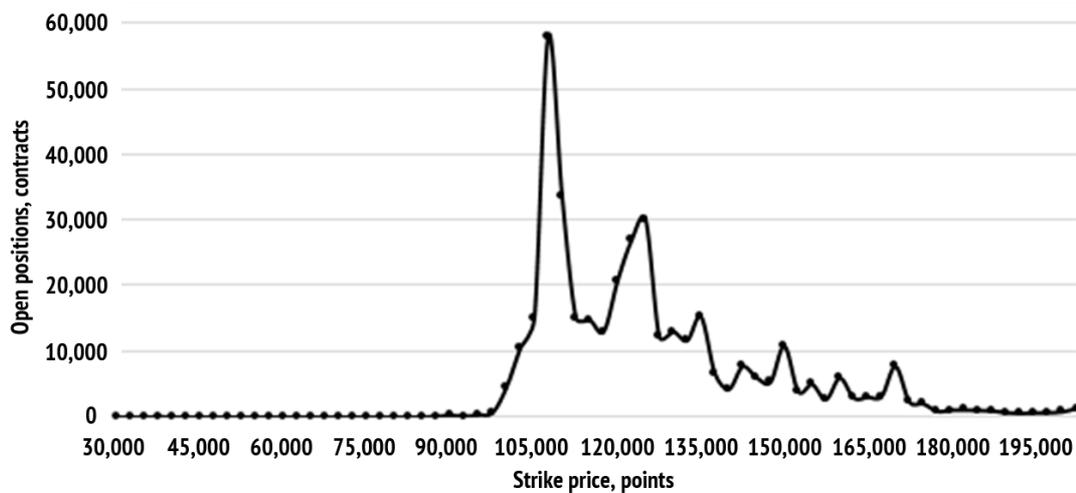
The scenario tree for numerical implementation



