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The Role of Credit Financing for Capital Investments Of The Real Economy Enterprises

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Abstract

The transition from vertically distributed financial resources to horizontally distributed ones among market participants led to the shortage of the government support to the real economy enterprises for their investment activities. The shortage of equity also does not promote the modernization of production facilities. At the same time, the development of favorable conditions for stimulation of economic growth is one of priorities for the government. The implementation of such conditions in many respects depends on the involvement of the banking sector into financing of the investments into fixed capital realized by the enterprises of the real sector of economy.
This article also observes interdependence of economic growth and the financing of investments into fixed capital. The research revealed strong correlation between the volume of investment into fixed capital and GDP growth, trends and patterns of financing of investments into fixed capital under current economic circumstance were defined. The structure of sources of the investment financing was analyzed and the respective conclusion on insufficiency of banking credit financing of the investment into fixed capital of the enterprises of the real sector was proven. As result the research provides suggestions on increasing of the banking sector role and its involvement in the investment financing in fixed capital of the non-financial organizations.

Keywords: investments, fixed capital, economic growth, credit sources, financing

JEL Classification Codes C 10, G 28, G 31

Introduction

The purpose of investment processes in economy defines dynamics and patterns of development both for specific territories and the country overall. Stimulation of economic growth and improvement of the quality and the standard of living of the population requires leveraging of the sufficient amount of investment into the real sector of economy. When

additional financial resources are involved in economy, thanks to investments, it creates prerequisites for increased reproduction.

Analysis of recent research and publications

Financing of modernization of the enterprises promotes not only increase in production volume, but also production of hi-tech and competitive products, growth of profitability of the companies and regional development. Nowadays access of the non-financial organizations to the credit financing is limited. Thus, one of the critical problems to be solved is searching for potential sources of financing of investments for the enterprises of the real sector of economy.

The paper (Arsenieva, 2020) believes that fixed capital of the enterprises is a basis of material and technical resources for production. Hence it defines possibilities for the innovation upgrade of all production and economic activities of an enterprise, its production diversification and potential economic growth. At the same time financing of the innovation investment projects promotes the solution of current environmental problems.

In the article (Abbas, 2020), the author considers that formation of fixed capital stimulates economic growth and impacts environmental sustainability. At the same time, it is important to mind that duration of effect of investment programs depends on the volume of capital investments.

The paper (Osinevich, 2019) estimated the size of additional GDP growth achieved by the country due to decrease in a tax burden at the expense of that part of own state consumption in the future which the state is ready to refuse in favor of economic entities investing in innovative projects. The lack of investments makes almost impossible technical renovation of the enterprises as well as creation of new businesses and jobs.

In the article (Parusimova, 2019), according to the authors, in order to solve the problem of modernizing the mechanism of credit relations, it is important to comprehend not only the existing trends, but also those phenomena, which will become predominant in the credit relations of banks with borrowers of the real sector in future. An increase in the role of credit in creating new value can be facilitated by the offer of credit products adequate to the conditions of our time, the improvement of the rules of the game, the implementation of structural reforms and a balanced economic policy.

The article (Abramova, 2018) examines trends in the formation of domestic investment demand in the Russian economy in the context of the regulatory potential of monetary policy. Proposals are made to increase the effects of modern monetary policy in the context of the formation of domestic investment demand. The choice of strategic priorities has been substantiated monetary policy that is adequate to the requirements of sustainable economic growth and is interconnected with other components of macroeconomic policy.

Purpose of the article

The research intends to study financial sources of investments into fixed capital of the enterprises. We aim to analyze duration and qualitative effects of size of investments into fixed capital on the GDP level. The research investigates key features and fundamental trends of financing of entities' fixed capital. Credit funds are defined as preferable and perspective sources of financing for entities of real sector of economy.

Research Methods

Economic and statistical methods were used for complex assessment of the current state of the investment financing in fixed capital. The official data published on the official sites of the Bank of Russia and Federal service of statistics were processed by standard methods of mathematical statistics and interpreted by means of general scientific methods of the economic analysis.

Positive impact of volume of the investments on gain of GDP is confirmed by statistical investigations. GDP as one of key macroeconomic indicator is usually used for assessment of national economy development stage by expert community. GDP (PPP) growth in comparable prices defines rates of economic growth.

We investigated the effect of increase in the volume of investment into fixed capital on GDP growth. We considered the volume of investment into fixed capital as the integrated indicator influencing the GDP level. We processed 2000 – 2019 data on deflated GDP and investments into fixed capital on a country level.

Based on the deflated values of these indicators we created the model with infinite distributed lags. Investments into fixed capital represent exogenous variables I_t, I_{t-1},I_{t-2}, I_{t-3}, I_{t-4}…., and the GDP level $Y_t$is an endogenous one.

