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FINANCIAL PROJECTION OF SECTORAL INTERACTION OF RUSSIAN
ECONOMIC ENTITIES IN THE CONDITIONS OF REINDUSTRIALIZATION

Specialization 08.00.10 - Finance, money circulation and credit

REPORT
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I. GENERAL CHARACTERISTICS

Actuality of the work. Community development, the dynamic capacity of its economic potential are impossible without the development of the industrial profile of the economy. This requires the development of effective mechanisms for financial support of the real economy. The search for new forms and mechanisms of financial support of re-industrialization in the domestic economy - is one of the fundamental problems of Russian economic science. Effective interaction of the real and financial sectors of the economy is a prerequisite to long-term resources of the real sector of the economy.

However, in the domestic economy sectoral interaction is not always effective. There are difficulties with the formation of long-term financial businesses relations. This gives greater importance to activities aimed at stimulating this process. Special attention is required processes which limit the possibilities of financing the development of new processes in the industry and its priority areas: lack of investment credits; availability of investment pause in the life cycle of business entities; high volume of borrowed funds of economic entities; increasing the pressure on the capital reduction of its quality; inefficient ratio of debt to equity; disagreement of interests of financial and real sectors of the economy.

The traditional system of interaction between the real and financial sectors shows inefficient results. This is confirmed by the weak dynamics of the gross domestic product (less than 3%), different levels of profitability of the sectors (30% in the financial and less than 15% - in the real sector of the economy), the weak trends in capital renewal in not raw sectors of the economy.

Given the growth of innovative processes, providing reindustrialization, there is a need of theoretical and practical study of systems of interaction of real and financial sectors of the economy. In the context of re-industrialization in Russia it is important to the balance of innovative and traditional economic processes, taking into account the sectoral interactions and cycles of economic conditions.

The banking sector is an important element of economic development and a source of long-term financing. It may be a key factor in accelerating and containment of economic growth. The special position of the banking sector, the conditions for its operation and control system does not meet the needs of the real economy. This creates an imbalance and instability of the rates and proportions of economic growth business entities.

The share of loans of commercial banks in the structure of investment in fixed assets is less than 10% (Fig. 1). This type of financing is used by business entities mainly for working capital. According to statistics¹, the financing of investment activities is 2-3% of the total received loans.

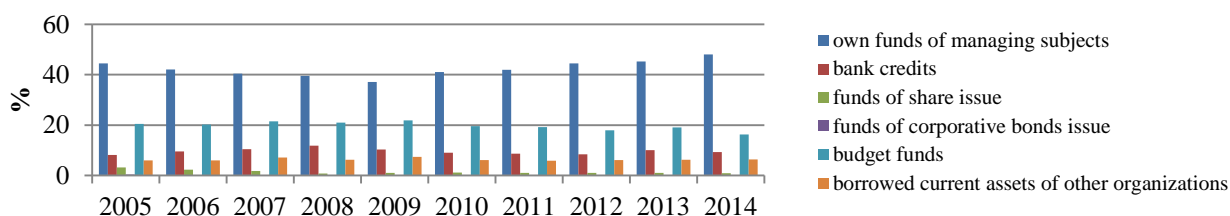


Figure. 1. Investments in fixed capital by sources of financing, in% by year

There are influence factors on sectoral interaction: geo-innovation - strengthening the role of the regional economy, which brings together regional institutions of the banking sector, the financial sector and the real economy; disintermediation - the growth of the

¹ Federal State Statistics Service of the Russian Federation: www.gks.ru

volume of transactions in the securities market, increasing the role of collective savings in the redistribution of financial resources; securitization - the integration of market participants, transformation of assets of business entities in the market-based instruments; reindustrialization - the recovery of role and the place of industry in the economy as its basic components.

The strategy of innovative development of the Russian Federation for the period until 2020 has two main phases of implementation: 1) Increase the susceptibility of Business and Economics to innovation (2011-2013.) 2) Increase of private funding of research and development, increase funding for education, science and innovative economy infrastructure (2014-2020).

The objectives of the second phase are: the implementation of major projects in priority areas of science, technology and engineering; rearmament in the industry; the formation of a functioning national innovation system, etc. In the conditions of reindustrialization as the leading sectors of economy the innovative sector, the industry and production infrastructure are designated.

Questions of the solution of problems of formation of mechanisms of interaction of real and financial sectors for formation of reindustrialization of the Russian economy have complex and multilateral character. They should therefore be examined on the basis of theoretical and methodological principles of financial engineering as an effective instrument of analysis and assessment of sectoral cooperation.

Problems of formation of mechanisms of interaction between the real and financial sectors in order to re-industrialization of the Russian economy should be examined on the basis of theoretical and methodological principles of financial engineering as an effective instrument of analysis and assessment of sectoral cooperation.

The complexity of the identified problem and its high importance to improve the efficiency of economic entities of the Russian Federation determined the relevance and importance of the theme of the research

Degree of a theme work. The impact of the financial and banking sector in the economy and their special role in the task of ensuring sustainable economic growth led to a scientific interest in the problems of designing effective forms of interaction between the banking and real sectors of the economy in the conditions of re-industrialization.

Etymological bases of research of sectoral cooperation laid in the works M. Binsvanger, B. Braash, N.S. Voronova, A. Galetovik, M. Geyne, X. Gesse, R. Gilferding, Dzh. Gurli, R. Gutman, Dzh.M. Keyns, K. Marks, X. Minski, Dzh. Oliver, X. Titmeyer, Dzh. Tobin, Dzh. Stiglic, S. Strendzh, K. Cinn, E. Shou, Y. Shumpeter, V. Chik, B. Emunds and others.

Financial projections sectoral cooperation devoted to the works of foreign and domestic scientists: P.H. Beumnot, T.S. Berder, K.M. Marshall, YU.I. Kapelinski, M. Kiepert, P. Kudre, Dzh. F. Marshall, F. Ndupuchi, D. Ruppert, M. Tabet, D. Timoshin, Dzh. Finnerti and others.

Investigation of the role of the banking sector in the update sources of capital devoted to the works of scientists: M.P.Abdurahmanov, M.A. Abramov, G.L.Avagyan, D.V. Voronin, E.E. Veselkova, R.G. Gospodarchuk, I.R. Gotovchikov, A.N. Edelikina, S.M. Iliyassov, E.V. Kasiyan, YU.I. Korobov, O.I. Lavrushin, V.V. Maslennikov, P.M. Mozias, L.N. Molchanova, I.K. Olehov, S.N. Orlov, A.M. Polyancev, A.M. Rahmetova, A.H. Sarkisyanc, O.G. Semenyuta, B.I. Sokolov, YU.A. Sokolov, N.V. Suncova, E.P. Ternovska, G.A. Tosunyan, S.YU. Hasyanova.

Methodical bases of development of Russian industry presented in the works: A.G. Aganbegyan, A.A. Akimov, P.V. Akinin, V.P. Barilenko, I.D. Demina, I.R. Dun, R.N. Zaripov, N.A. Kazakova, N.A. Kizim, N.I. Kirkorova, L.P. Kroliveckaya, N.V. Kruchinina, O.A. Panova, A.M. Rahmetova, V.V. Semenihi, V.V. Sklyarova, D.R. Shperber and others.

Research of effective forms of sectoral cooperation are presented in the works of scientists: E.F. Avdokushin, E.A. Baklanova, G.N. Beloglazova, I.YU. Belyaeva, V.I. Vagizova, V.E. Evdokimova, V.V. Ivanov, E.A. Isaeva, V.A. Kononenko, I.G. Levina, YU.M. Osipov, N.I. Parusimova, P.YU. Poluhin, A.A. Porohovskoi, M.P. Postalyuk, E.V. Rybin, V.V. Ryazanov, T.R. Safina, O.S. Suharev, M.I. Suhov, M.H. Halilova, M.A. Eskindarov and others.

Interaction of banking and real sectors of the economy researched foreign scientists: R. Kotter, J. F. Sinkey, R. Smit, E. Rid, R. Rouse, U. Sharpe and others.