Source: Authoring

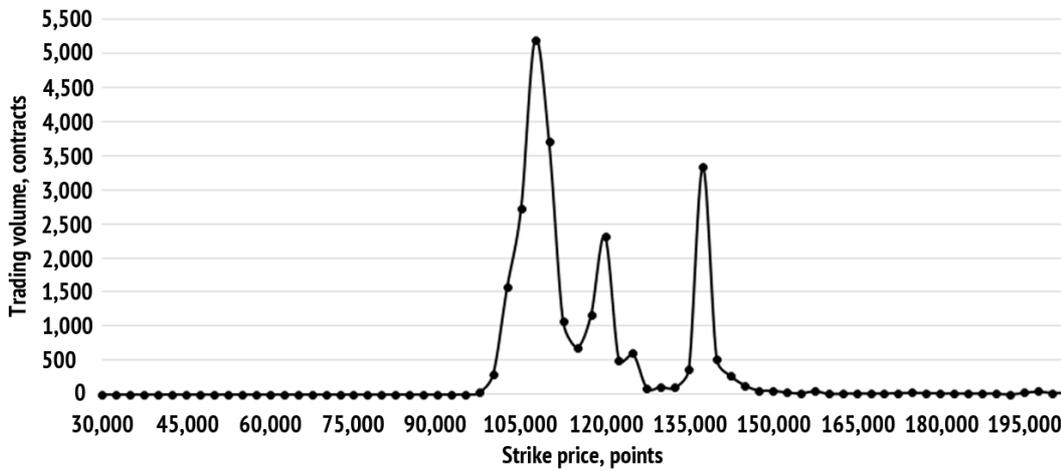
Figure 4

The declared interest in an option on the RTSI futures contract



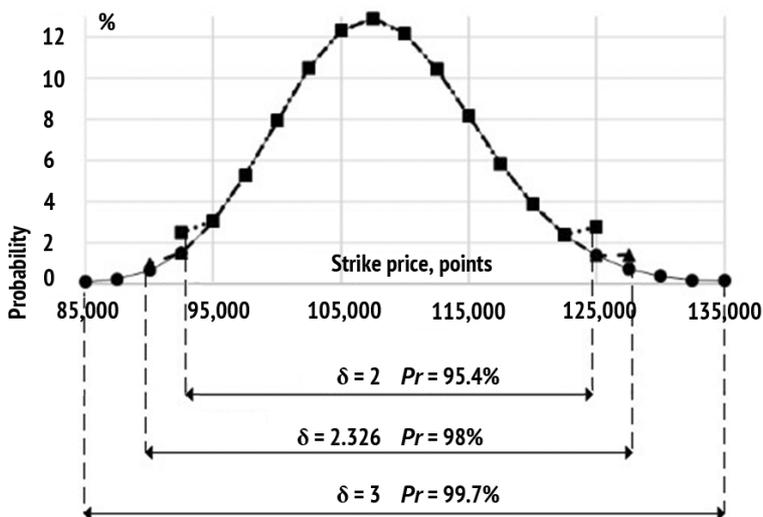
Source: Authoring

Figure 5
Trading volume under the option on the RTSI futures contract



Source: Authoring

Figure 6
The distribution of probabilities in case of different values of δ



Source: Authoring

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Translated Article[†]

CONTEMPORARY FINANCIAL CONTROL: CHALLENGES, CONTRADICTIONS AND DIGITAL TOOLS FOR DEVELOPMENT



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Abstract

Subject This paper discusses the perspective development of modern financial control instruments due to the increasing digitization of the financial system. The paper also examines the challenges and contradictions facing financial control at the present time.

Objectives The paper aims to justify the need for advanced financial control through embedding in the ecosystems of financial markets and digital financial infrastructure with the preservation and development of its external character.

Methods For the study, we used methods of generalization and structural design.

Results The paper says that the main contradiction of the modern financial control is the increasing discrepancy of its organizational and managerial forms to the challenges of financialisation and digitization. The paper proposes to form adapted digital instruments.

Conclusions and Relevance Development of priorities of modern financial control is involves its new organization on the basis of principles of openness, permanence and universality of all participants of financial relations. The results obtained can be used to supplement the implemented main directions of financial technologies development with the system set of digital instruments of financial control.

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Growing outstrippingly fast, financial components play a special role among multiple characteristics of the recent economic development (post-industrial, economy of knowledge, digital, etc.), which are differently construed by scholars and experts. The latter fact is almost generally accepted.

As financial components grow systemically important for business operations, the substance and forms of financial relationships have a tendency to gradually transform as well. On the one hand, no changes are seen in the main characteristics of financial relationships, such as the monetary form, stringent purpose and use, link to distributing and redistributing tools and institutions. On the other hand, the economic environment and totality of designation and practical use goals undergo crucial changes, that cannot but influence the substance.

Finance and financial relationships are conventionally believed to translate their substance through their systemic functions of national reproduction. Notwithstanding the existing variety of functions finance play, there are two fundamental ones, i.e. distribution and control.

The distribution function is known to stem from the need to allocate results of economic activities (new value added, gross domestic product, etc.) in line with the public and national demand, which depends on primary, secondary and ultimate flows of income. Money serves to control that income from distribution processes throughout levels of financial relationships be completely, correctly and timely utilized, thus having an organizational effect on the financial control system. As pointed out in some cases, functions of finance, which include stimulation, stabilization, taxation, accumulation and so on, are actually derivative or hybrid of relationships typical of other economic relationships.

Digital development processes gain momentum in the time of a considerable socio-economic transformation, thus altering the substance of both functions. However,

while the first primarily entails further improvement and development of distribution processes throughout levels of financial relationships, the latter changes drastically. The reason is that financial control strongly implies forecasting, collection of the complete information about the formation of funds, their stringent and purposeful use, and its effective processing. It is hard to deny that there should be proper conditions for big data processing. Therefore, organizational principles of financial control should be amended respectively.

This is the function of control that faced new challenges brought about with the economic development. Those challenges include inter alia the financialization of economy nationally and globally [1, 2].

Generally, financialization blends key macroeconomic trends, i.e. an outstripping growth in gross domestic product (GDP) as seen for the recent decades and investment in the real economy (primarily in capital stock) [3]. Such a macroeconomic situation resulted from the public wellbeing that improved in advanced economies in the last fifteen years of the 20th century due to the performance of public capitalism principles among other things. People put aside an increasing amount of money during a long period of time, which was naturally represented with various securities and some other stock instruments. The process stalled only after the 2007–2009 financial crisis. The financial sector saw a respective upswing in investment deals respectively.