The objective of our research is assessment of duration and qualitative effects of size of investments into fixed capital on the GDP level.

$$Y_t = a + b_0 I_t + b_1 I_{t-1} + b_2 I_{t-2} + b_3 I_{t-3} + \ldots\ldots + \varepsilon_t, \quad (1),$$

The explanatory variables taken with delay in time $I_{t-1}, I_{t-2}, I_{t-3}, I_{t-4}$…. are called lagged exogenous variables.

Coefficient b_0 and $\sum_{j=0}^{\infty} b_j$ are short-term and long-term multiples respectfully. It is obvious that influence of invested funds on GDP somewhat weakens over time. Therefore, it is possible to assume that the coefficients of the distributed lag in the equation (1) will decrease exponentially.

$$Y_t = a + b_0 I_t + b_0 \lambda I_{t-1} + b_0 \lambda^2 I_{t-2} + b_0 \lambda^3 I_{t-3} + \ldots\ldots + \varepsilon_t, \quad (2),$$

where $b_j = b_0 \lambda^j; \quad j = 0,1,2\ldots$ (3).

Assessment of parameters of such model is possible if the transformation offered by L.M. Koyck (Koyck transformation) is applied. It is possible to use generalized least-squares method in order to achieve feasible results.

$$Y_t = 2875.8281 + 0.5489 I_t + 0.8253 Y_{t-1} + u_t, \quad (4)$$
$$R^2 = 0.938; \quad \hat{F} = 129.3.$$

The calculated values of the t-statistics for the regression coefficients are, respectively: (4.192), (2.949) and (5.360). It is obvious that prerequisites of a least-squares method for the model are confirmed. Based on the regression model the level of investments into fixed capital provides has significant positive influence on GDP. All parameters of regression are significant with the probability of 95% (t=2.01). The average relative error of model is $\bar{E}_{relative} = 7.3\%$.

The model parameters with infinite number of the distributed lags as per (1) and Koyck transformation will be the following:

$$\hat{Y}_t = 16464.8 + 0.5489 I_t + 0.4531 I_{t-1} + 0.3739 I_{t-2} + 0.3086 I_{t-3} + 0.2547 I_{t-4} + \ldots \quad (5).$$

Thus, 1 ruble of investments brings increase in GDP for 54.9 kopeks on annual basis. Parameter λ ($\lambda = 0.825335$) represents decrease coefficient or decrease in variables. Therefore, by the time of t+1, i.e. in a year, the result (GDP) will increase on $b_0\lambda$ =0.453 or for 45.3 kopeks, by the time of t+2 – on $b_0\lambda^2$= 0.309 or for 30.9 kopeks, in three years on - $b_0\lambda^3$ = 0.255 (25,5 kopeks), etc. Based on the calculation the long-term multiple was equal to 3.142717. It means that 1 million rubles invested today in fixed capital, eventually, will lead to increase in GDP by 3.14 million rubles.

All coefficients of regression have similar signs, i.e. are characterized by the unidirectional change during the studied time frames. In the current year 17.46% of the overall impact of investments on GDP are achieved. In a year – another 14.41%, in two years – another 11.89%, through three – another 9.81%, etc., through 10 years – only 2.11%, and in 15 years we will receive only 0.98% of impact of invested funds, but after all we will achieve extra result and we observe the diminishing impact throughout very long time.

The median lag was less than 5 years, i.e. increase in investments into fixed capital by 1 million rubles will lead to GDP growth in five years at a size which is more than a half of the long-term multiple, i.e. on 2.94 million rubles today.

Thus, the economical and statistical analysis above confirms the fact that increase in volume of the investments in fixed capital promotes steady economic growth both in short-term and in long-term perspective.

Main Results of The Study

At the same time, search of financial sources for investments into the real sector of economy remains an essential problem. Quantitative data analysis for 2013 - 2020 period reveals positive trends in economy. According to data from figure 1 GDP grew by 37060.3 billion rubles and investments into fixed capital increased for 9253.3 billion rubles during respective period.