Contribution to research the theoretical foundations of regional economic development and the formation of regional policies for sustainable economic growth made foreign authors S. Dennison, X. Zibert, A. Lesh and others, as well as domestic economists A.G. Granberg, A.I. Dobrynin, A.B. Melnikov, A.S. Marshalova, A.S. Novoselov, O.A. Osodoeva, YU.K. Perskiy, A.A. Polidi. R.A. Popov, S.G. Tiaglov, R.I. Shniper. The cluster approach to structuring the regional economy and its separate branches is grounded in the works of E.M. Bergman, K. Morgan, A.A. Migranyan, S.I. Parinov, M.E. Porter, G.R. Hasaev, M. Enrayt.

Despite the number of studies on the development of the economy and the banking sector, currently available approaches to financial planning effective forms of interaction between the banking and real sectors of the economy in the re-industrialization of the national economy.

The goal and tasks of the work.

Goal of the work is the financial projections of sectoral cooperation in the conditions of re-industrialization of the Russian economy.

Achieving the goal of research predetermines formulation and solution of the following main tasks:

- to develop author's approach of financial design of sectoral interaction according to cycles of an economic environment;
- to offer classification of instruments of interaction of the bank and real sectors of economy focused on reindustrialization of domestic economy;
- to reveal system contradictions of interaction of bank and real sectors of economy taking into account cycles of an economic environment;
- to develop business models of system of long-term interaction of bank and real sectors of Russia with application of cluster technologies of neural networks of Kokhonen;
- to develop algorithm of financial design of the sectoral interaction focused on overcoming of effects of a szhatost, depth and a relaxation of the financial market.

Object of the work is the set of economic relations arising in the process of interaction between the financial and real sectors of the economy in the conditions of re-industrialization.

Subject of the work is the mechanism of financial design of effective forms of interaction of bank and real sectors of economy allowing forming the long-term resource market, focused on reindustrialization of domestic economy.

Theoretical and methodological base of the work served as the scientific works of domestic and foreign scientists in the field of interaction between the banking and real

sectors of the economy; publication in periodicals; materials of international, national, scientific-practical conferences devoted to theoretical and practical aspects of financial projections forms of interaction between the banking and real sectors of the economy.

Problem solving has been realized with the use of scientific (dialectics, analysis and synthesis, induction and deduction, scientific abstraction, hypotheses, systems, evolutionary) and special (economic and mathematical modeling, tabular and graphic representation, mathematical statistics, Kohonen neural networks) methods. Main provisions and conclusions of the thesis can be applied by business entities of the real sector, financial and credit institutions of Russia and the Volga Region in the development and implementation of activities aimed at the development of industrial policy; Ministry of Economic Development of the Russian Federation, the Ministry of Finance, Ministry of Industry and Trade of the Russian Federation the formation of effective forms of cooperation between the banking and real sectors of the economy, the development of measures for financial support of the real economy.

Main provisions and conclusions of the thesis can be applied in the educational process in teaching courses on "Economics."

Information base of the work.

The information base for research were: publications in refereed journals, government documents and materials of the Russian Federation, expert surveys of managers and experts of economic entities, analysis of their experience, statistical data of the official websites of the Internet, reviews of abstracts.

Create a database on indicators of banks' activities over the time period 2008-2013 year (based on the official statistics the Bank of Russia). In 2013, the study participated 858 banks, in 2012 - 852 banks, in 2011 - 865 banks, in 2010 - 801 banks, in 2009 - 732 banks, in 2008 - 754 banks.

Significant theoretical and practical value of research represent the largest consulting companies PricewaterhouseCoopers, KPMG, Ernst&Young, Deloitte, professional research and consulting agencies and employers' associations.

The contents of the work corresponds to paragraph 3. Finances of economic entities: 3.25. Financial investment and innovation processes, financial investment instruments; 3.5. Management of the finance of managing subjects: methodology, theory; paragraph 10. Banks and other credit institutions: 10.9. The specifics of the Bank's funding of investment activity of enterprises of different industries and legal forms; 10.10. Financial innovation in the banking sector Passports of the Higher Attestation Commission of the Ministry of Education and Science specialty 08.00.10 - Finance, monetary circulation and credit.

Scientific novelty of the work it is to develop theoretical and methodological foundations for the development of interaction between the financial and real sector of economy in the conditions of re-industrialization of the Russian economy, taking into account the economic situation cycles.

Main results of determining the novelty of the scientific work:

1. Developed the author's approach of financial projections sectoral cooperation, in accordance with the cycles of economic conditions; identified factors breakthrough interaction between banking and real sectors of the economy.

2. The classification of instruments of sectoral cooperation in re-industrialization of the national economy. Such instruments include: matrix interaction mechanism, cooperation on the basis of clusters, balanced efficiency mechanism for interaction, sectoral cooperation focused on creating long-term investment and venture cooperation.

3. Revealed systemic contradictions interaction between banking and real sectors of the economy. It is most noticeable during the crisis and lead to a reduction in long-term resources. It focused on the convergence of the life cycle of banking and real sectors of the economy, erases contradictions interaction and develops of long-term resources market for the purposes of re-industrialization.

4. Developed the author's business models of long-term cooperation based on cluster technology Kohonen neural networks. They provide realization the reindustrialization process in Russia and help identify orientation of banks on long-term sectoral cooperation.

5. Developed an algorithm for the financial projections of sectoral cooperation, oriented to overcome the effects of compression, depth and relaxation of the financial market. This will solve the problem of long-term resource support for re-industrialization process. Also proposed model of long-term funding instruments on the example of crowdfunding.

Practical value and realization of the work.

The main provisions of the research presented and approved at the international, university scientific conferences and symposiums. Studies have approbated the development of Russian Humanitarian Foundation grants.

Publications. On the subject the thesis was published 20 scientific works, totaling 23.3 quires (1 monograph, 8 publications in journals included in the list recommended by the Higher Attestation Commission, 3 publications in journals Scopus)

Structure of the manuscript. The PhD thesis manuscript is divided into introduction, three chapters, containing 9 paragraphs, conclusions, references and appendix.

II. REVIEW OF THE PRINCIPAL RESULTS OF THE WORK

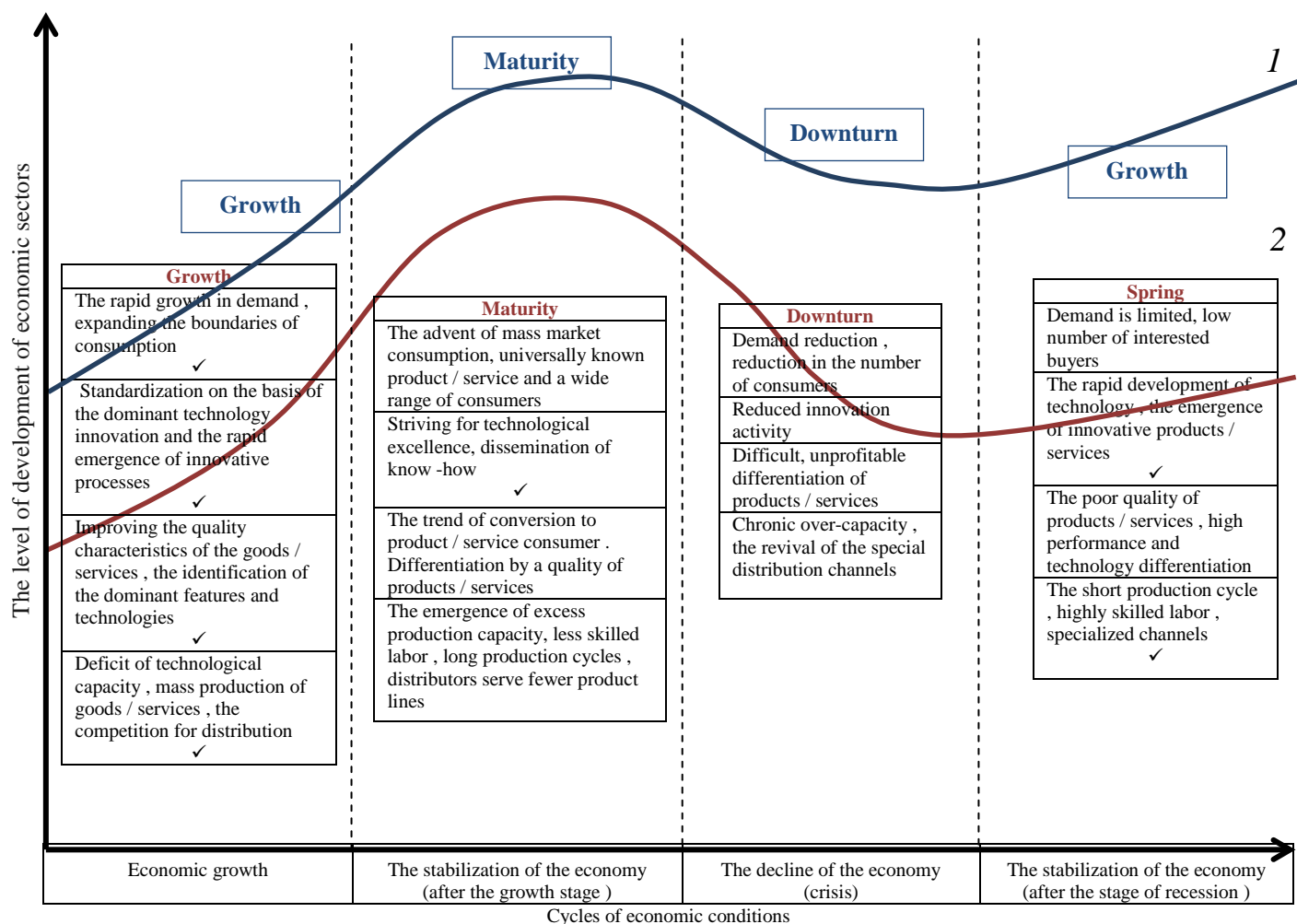
1. Developed the author's approach of financial projections sectoral cooperation, in accordance with the cycles of economic conditions; identified factors breakthrough interaction between banking and real sectors of the economy.