As mentioned in scholarly literature, the par value of global financial assets demonstrated a seven-fold increase during the 1995–2015 period, from USD 42 up to 294 trillion. The increase was concomitant with a growth in the ratio of the assets to global GDP, from 195% up to 375%. These trends were slightly affected by the global financial crisis since they continued to prevail. The growing ratio of financial assets to investment in fixed capital became one of the hallmarks of the post-crisis recovery. The capitalization of stock markets of the USA, European Union, United Kingdom and Japan almost doubled within the period from 2009 through 2015, while total assets of central banks showed a 1.5-fold increase [4]. Steadily rising financial flows against a growth in the real economy, which

[†]For the source article, please refer to: *Татиев А.А., Овчарова Н.И., Галюта О.Н., Залевская М.А. Современный финансовый контроль: вызовы, противоречия и цифровые инструменты развития // Финансы и кредит. 2018. Т. 24. № 12. С. 2661–2677. URL: <https://doi.org/10.24891/fc.24.12.2661>*

currently gain momentum, being noted in the report of the UN experts' on trade and development'¹.

Such trends took their course in the Russian economy, however being more distorted in some cases. The processes turned to be especially dramatic concerning the ratio of investment in non-financial assets to financial investment (*Fig. 1*).

On the one hand, the situation illustrates interpretations of economic crises, which were common in the late 20th century. According to such interpretations, a cause-and-effect relationship arises when financial relationships based on the development and stability of the system morph into those ones pursuing the speculative income during the period of active economic growth, thus undermining the stability of the national economy [5].

As parties to financial relationships rearrange their goals during the seemingly sufficient economic growth, the market sees the expansion of speculative financial assets saved, respective debts with underestimated risks. This, first directly and subsequently indirectly, paves the transition from hedged leverage to speculative forms of debt financing [6]. The market value of speculative assets unavoidably decreases, triggering the active deployment of the Ponzi scheme (financial pyramid) or sale of similar assets and obvious impairment of all types of assets. Both processes shatter the financial stability of the economic system.

On the other hand, it is worth mentioning herein that the specific problem of financial control arises when many budgetary expenditures convert into speculative financial assets. Refer to *Fig. 1* again to see that trillions the State injects into the banking system of Russia during the global financial crisis and sanctions imposed had almost not decreased a percentage of non-financial investment. It means purposeful budgetary spending for supporting the national financial system does not contribute to the main goal of expanded reproduction and economic growth. It is arguable and disputable whether such budgetary spending can be deemed effective in terms of financial control.

The digitization of economic and social spaces is another systemically important challenge for social development, which has a tremendous effect on financial control aspects. The concept of digital economy is not yet clearly defined, being perceived

through digital technologies used in production and manufacturing processes. Thus, in this case, we adhere to the definition of digital economy set forth in the Program, Digital Economy of the Russian Federation, as approved with Instruction of the RF Government of July 28, 2017 № 1632-p. Digital economy is understood there as an economic activity driven with data in the digital form as its key factor of production. This frames the information space in accordance with the need of citizens and society as a whole to get proper and accurate information, development the information infrastructure of the Russian Federation, creates and implements the Russian ICT, new technological platform for the social and economic life.

The above definition definitely lacks some substantive principle, other than that the digital economy is defined through the lens of prevailing technologies, i.e. digital economy – digital technologies. In the course of time, there will be sufficiently theoretical and empirical grounds to make more meaningful definitions as it happened with the interpretation of agricultural, industrial, post-industrial economy, etc.

The approach to financial aspects is based on similar logic. As set forth by the Central Bank of Russia in Principal Areas for the Development of Financial Technologies for the 2018–2020 Period in the context of the program, Digital Economy of the Russian Federation, Big Data, data analysis, mobile technologies, artificial intelligence, robotification, biometrics, distributed ledger, cloud technologies are prioritized for the financial system.

The Accounts Chamber released the 2018–2024 Development Strategy approved by its Board as part of general development paths and methodology for statutory audit and internal system of governance, human resources and organizational culture. The Strategy provides for the implementation and development of modern digital technologies for statutory audit. Following this course, first, the Accounts Chamber is supposed to carry out the digitization of its operations by creating the digital infrastructure to support the auditing and analytical practices, advance remote auditing methods, refine mechanisms and procedures for getting the feedback from the public and users of information via the digital infrastructure. Second, the Accounts Chamber should facilitate the digital transformation of the public administration through performance audit and strategic audit of governmental information systems and public data

¹ World Investment Report 2016.

URL: http://unctad.org/en/PublicationsLibrary/wir2016_en.pdf

processing systems. It should also provide guidelines for the digitization of public administration, development of governmental information systems, implementation of analytical and decision support systems based on data.

Moreover, almost every program implies digital technologies. Such a dedicated approach makes things about financial control more complicated because key substantive criteria for the purposeful and effective use of financial resources are left out of scope in modernizing the financial system and its controlling bodies. Therefore, in the current circumstances, it is important to establish new digital financial relations as the general systemic goal and a goal of the financial control development.

We should note the totality of financial market trends as the third challenge to the economic development today². They are observed in the Russian segment as well. These are low margin of banking services, financial market actors transforming their business models and striving to create the environment, broader availability of financial services due to their digital format, banks' loss of monopoly over traditional services (payment and other) and non-financial entities playing a considerable role in the financial market, banks' intention to set up partnership relationships with startups and technological companies.

The formation of the low margin financial business environment should be under special scrutiny. Financial entities are actively adapting to such working conditions. However, for purposes of this research, we should emphasize that financial control gets on the rise in the time of low economic growth and low margin. In such situations, total breaches and violations block financial resources needed for growth. To teeter between development and stagnation, there should be effective and robust financial control with the predominant analytical function.

The key contradictory feature of financial control arises, with the unfolding challenges on the background.

Currently, financial control transforms into one of the most conservative economic practices. The rise of transformational processes in financial relations and predominant preservation of the existing financial control approaches come into collision that gradually deteriorates. On the one hand, the collision results in

² Key Areas for Developing Financial Technologies within the 2018–2020 Period. Moscow, Central Bank of Russia Publ., 2018, p. 3.

the space of new financial relations, which are actually beyond effective financial control. On the other hand, audits become less effective and relevant.

It should be kept in mind that financial control issues should be considered through the lens of a dramatic change in systemic priorities of the Russian economy. In particular, the academic community continues active debates about the need to articulate a new conceptual doctrine of socio-economic development as the contemporary social development poses an increasing number of questions and problems [7, 8]. Scholars say negative factors of the contemporary world (recent recession and foreign sanctions) need to be eliminated [9–11], which respectively concern the development of financial relations. Researchers put effort into overcoming a decline in sectoral investment [12], searching new regional development tools³, ensuring the effective use of people's savings [13].

Considering the future of financial relations, we would like to indicate a well-reasoned opinion that the new economy will prioritize the creation, rather than reproduction. Hence, views on the future should encompass the coming creative revolution more than reindustrialization, which is on the top of current debates [14].

The expanding functional role of creative work may resemble the transformation of the computer industry when it became one of the main growth areas. Growing rapidly, the computer industry constantly produces new technological means and tools for the permanent creation of new products and services [15]. Moreover, it is interesting to observe that the systemic expansion of the digital sector is thought to result from rather active expansion of the so called transaction sector integrating multiple types of creative activities, i.e. public administration, finance, information support, consulting, servicing, etc.⁴

As we presume from perspectives of the subject herein, this generates new financial relationships and tools for any new investment or production project. Standardized schemes were previously used to render key financial services but now the standardization level

³ Shanin S.A. [Regional investment policy: Contemporary approaches and modernization trends]. *Belgorodskii ekonomicheskii vestnik = Belgorod Bulletin of Economics*, 2012, no. 3, pp. 16–22. (In Russ.)

⁴ Savina T.N. [Digital economy as a new paradigm of development: Challenges, opportunities, and prospects]. *Finansy i Kredit = Finance and Credit*, 2018, vol. 24, no. 3, pp. 579–590. (In Russ.)
URL: <https://doi.org/10.24891/fc.24.3.579>

subsidies, with the novelty growing much more significant in each particular case.

Concurrently with the trends, the substance and methods of financial control remain rather conservative, though being constantly updated for certain aspects.