Financial projection sectoral interaction allows to assess the economic and financial attractiveness of the integration process in a reindustrialization; develop a model of breakthrough interaction between banking and real sectors of the economy in accordance with the cycles of economic conditions; develop an algorithm for evaluating the financial and economic condition of the long-term resource market in reindustrialization.

Financial projection - is a modeling of traditional and innovative systems of interaction between the financial and real sectors of the economy in order to re-industrialization. The goal of the financial projection - is to improve the algorithm of integration between the financial and real sectors of the economy in a reindustrialization and limited long-term resource market. Long-term resource market in the thesis - is the resources of the financial market transformed into long-term operation of business entities in order to implement the process of re-industrialization.

The concept of "reindustrialization of economy" is defined as process of traditional and innovative transformations of structures of industrial production of economic system at all its levels, in all branches, sectors and fields of activity of the economic entities focused on providing fixed assets, change of an industrial profile and development of innovative structures.

The main factor for the development of the industry is to achieve consistency and balance with the external and internal environment, the ability to adapt to current market trends. For the effective alignment of sectoral cooperation is necessary to define particular stages of their life cycle, taking into account the need for long-term investments (Fig. 2).



✓ - need of the real sector in long-term resource provision

Figure 2. Synchronization of the life cycle of the financial and real sectors of the economy in a reindustrialization: 1 - bank, 2 - a real sector of economy

When considering the life cycle of business entities of the banking and real sectors of the economy there is a discrepancy in stages. Coincidence of stages during the periods of growth and stability in economic development is noted. In periods of economic downturn the real sector, in contrast to the bank, is experiencing a period of recession and it has a long recovery.

The main difference between the developments of sectors of the economy is the pace at which they go through the stages of the life cycle. The pace of development real sector is several times lower than the pace the bank. At the same time banking sector is growing, regardless of the real. Increasing the rate of the first recorded only a slight increase in the pace of the second.

Research of dependence of phases of life cycle of financial and real sectors of economy in the conditions of reindustrialization from factors of their development is conducted, and also the factors uniting stages of life cycle of sectors of economy are considered and extents of their influence are defined (Fig. 3).

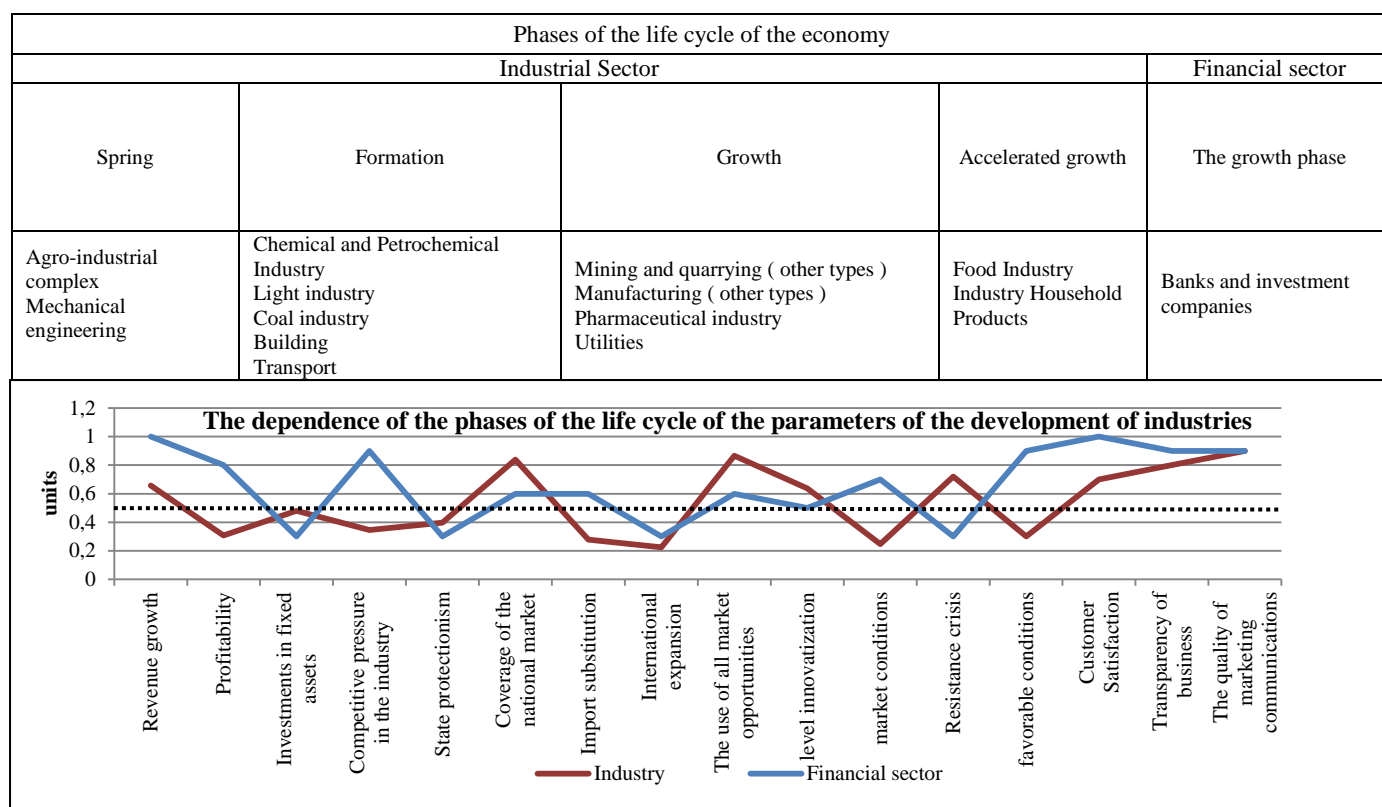


Figure 3. Projecting sectoral cooperation in terms of industrialization, based on the phases of the life cycle of business entities

The model of correlation analysis includes the following indicators of economic entities of the economy: revenue growth rate, investment in fixed assets, profitability, competitive position in the industry, the level of innovation, international expansion, import substitution, the scope of the national market.

The factors include the coordinated interaction (Fig. 3): revenue growth rate, level of innovation, the scope of the national market, the use of all market opportunities. The improvement of these factors leads to a fading of contradictions and the growth rate of the industry's transition to the next stage of their life cycle.

Factors illustrating their disagreement are: innovatization industry level, profitability, competitive pressure in the industry, import substitution, market conditions and resistance to the crisis.