In its more generalized presentation, financial control is perceived through a set of various types, forms and methods. When its substance is formalized through the legally regulated practice of checking the compliance with standards and requirements for effective planning, collection and use of monetary funds, it seems the most important institutions ensuring the legitimacy of financial operations and related business activities.

Financial control is within the competence of federal and municipal authorities, independent auditors and auditing forms, law enforcement bodies, internal functions of business entities. Any kind of control is generally deemed effective if the amount reimbursed and monetary and material loss prevented significantly exceed the costs incurred to organize and carry out such control [16].

The government arranges for financial control over certain aspects, which are legislatively stipulated (performance of the federal budget, money circulation process, use of debt resources and some other). Financial control is the responsibility of the Accounts Chamber of the Russian Federation, Central Bank of Russia, Ministry of Finance of the Russian Federation, Federal Service for Currency and Export Control and some other ministries and agencies. Internal control is mostly performed by accounting, financial and economic departments. Banking control of financial and credit institutions deserves a special mention since the Central Bank of Russia is authorized to conduct a wide spectrum of oversight and supervisory activities.

Control more often than not may be public (intentional efforts of citizens, political parties, mass media, public associations, etc.), independent (a set of certified auditing firms), current (ongoing activity of financial functions at all levels), follow-up (internal and independent audits of financial operations for past periods). Methods of observation, audit, examination, analysis, revision are most frequent and effective. Revision is considered as the principal method which laws abide to conduct on a statutory and regular basis. The revision is classified into documentary and factual,

scheduled and extraordinary, complete and sample-based, comprehensive or dedicated.

Abstaining from disputes about the content, goals and effectiveness of financial control [17, 18], we can see an obvious indication to static methods and modes of operations. Hence, considering that businesses tend to creative systems of management and digital technology, there arises the main inconsistency of the contemporary financial control practice. Business and legal forms of financial control more and more come into disagreement with the priority content of financial relations. If such inconsistency persists, financial control will demonstrate low efficiency.

The fact that financial audits are insufficiently effective can be illustrated with data of the Accounts Chamber of the Russian Federation. For example, the scope of breaches, which auditors detect, is almost incomparable with reimbursable amounts. So, there is no direct correlation between a growth in breaches and reimbursable amounts (*Table 1*).

Furthermore, in 2017, actual federal fiscal revenue was 2.5 percent as high as estimates, while real expenditures were 1.8 percent as low as estimates. What attracts attention is that the deficit of federal budget turned to be 33.3 percent as low as the approved one (*Table 2*).

The average federal spending was 96.5 percent, with the considerable differentiation of certain sections (*Table 3*). The Accounts Chamber of the Russian Federation especially emphasized the need to undertake more efficient measures for better planning in line with real wants and even and effective use of budgetary funds.

What is more, financial control will be further enhanced by checking the reasonableness of key macroeconomic indicators of Russia's socio-economic development forecast for 2019 and the base period of 2020 and 2021. It is also necessary to confirm whether fiscal revenue is reasonably forecasted and budgetary expenditures are effectively incurred⁵. In the mean time, new organizational measures reflecting the development of digital technologies in the public and financial sectors are almost overlooked, though there are quite good examples of new technologies in use.

⁵ Report on the performance of the Accounts Chamber of the Russian Federation in 2017. Moscow, Accounts Chamber of Russian Federation Publ., 2018, 205 p.

Russia is known to implement the joint project of the Ministry of Finance and open government, The Budget for Citizens. Currently, the open budget is predominantly considered as a platform for information support and productive dialogue between respective governmental officials and the population on the administration of public financial resources.

Moreover, we should mention that the efficacy of financial control is questionable in the case of business entities. Some researches point out that the national investment segment, especially capital expenditures on capital stock, is sluggish, which almost prevents adequate digitization reforms. As the effective Russian laws prescribe, control demonstrates the disparity. On the one hand, funds the State earmarks for investment purposes are directly subject to control. On the other hand, it is almost impossible to effectively control how entities utilize their equity for capital expenditures. It is especially true when internal auditors need to identify what mainly triggered fraud in the corporate governance system⁶.

We believe that this particular situation represents the paradox of financial control, significantly affecting the potential of public-private partnerships. While public-private partnership abroad revitalizes investment activities and makes it more effective, the expansion of the mechanism in Russia has no palpable effect on the investment process.

Therefore, financial control cannot evolve without digital technologies. Moreover, financial control should intrude into the financial system so that its outer substance would remain unchanged and continue to

evolve. Financial control should apply to all parties to financial relationships, especially in the context of blockchain. As scholarly literature puts it, new technologies make the economic construct of confidence transform, extensive practice of financial intermediation subsides and people get more involved into financial relationships [19].

As we see it, it would be effective to fit the integral financial control system into the measures stipulated in The Key Areas for the Development of Digital Technologies for the 2018–2020 Period and the program, Digital Economy of the Russian Federation.

This will arrange the practice of financial control in a new way, making it open, continuous and involving all parties, rather than revision commissions, internal auditors, accounts chambers only, etc.

The neural blockchain platform for financial control should be built in the relationships between respective parties and environments of the financial market and digital financial infrastructure in order to implement the above (Fig. 2 and 3).

The blockchain technology is a sequence of blocks representing real transactions of parties operating in the system. The blockchain technology increases the functional role of each participant as one of its main results and effects, which will especially matter for financial control.

Based on digital technologies, its common and continuous format, financial control will reduce the unintended use of limited financial resources and substantially morph into the practice of performance analysis.

⁶ Smetanko A.V., Kulyakina E.L. [Risk-based internal audit in the system of signs and causes of fraud identification]. *Finansy i Kredit = Finance and Credit*, 2018, vol. 24, no. 4, pp. 755–766. (In Russ.)
URL: <https://doi.org/10.24891/fc.24.4.755>

Table 1**Some performance indicators of the Accounts Chamber of the Russian Federation, 2015–2017**

Indicators	2015	2016	2017
Controlling, expert and analytical checks, total	322	321	319
Breaches detected during statutory audit (control), billion RUB	516.5	965.8	1,865.6
Amounts reimbursed to budgets of all the fiscal levels of the Russian Federation and system of the Union State, million RUB	10,317	8,816.8	19,151.7

Source: Authoring, based on *Otchet o rabote Schetnoi Palaty Rossiiskoi Federatsii v 2017 godu* [Report of Accounts Chamber of the Russian Federation in 2017]. Moscow, Accounts Chamber of the Russian Federation Publ., 2018, pp. 7–8

Table 2**Some macroeconomic indicators and description of changes in the federal budget of the Russian Federation for FY 2017 and their factual performance**

Indicator	Federal budget for FY 2017 adjusted and approved by Federal Law				Factually performed in 2017
	of 01.12.2014 № 384-ФЗ	of 19.12.2016 № 415-ФЗ	of 01.07.2017 № 157-ФЗ	of 14.11.2017 № 326-ФЗ	
GDP, billion RUB	90,063	86,806	92,190	92,224	92,081.9
Inflation rate, %	4	4	3.8	3.2	2.5
Revenue, billion RUB	16,547.8	13,487.6	14,678.8	14,720.3	15,087
Percentage of GDP	18.4	15.5	15.9	15.96	16.4
Expenditures, billion RUB	17,088.7	16,240.8	16,602.6	16,728.4	16,425.8
Percentage of GDP	19	18.7	18	18.1	17.8
Budget deficit (-) / surplus (+), billion RUB	-540.9	-2,753.2	-1,923.8	-2,008.1	-1,338.8