In order to identify factors breakthrough interaction assessed level of interdependence of the above factors. Factors potentially breakthrough cooperation may include: investment in fixed assets, revenue growth rate, the level of innovatization industry, coverage of the national market, resistance to the crisis.

The efficiency evaluation of a monetary policy of Bank of Russia using the cluster analysis is carried out. The database from 2007 to 2015, consisting of the following parameters is for this purpose constructed: the credits to real sector by terms, the credits to real sector by industries, transactions direct repo, overnight credits, collateral loans, intraday credit, subordinated credits, other credits, refinancing rate, Bank rate, required reserve ratios, SWAP operations.

Statistics is taken from the official website of Bank of Russia.

Degrees of correlation defined instruments of monetary policy and lending to the real sector of the economy in the context of the timing. The correlation analysis showed,

that influence on the resource market of the real sector oriented to reindustrialization render the following instruments: subordinated credits, transactions direct repo, intraday and other credits (correlation coefficients more than 0,6).

All other instruments don't make essential impact. Intra overnight credits of Bank of Russia is the short-term resource, but is used by the credit organizations for long-term financing.

Industries of real production sector of Russia which are financed by the chosen factors are determined (table 1).

Table 1

Correlation analysis based instruments of monetary policy and lending to the real sector of the economy by industries

Parameters	REPO	Intraday credits	Other credits	Subordinated credits
Whole	0,5977	0,6884	0,4587	0,3243
Mining operations	0,6282	0,7672	0,6362	0,3014
Manufacturing activity	0,5681	0,6578	0,5380	0,4507
Production and distribution of electricity , gas and water	0,4706	0,5594	0,3442	0,2603
Agriculture, hunting and forestry	0,3927	0,4894	0,2050	0,1276
Building	0,6422	0,7036	0,3922	0,3408
Transport and communications	0,5091	0,5970	0,3139	0,0201
Wholesale and retail trade; repair of motor vehicles , motorcycles, household goods and personal items	0,6853	0,7406	0,5423	0,4875
Real estate operations , rent and services	0,6043	0,6976	0,4280	0,2638
Other activities	0,3069	0,4617	0,2387	-0,0236

Funds transferred to the banks by means of these instruments generally directed to the construction, wholesale and retail trade and mining. Other industries of real economy are less dependent on these instruments.

Funds from repo transactions and intraday credit are also distributed in such industries, as manufacturing and real estate transactions. However, the degree of influence is much lower. Agricultural industry least depends on the researched parameters.

Thus, the most effective tools of monetary policy the Bank of Russia are determined. Have impact on financing of real sector direct repo operations, intraday and other credits. Other instruments have less impact of influence on the money supply in the economy, or don't render it at all.

The construction, wholesale and retail trade and mining are most financed by the researched instruments. Agriculture is the industry which doesn't have dependence on one of the researched instruments.

Results confirm problems of development of the real sector of the Russian economy are insufficiency of long-term funding. Indicate sources of this problem is a low level of instruments of a monetary policy on interaction in line "Central Bank / real economy", "bank / real economy".

2. The classification of instruments of sectoral cooperation in re-industrialization of the national economy. Such instruments include: matrix interaction mechanism, cooperation on the basis of clusters, balanced efficiency mechanism for interaction, sectoral cooperation focused on creating long-term investment and venture cooperation.

Efficiency of mechanisms of interaction of financial and real sectors of economy is considered (table 2).

Table 2

Instruments of the interaction bank and real sector of the economy, possible to using in Russian Federation

Name	Contents
Matrix interaction mechanism taking into account the life cycle stages	Based on the use of matrix technology researched the relationship between the elements of cooperation, taking into account life cycle stages
Interaction on cluster base	Founded on interaction element financial and real sector of the economy through collection of the uniform organizing formation – an clusters
Interaction mechanism on the basis of public-private partnership	Founded on interaction state and business in purpose long-term investment, oriented on development sectoral interactions in reindustrialization condition and change the industrial profile of the country.
Interaction oriented on creation long-term resource market on base collective investment	Founded on attraction finance households and other institutional investor for expansion long-term resource market.
Venture interaction	Founded on expansion of the borders of the interaction and using in process of the interaction of the models venture financing the economy.

According to the analysis, we can conclude that the most effective is the interaction mechanism on the basis of public-private partnership (the maximum assessment is equal 0,3 points from 1 possible point). The second most importance is the interaction mechanism on the basis of clusters (fig. 4).

Interaction in the conditions of reindustrialization, based on clusters is most in detail considered, as within cluster initiatives there is a possibility of use of the main studied instruments of interaction.

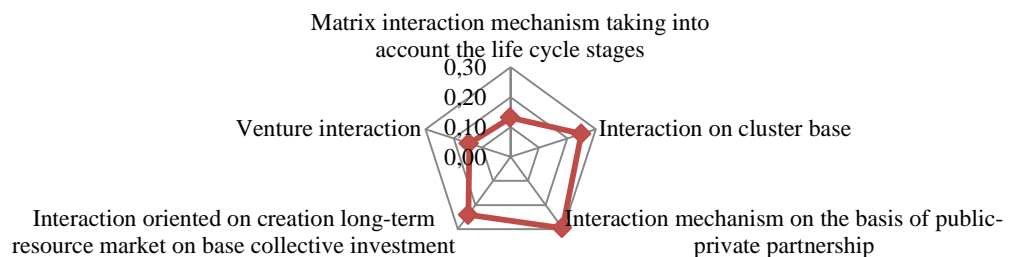


Figure 4. Expert evaluation of efficiency of mechanisms of sectoral interaction

The possible effect of a separate industry from creation of a cross-border cluster is considered. As an example, we analyzed construction and agricultural industries of the Republic of Tatarstan (method of the correlation and regression analysis). As factors the following indicators are chosen: GRP of Tatarstan; share of agricultural industry and construction in GRP of the Republic of Tatarstan. The first makes it possible to determine influence of a cluster on development of all industries of regional economy. The second shows the dependence of these industries on the implementation of cluster initiatives.

To estimate effect of investments and creation of a cluster the following factors will allow: volume of loans - identifies influence of investments of the banking sector on economic entities of Tatarstan; average interest rates on the loans - reveal the dependence

of the development of the real sector on availability of the credits of the banking sector; investments into fixed capital - demonstrate the interdependence of the total investment into industries of real sector and the pace of their development.

Calculations based on official statistical base of the Republic of Tatarstan and Central Bank of the Russian Federation from 2010 to 2015. From the correlation matrix the high level of dependence of the researched parameters of selected factors is visible (table 3).

Table 3

Matrix to correlations for payment of efficiency of the introducing the cluster initiatives in reindustrialization purpose

Parameters	GRP		
	Tatarstan	Agriculture	Building
Volume of loans in total	0,89912	0,49850	0,86842
Volume of loans in agriculture	-0,83415	-0,38849	-0,80523
Volume of loans in building	0,80549	0,33203	0,76532
Average interest rates	-0,74489	-0,85503	-0,78054
Total investments	0,97145	0,65566	0,95336
Investments in agriculture	-0,72740	-0,52333	-0,70685
Investments in building	0,46687	0,84150	0,52454

Changing the volume of bank credits the Republic of Tatarstan has a positive influence on changing the region's GRP. That is, with the increase in lending economic entities have opportunity to produce goods in larger quantities.

In construction industry a strong correlation, unlike agriculture, where correlation between factors the weak. Agriculture is less dependent on bank lending, as mainly uses public investment and private sector investment. In this regard, the volumes of the credits in agriculture are negatively correlated with the change of the GRP.

Average interest rates on loans have the same strong negative influence on the GRP of all economic entities in the region. Level of interest rates is largely associated with the production of GRP: with the increase in interest rates GRP decreases and vice versa.

Investments into assets under management sectors in the conditions of reindustrialization have positive very strong communication with GRP of the region and the share of the construction industry in the region's GRP in particular. From agriculture shares in VPR of the region the inverse average correlation relationship is noted.

Thus, to assess the possible influence of cross-border cluster in the economic sector in terms of re-industrialization and forecasting of this influence the regression analysis industries is carried out. The analysis showed the importance of constructed models.