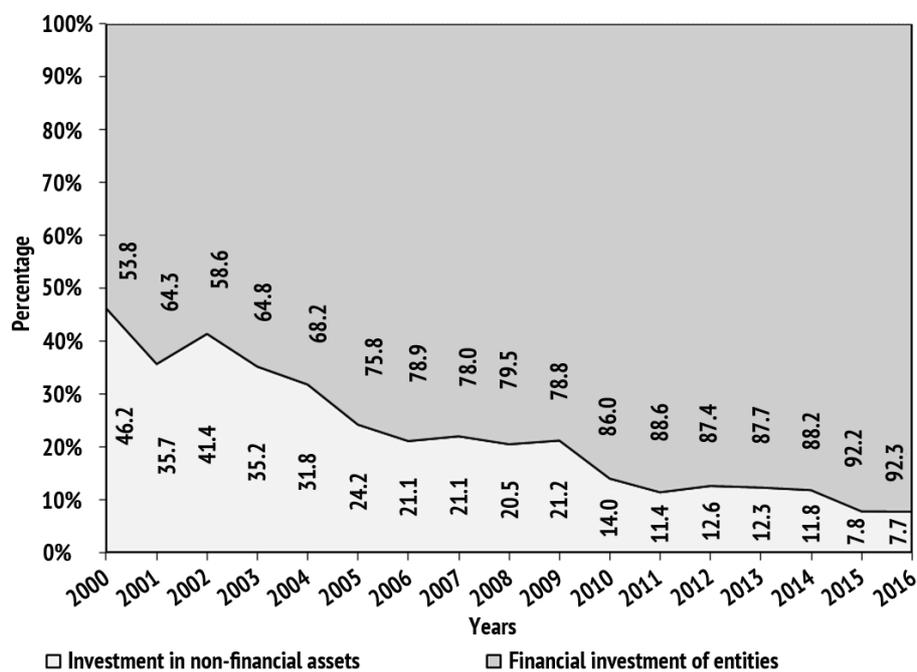
Source: Authoring, based on *Analiticheskaya zapiska o khode ispolneniya federal'nogo byudzheta i byudzhetov gosudarstvennykh vnebyudzhetykh fondov Rossiiskoi Federatsii za yanvar'-dekabr' 2017 goda* [Analytical Note on the Progress of the Federal Budget and the Budgets of State Extra-Budgetary Funds of the Russian Federation for January–December 2017]. (In Russ.)

Table 3**Analysis of federal spending by section for January–December 2016–2017, billion RUB**

Indicator	2016			2017		
	Approved	Performed from Jan thru Dec		Approved	Performed from Jan thru Dec	
		Amount	%		Amount	%
General national needs	1,127.8	1,095.6	97.1	1,248.3	1,167.2	93.5
National defense	3,806.4	3,775.4	99.2	3,059.6	2,852.8	93.2
National security and law enforcement	1,891.8	1,898.7	100.4	1,960.8	1,918	97.8
National economy	2,401.6	2,302.1	95.9	2,580.2	2,460	95.3
Housing and utilities services	75.7	72.2	95.5	124.9	119.5	95.6
Environmental protection	63.4	63.1	99.6	93.1	92.4	99.2
Education	603.2	597.8	99.1	623.1	615	98.7
Culture, cinema	90.6	87.3	96.3	98.4	89.7	91.1
Healthcare	518.6	506.3	97.6	451.9	439.9	97.4
Social policy	4,600.3	4,588.5	99.7	5 031.3	4,992.1	99.2
Physical culture and sports	67.2	59.6	88.7	102.5	96.1	93.8
Mass media	76.7	76.7	99.9	83.3	83.2	99.9
Public and municipal debt	639.6	621.3	97.1	730.3	709.2	97.1
General cross-budgetary transfers to budgets of the constituent entities of the Russian Federation and municipalities	673.7	672	99.8	829.3	790.7	95.3
Federal budgetary spending, total	16,636,4	16,416,5	98,7	17,016,9	16,425,8	96.5

Source: Authoring, based on *Analiticheskaya zapiska o khode ispolneniya federal'nogo byudzheta i byudzhetrov gosudarstvennykh vnebyudzhethnykh fondov Rossiiskoi Federatsii za yanvar'-dekabr' 2017 goda* [Analytical Note on the Progress of the Federal Budget and the Budgets of State Extra-Budgetary Funds of the Russian Federation for January–December 2017]. (In Russ.)

Figure 1
Composition of investment in the Russian Federation



Source: Authoring, based on *Investitsii v nefinansovye aktivy: Federal'naya sluzhba gosudarstvennoi statistiki* [Investments in Non-Financial Assets: Federal State Statistics Service]. URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/investment/nonfinancial/ (In Russ.)