As a general result of carrying out correlation and regression analysis the multiple equations of regression:

$$Y=197849,7+2,549*X1-10277,8*X2-2,608*X3, \quad (1)$$

where Y - a share of the agriculture in GRP Republics Tartarstan;

X1 - a volume credit banks Tartarstan in agriculture;

X2 - an average percent rate on credit in Republic Tartarstan;

X3 - a volume investment in agriculture of the Republic Tartarstan.

$$Y=43873,36+2,664*X1-4089,9*X2+4,789*X3, \quad (2)$$

where Y - a share construction in GRP Republics Tartarstan;

X1 - a volume credit banks Tartarstan in building branch;

X2 - an average percent rate on credit in Republic Tartarstan;

X3 - a volume investment in building branch of the Republic Tartarstan.

With the obtained regression equations compiled forecasts of the key indicators of interaction between financial institutions and the real economy in a reindustrialization of Tatarstan for 2016-2017 according to two scenarios are made (Fig. 5).

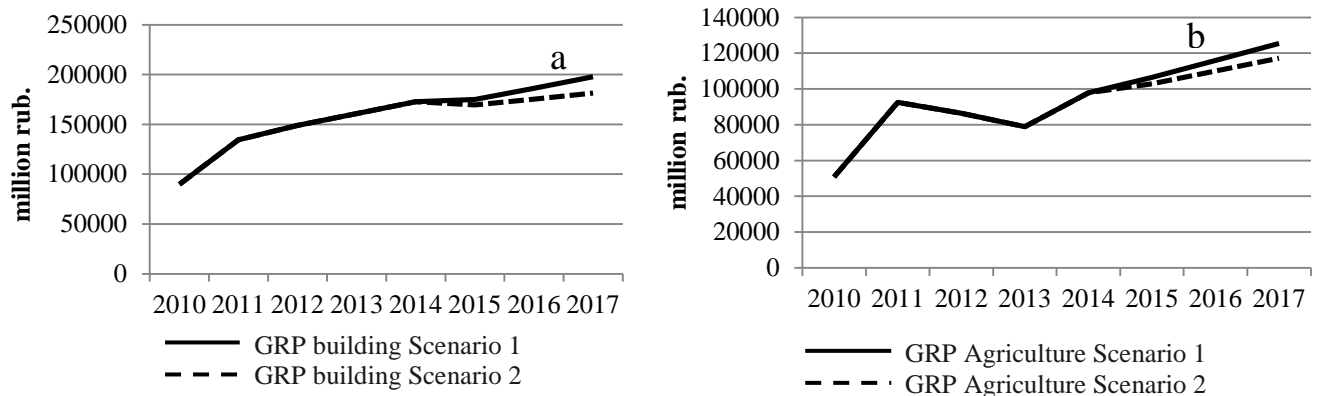


Figure. 5. Scenario analysis of effect of introduction of cross-border clusters in the construction of (a) and agriculture (b) of the Republic of Tatarstan

In their basis the following conditions are laid: Scenario 1 - formation of cross-border cluster, development of sectoral interaction of the Republic of Tatarstan with border territories; Scenario 2 - preservation of current structure of the industry and the system of sectoral interaction in the Republic of Tatarstan.

Scenario 1: against improvement of an economic situation there will be a decrease in level of average interest rates for crediting of economic entities. Their more considerable decrease will entail an involvement of the credit organizations into development of a cross-border cluster in the conditions of reindustrialization and direct involvement in the creation of its final product. The volume of the credits will increase, the volume of investment will also rise. It will allow to accelerate formation of cluster initiatives, modernization of production and introduction of innovations.

Scenario 2: assumes the positive forecast for decrease in interest rates for the credits of economic entities, but they will remain at the high level, volumes of crediting will grow slowly as well as investments.

Thus, the cluster model of sectoral interaction which allows to synchronize development of sectors of economy is offered and to eliminate the revealed contradictions. The model of implementation of cluster initiatives in the Republic of Tatarstan is constructed. The model allowed to identify and prove a positive effect from creation of cross-border clusters, and also to determine their points of growth.

3. Revealed systemic contradictions interaction between banking and real sectors of the economy. It is most noticeable during the crisis and lead to a reduction in long-term resources. It focused on the convergence of the life cycle of banking and real sectors of the economy, erases contradictions interaction and develops of long-term resources market for the purposes of re-industrialization.

In the work following contradictions of modern interaction between banking and real sectors of the economy in the conditions of re-industrialization are allocated:

- contradiction in the level of profitability of sectors (profitability of financial sector several times exceeds profitability of real economy);
- contradiction in the level of riskiness of sectors of economy (orientation of financial sector to moderate risk level; activity of real economy is generally associated with high risk level of insolvency of the project);

- contradiction in time of formation of the investment income (orientation of the financial sector to short-term financing at need of real economy for investments);
- contradiction in resilience level to the crisis phenomena (in the period of economic instability the real sector of economy most is in great need in long-term resources; the financial sector is interested in maintenance of own activity and isn't inclined to investment).

For understanding of influence of the specified contradictions their ranging on the following bases is carried out: significance of impact on economy in 2015; probability of permission of a contradiction in the long term.

Essential contradictions of interaction between banking and real sector of economy in 2015: a contradiction in the level of profitability of sectors of economy (a significance value of 30 out of 100%), a contradiction in time of formation of the investment income (a significance value of 25 out of 100%) and a contradiction in the level of riskiness of sectors of economy (a significance value of 25 out of 100%). The significance of contradictions in resilience level to the crisis phenomena makes 20%.

In 2016 it is expedient to carry out activities aimed on resolution of the following contradictions (Fig. 6, b): contradiction in resilience level to the crisis phenomena (probability of resolution of 35% from 100%); contradiction in the level of riskiness of sectors of economy (probability of resolution of 25% from 100%). In realization the contradictions connected with time of formation of the investment income and level of profitability of sectors of economy are the most difficult.

One of the most difficult aspects of regulation of long-term financial flows is disinterest of the banking sector in financing of real sector during the periods of economic instability. The solution of the problem is creation of cross-border clusters. However at stages of economic recession application of an additional leverage capable to coordinate activity of bank and real sectors of economy is necessary.

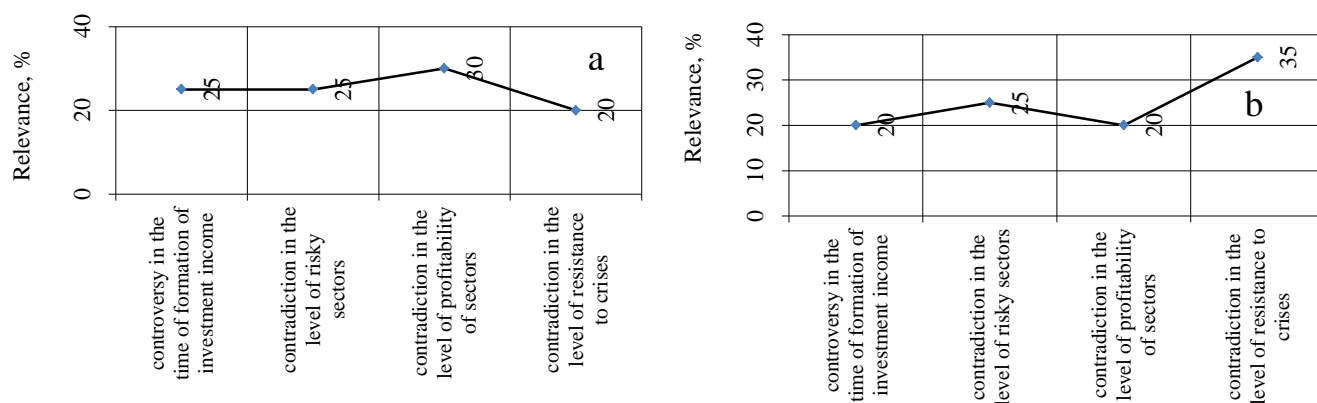


Figure 6. Results of ranking of value contradiction interactions of financial and real sector on probability of their permission in economy: a – in 2014, b - in 2015-2017.

For the purpose of ensuring greater interest of financial structures additional instruments of support of development of clusters are created: subsidies, loans and grants for creation of innovative products and technologies; tax relief for companies and other structures participating in a cluster; legislative protection of intellectual property and copyright.

Besides the specified measures, in our opinion, creation of the mechanism which is in a directive way closer together banking and real sector is necessary. The countercyclical factor of impact on investment activity of banks for reindustrialization can become such mechanism.

Countercyclical factor is the instrument of regulation of sectoral interaction in cross-border clusters obliging the credit organizations to aim certain financial streams at the development of real sector for reindustrialization. This tool will allow providing clusters with necessary long-term and short-term funds during economic recessions.

Bank structures don't show an initiative for maintenance of real sector, regardless of the government's decisions and the developed programs in connection with the increased risks of lending today. Therefore, to the banking sector instruments of motivation to long-term investment can be used at a stage of formation of clusters and development of industries in the conditions of reindustrialization. In the market economy it has to be not the order monetary resources of bank, and projection of conditions under which the banking sector invests in the industry.

Countercyclical factor is a factor changing depending on the following conditions: condition of an economic environment; degree of development of a key industry of a cluster; degree of development of ancillary industries of a cluster; risk level of investments in a cluster of funds at a particular phase of its development; financial condition of the credit organization.

By means of coefficient the share of resources of bank which has to be aimed at the development of a cluster will be defined. Taking into account business models of sectoral interaction the coefficient should be calculated from resources of that urgency which goes to a cluster: the long-term countercyclical factor is estimated from the volume of long-term resources of bank and so on.

Calculating formula of a countercyclical factor of influence looks as follows:

$$V_{fin\ cl} = V_{tr} * KCF, \quad (3)$$

where $V_{fin\ cl}$ - a volume of the cluster financing;

V_{tr} - a volume resource to concrete urgency of the bank;

KCF - countercyclical factor of the development.

The countercyclical factor represents the following function:

$$KCF = \int (E; OB; OD; R; F), \quad (4)$$

where E - an estimation of the long-term economic situation of the country;

OB - a level of development base cluster branch;

OD - a level of development auxiliary cluster branches;

R - a level of the risk of the embedding in cluster financial resource on concrete stage of its development;

F - a financial condition to credit organization.

The coefficient is regulated by Committee of management of a cluster together with the Central bank. Basic data for determination of coefficient is the assessment of an investment situation of the country. Introduction of the similar instrument will allow influencing through Committees of management of a cluster the volume of finance which come to clusters. Will allow to operate clusters during the different periods of economic development, without breaking the principles of market economy and free competition.

Introduction of programs of decrease in tax burden on resources of clusters is also necessary for stimulation of bank structures. Large financial investments at this stage are necessary for introduction of modern technological base, creation of innovative materials, machineries, the equipment and mechanisms, development of all sectors of a cluster, including the basic.

In process of formation and development of a cluster (growth phase) the need for credit resources will decrease. Profitability of industries of a cluster will increase and there will be own means of a cluster. During this period the countercyclical factor has to decrease

(up to zero value) for creation of a competitive basis at entry of banks into financial structure of a cluster. Activity of a cluster becomes more attractive to investors. It creates possibilities of attraction of finance by means of auctions, i.e. on conditions, more favorable to industries. In case of change of market condition and an economic situation the increase in a countercyclical factor for timely attraction of finance during the periods of the increased risks is supposed.

Thus, in life cycle of real and bank sectors of economy parallel development and deleting of contradictions will be observed.

4. Developed the author's business models of long-term cooperation based on cluster technology Kohonen neural networks. They provide realization the reindustrialization process in Russia and help identify orientation of banks on long-term sectoral cooperation.

Studying of business strategies of credit organizations in Russia on the basis of the cluster analysis is carried out. Actual problem of modern theory and practice is identification of groups of banks with different business models and potential opportunities of long-term crediting of real sector of economy in terms reindustrialization.

Carrying out the cluster analysis is caused by need: 1) identifications of the reasons of asymmetry, one of which, in our opinion, the institutional distortion in the most banking system can be; 2) development of tools of effective management of monetary resources for the purpose of ensuring interaction of bank and real sectors of economy. Effective interaction in work is understood as possibility of long-term financing of real sector of economy with preservation of profitability of the banking sector.

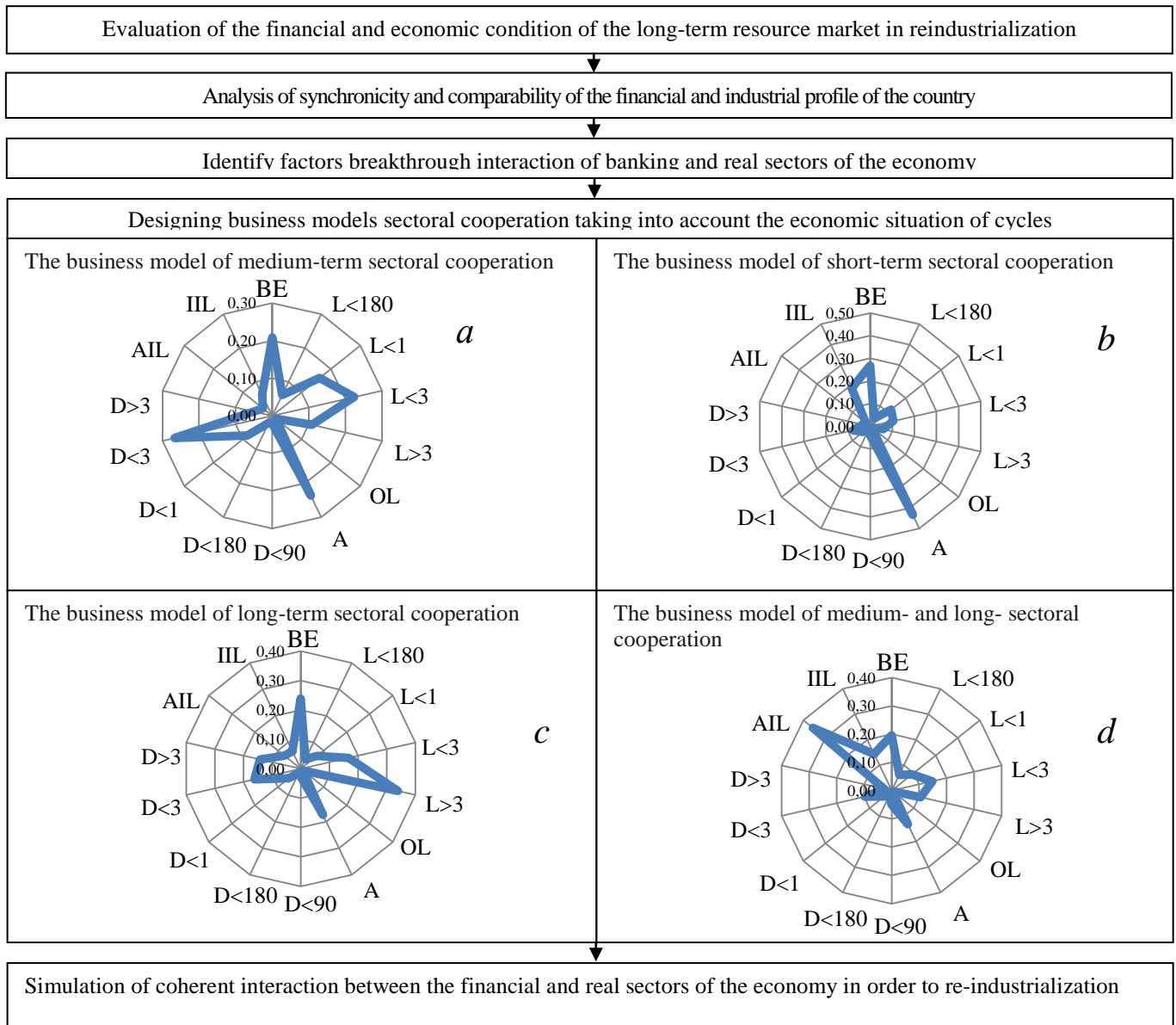
For research of interaction of bank and real sectors of economy of Russia in the conditions of reindustrialization the time period from 2008 to 2013 is considered. As statistical base official data of the Russian Central bank are taken. For information processing the StatSoft 8.0 software product is used. The key parameters which are the most fully describing interaction of bank and real sectors of economy, in our opinion, are the following: level of bank equity (); the volume of loans in a section of terms: overdraft loans (OL), loans up to 180 days ($L < 180$), loans up to year ($L < 1$), loans up to 3 years ($L < 3$), loans more than 3 years ($L > 3$); the volume of the raised funds in a section of terms: accounts (A), deposits up to 90 days ($D < 90$), deposits up to 180 days ($D < 180$), deposits up to year ($D < 1$), deposits up to 3 years ($D < 3$), deposits more than 3 years ($D > 3$); the volume of the attracted interbank loans (AIL); the volume of the issued interbank loans (IIL).