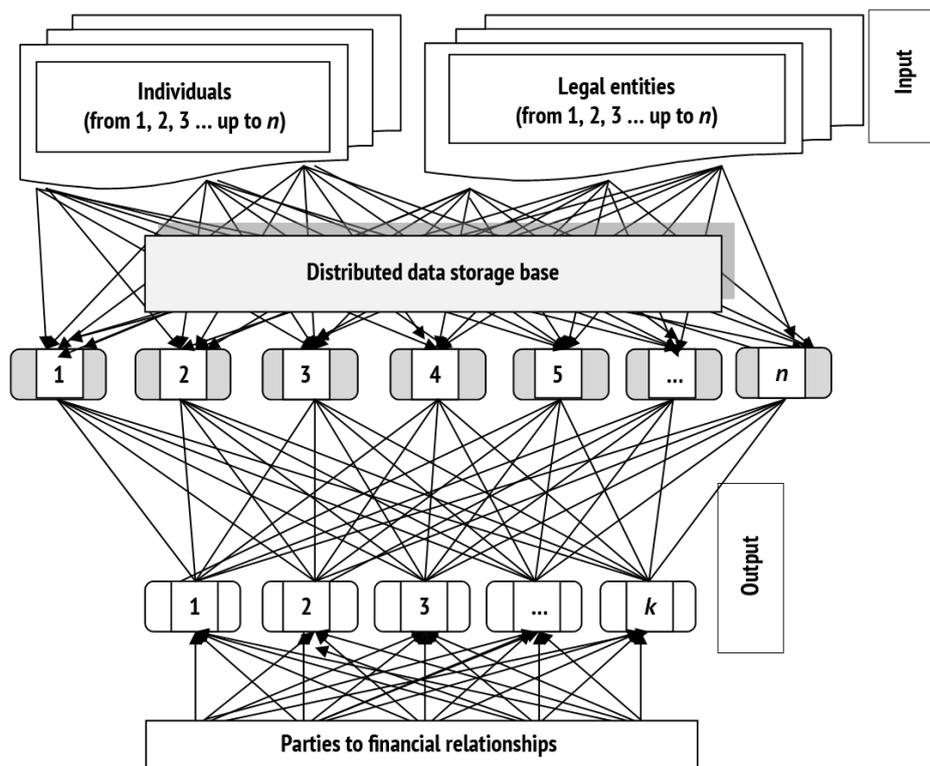
Figure 2

An action plan to create and develop the financial infrastructure

Residents of the financial market ecosystems			Digital financial infrastructure	Key functions
Banks	Ecosystem	Open API	Financial marketplace Financial transaction registration platform	<ul style="list-style-type: none"> - supply of financial services and products to individual-supply of financial services and products to individuals and legal entities; - registration of financial deals; - online money transfers among individuals/legal entities; - access from smartphones, instant messenger, QR code, etc.; - extended list of payment services for banks; - new liquidity management tools; - issue of MIR cards, integration of the EEU payment systems; - innovative service combining the payment system and social/transport apps; - financial messaging;-integration with international systems and EEU systems; - uniform platform for personal identification and authentication for financial and non-financial services, including the use of biometric personal data; -data exchange technology with comprehensive ID of a customer; - IT services delivered by external providers to market actors; -creation of financial services for market actors through the Masterchain technology and legal entities; - registration of financial deals; - online money transfers among individuals/legal entities; - access from smartphones, instant messenger, QR code, etc.; - extended list of payment services for banks; - new liquidity management tools; - issue of MIR cards, integration of the EEU payment systems; - innovative service combining the payment system and social/transport apps; - financial messaging;-integration with international systems and EEU systems; - uniform platform for personal identification and authentication for financial and non-financial services, including the use of biometric personal data; -data exchange technology with comprehensive ID of a customer; - IT services delivered by external providers to market actors; -creation of financial services for market actors through the Masterchain technology
Non-financial entities		Open API	Express payment platform High-potential payment system	
Fintechs	Ecosystem	Open API	National system of payment cards Financial messaging system	
		Open API	Uniform identification and authentication system Comprehensive customer identifier	
Legal entities	Ecosystem	Open API	Cloud service platform	
Individuals		Open API		

Source: Authoring, based on *Osnovnye napravleniya razvitiya finansovykh tekhnologii na period 2018–2020 godov*

[The Main Directions of Development of Financial Technologies for the Period 2018–2020]. Moscow, Central Bank of the Russian Federation Publ., 2018, pp. 12–14

Figure 3**The scheme of the embedded neural blockchain platform for financial control from all parties to financial systems**

Source: Authoring

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Conflict-of-interest notification

We, the authors of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.