The clustering by method of the neural self-organizing Kohonen's networks is applied to identification of business models of interaction of bank and real sectors of economy of Russia (Fig. 7).

58 credit organizations participated in research for the beginning of 2013, for the beginning of 2012 are 852 credit organizations, for the beginning of 2011 are 865 credit organizations, for the beginning of 2010 are 801 credit organizations, for the beginning of 2009 are 732 credit organizations, for the beginning of 2008 are 754 credit organizations.

The maximum quantity of clusters in every year made about 120 classes. This quantity is received by detection of such number of groups in which there would be no zero clusters. Despite a universalization of bank activity, the clustering showed identity and high extent of influence of each group of banks on the market money movement. By consideration of business models of every year we revealed 23 types of the business models repeating from year to year. The found 23 types of models were united in the expert way in four types of business models. Each type contains the types of business models similar on the main channels of interaction of bank and real sectors of economy. Thus,

despite universality of banks only four types of business models of the credit organizations of Russia are defined.



Ris.7. Algorithm of projecting of business-models of the interaction bank and real sector of the economy in the conditions of reindustrialization: a - the first type, b - the second type, c - the third type, d - the fourth type business-models

Banks of the first type of a business model (Fig. 7) prefer to work at a medium-term basis, to conduct moderate policy. The main sources of attraction of financial resources are medium-term deposits and customer accounts which are distributed in the medium-term credits at rather high level of equity.

The first type of a business model is the most numerous; the maximum level in 566 banks is reached in 2011. The number of type averages 480 credit organizations and remains within six years. Respectively overwhelming number of banks of Russia own instruments of medium-term financing and support the low level of interaction with real sector of economy. In our opinion, exactly in this type of a business model there is a high potential of development of long-term types of interaction.

Characteristic feature of the second type of a business model is the short-term basis of activity, conservative policy and active participation in the market of interbank loans as the creditor (Fig. 7). Attraction of financial resources of banks of the second type happens generally at the expense of short-term deposits, customer accounts, and investment of funds in the interbank loans. Short-term investment of funds means low riskiness of operation; short-term attraction means the low cost of resources. This type of banks prefers to conduct low-risk activity with the smallest expenses.

This type is characterized by the following signs: business is based on short-term resources; conservative policy, low risks; aren't focused on formation of serious investment policy.

The average number of banks in this type makes about 200 banks, except for the period of 2009. Medium-term attraction and investment of resources in this type is presented by insignificant volumes, and investment of funds on customer accounts in the long-term credits is inexpedient as it is interfaced to the increased risks. Reorientation of banks of this type to interaction with real sector is actually impossible without change of strategy.

For the third type of a business model long-term attraction and placement of resources is characteristic. Banks of this type conduct aggressive risk policy concerning liquidity. Similar strategy can negatively influence activity of the credit organizations in the conditions of economic instability. At the same time this type of a business model is most focused on interaction with economic entities of real sector of economy. Taking into account the increased risks of activity banks of the third type support the high level of equity.

This type is characterized by the following signs: an aggressive policy concerning liquidity; active use medium and long-term instruments for long-term investments; orientation to interaction with real sector of economy.

During the period from 2008 to 2011 (without 2009) this type of a business model is presented by the small group on average consisting of 30 banks. In 2009 the business model is annulled, and the maximum value reaches in 2013 (over 100 credit organizations). The volume of long-term financing in this type of a business model is rather high, however is insufficient for providing real sector of economy of Russia with necessary resources.

In the fourth type of a business model banks united with high dependence on the funds raised in the interbank market. Attraction is carried out on medium-term deposits and customer accounts, investment both in medium-term, and in the long-term credits. Strategy of the fourth type of a business model can also negatively affect activity of banks during crisis, and also political instability in the country and the world. At the same time delivery of long-term resources to the population and real sector of economy is observed. In our opinion, it is also possible to call this policy aggressive and risky. This type is characterized by the following signs: use of medium-term tools for long-term investments; main players of the market of interbank lending; orientation to interaction with real sector of economy.

The average number of banks of the fourth type makes about 90 credit organizations, except for 2009 in which the maximum quantity in this type is observed. Interaction with real sector of economy, as well as in a case with a business model of the third type, isn't enough for satisfaction of needs of business for long-term resources.

Thus, on the basis of economic-mathematical research it is established that in the banking sector of the Russian Federation there are four types of business models of sectoral interaction. They differ in the resource potential and level of interaction with real sector of economy. The first and second business models are least effective and focused on average

and short-term sectoral interaction; the third and fourth business models are based on long-term financing, focused on interaction with real sector of economy.

5. Developed an algorithm for the financial projections of sectoral cooperation, oriented to overcome the effects of compression, depth and relaxation of the financial market. This will solve the problem of long-term resource support for re-industrialization process. Also proposed model of long-term funding instruments on the example of crowdfunding.

The algorithm of financial projection of long-term sectoral interaction during the different periods of economic development of the country is developed for research of abilities to integrate financial and real sectors of economy of Russia in the conditions of reindustrialization.

Three properties of the long-term resource market are for this purpose studied: conciseness; depth; relaxation.

The conciseness of the market shows, on the deviation of long-term financing of real sector of economy from the average level on the market depending on an economic environment how many is high.

Level of long-term financing at certain moments of life cycle can be overestimated or underestimated in relation to the optimum. The underestimated level testifies to crediting delay, therefore, and developments of real sector of economy, to lack of possibility of introduction of new technologies, decrease of the activity of industry. Overestimate of level generally has positive impact on real sector of economy, but increases risks of financial sector. For calculation of a conciseness of the market the standard deviation of set $SD \cdot 1,96$ is found. About 95% of data get to this range. It will allow revealing the range of a share of long-term crediting in a balance sheet total of the average representative of the banking sector with probability of 95% (Fig. 8).

The analysis showed, that during the post-crisis period narrowing of the market of long-term resources is observed. That is sectoral interaction after economic shocks is restored for two years.

Depth of the market, in our opinion, is reflected by the minimum and maximum level of long-term interaction of bank and real sectors of economy. Depth of the market shows the borders of long-term interaction within each business model accepted for their functioning.

Depth of the market describes possibilities of expansion of borders of the long-term resource market in the conditions of reindustrialization. 5% of the credit organizations which enter business models are characterized and are their extreme values (emissions). Reflect extreme values of long-term financing which can arise at a certain business model of interaction of bank and real sectors of economy.

High level of depth of the market which decreases during the crisis period is revealed and has the restoration period two years. In general regardless of a cycle of an economic environment there is a possibility of considerable expansion of the resource market (Fig. 8).

The relaxation is the speed about which the level of long-term financing comes back to average value to business models after the crisis phenomena in national economy.

The relaxation of the market is an indicator of response of the market to unforeseen circumstances, for example, the crisis phenomena. When finding speed of a relaxation of the market it is possible to define, on actions of the credit organizations, and in certain cases the government and the Central bank of the state in non-standard conditions how many are effective. The relaxation speed is higher, the is more effective and the policy of

reaction of the banking market and the state in general on non-standard operating conditions is more effective. Speed of a relaxation is defined as a time span between the moment of a deviation of level of long-term financing from the general tendency in a business model and return to it. On average, the relaxation of the market of long-term interaction of bank and real sectors of economy makes from a year to two years.

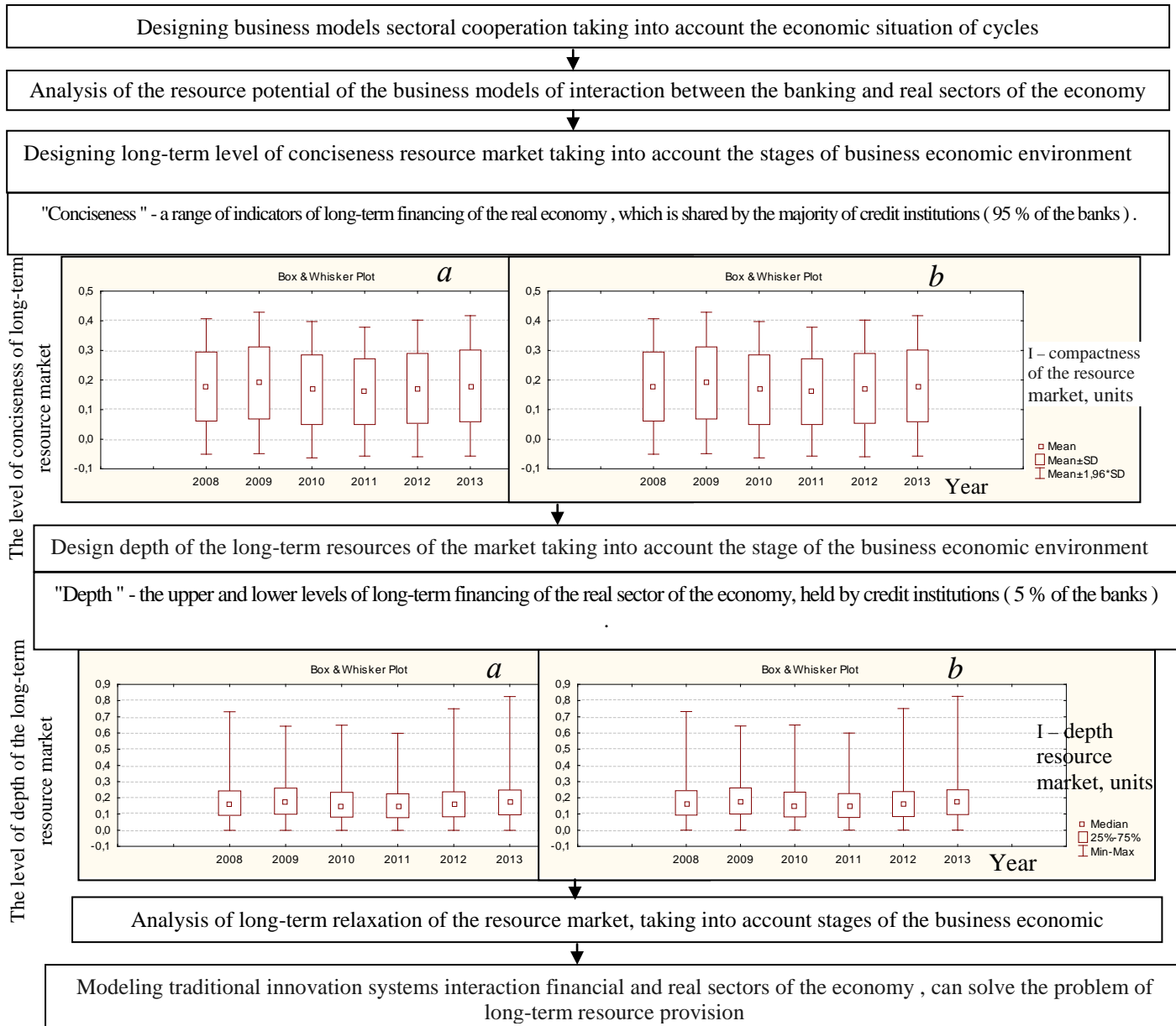


Figure 8. Algorithm of projection of level of a conciseness and depth of the long-term resource market in system of sectoral interaction in the conditions of reindustrialization: a – resources term from a year to 3 years, – resources over 3 years

In the conditions of reindustrialization for development of industrial structures by a source long-term financing institutional investors, own funds of the enterprises, household funds, budget funds, foreign investments can be.

Efficiency of crowdfunding projects is considered. It is revealed that it depends on a number of factors: the volume of the demanded investments, profitability of the project, project duration from the point of view of payback and time of fund raising, a share of own funds of the developer in financing of the project, receipt of resources in the first days of

existence of the project, existence of bonuses and programs of loyalty. We considered the current efficiency of crowdfunding projects of Russia of such categories as science, technologies and business. The above indicators on the existing projects are for this purpose estimated. On the basis of the obtained data the formula of efficiency of crowdfunding business projects in Russia is defined (Fig. 9).

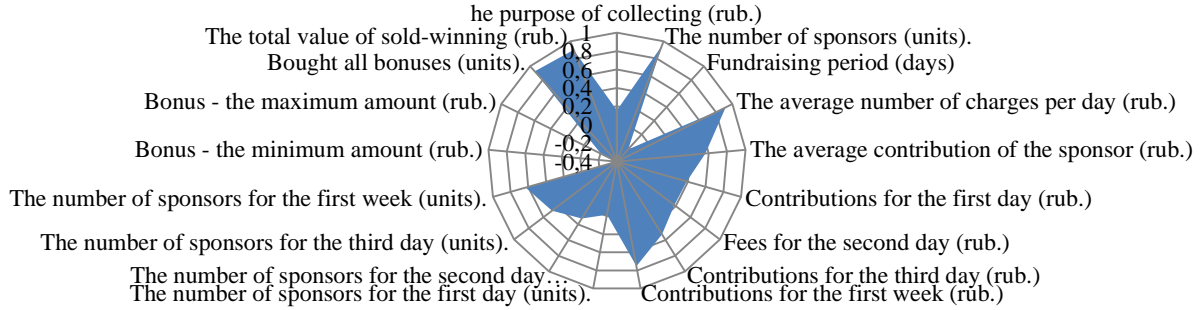


Figure. 9. Assessment of influence of various factors on efficiency of crowdfunding business projects in Russia

As parameters of research are chosen: the necessary sum of money for implementation of the business project (the purpose of collecting); number of sponsors of the business project; fund raising period; average number of collecting in day and an average contribution of one sponsor; the volume of contributions in the first days of existence of the project and in a week; number of sponsors in the first days and in a week; the maximum and minimum price of bonuses for financing of the project; quantity of the bought bonuses and their total cost.

By results of the analysis it is revealed that the following conditions are necessary for effective implementation of the crowdfunding project in Russia: the period of fund raising has to be minimum (about amonth) as at its increase interest of private investors in the project decreases; success of the project is defined in the first week of its existence, therefore the amount of financing attracted these days (eventually the volume of investment is sharply reduced); the total amount of the resources necessary on implementation of the project, isn't the defining factor as the majority of successful projects attract the sums several times exceeding the declared; the number of sponsors is directly connected with the volume of the attracted investments.

Therefore, creating the project based on crowdfunding technologies it is important to draw to it attention by means of mass media and most well to explain its advantages both to society in general, and for the specific investor.

General formulas of efficiency of implementation of the crowdfunding project the following:

$$E_{crowd} = \frac{(F_r / V_i \times K_b + OF)}{t_f} + \frac{IRR_{pr}}{t_{pb}}, \quad (5)$$

Where E_{crowd} - efficiency of crowdfunding project;

F_r - an arrival resource at the first weeks of existence of the project;

V_i - volume required investment for realization of the project;

K_b - factor bonus and programs to loyalty of the project;

OF - volume of the own facilities of the developer of the project;

IRR_{pr} - project profitability;

t_f - duration of the collection of the facilities for project;

t_{pb} - a pay-back period of the project.

The coefficient of bonuses and loyalty programs of the project calculated a ratio of cash flow due to their granting and set of costs of bonuses of the developer of the project.

The formula allows to determine project potential on the first weeks of its existence and probability of collecting the necessary volume of investment for its realization.

Thus, on the basis of indicators of a conciseness, depth and a relaxation of the market of sectoral interaction in the conditions of reindustrialization features of life cycle of long-term interaction during the different periods of development of economy are defined: during the periods of instability of an economic environment there is a narrowing of the long-term resource market more than 60% of the credit organizations of the country; there are possibilities of expansion of borders of long-term financing of real sector of economy at all stages of development of economy that testifies to existence of high volumes of the underused resources of financial sector (internal investments, finance of house farms, foreign investments can become additional sources of financing in the conditions of reindustrialization); the relaxation of the market long also occurs within two years that negatively influences long-term sectoral interaction.

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