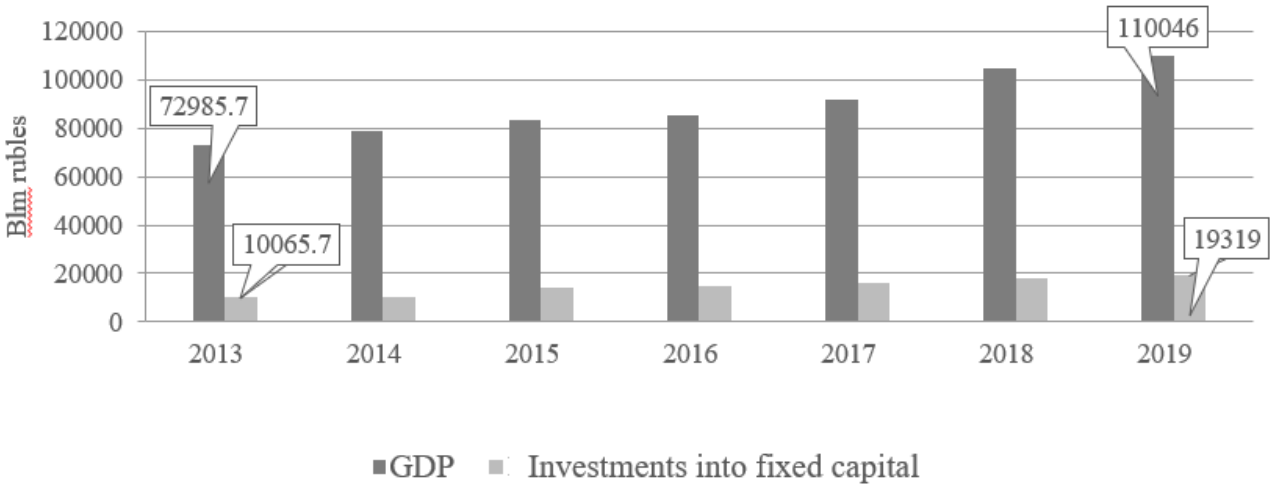

Fig. 1: GDP and investments into fixed capital dynamics for 2013 – 2019 [5]

Based on data represented on figure 2, share of own funds prevails other sources of financing of investments into fixed capital. In 2019 the share of own funds was 55.1% while the share of credit sources was 44.9%. Moreover, for the analyzed period the share of own funds while being the main financial source for investments for the companies of the real sector of economy even increased by 9.9 percentage points.

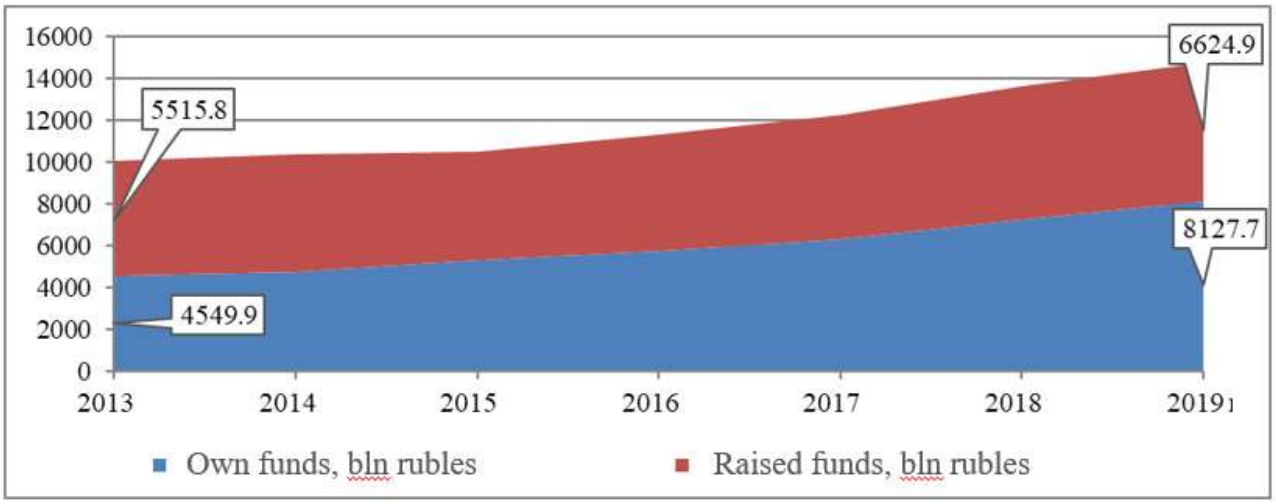

Fig. 2: Structure of financial sources of investments into fixed capital
[composed by authors based on the data provided by the Federal service of state statistics]

At the same time, it should be noted that despite significant growth of the investments, currently over half of all fixed assets of the organizations of the real sector is outdated. For the analyzed period the degree of wear of fixed assets increased by 3.1 percentage points and achieved 51.3%. At the same time during 2013 - 2019 annual rates of fixed assets' upgrade and disposal were stable. For example, according to the data provided in table 1, coefficient of fixed assets upgrading of the enterprises of the real sector of economy increased by only 0.1 percent point as well as the disposal coefficient which remained at the level of the previous years – 0.7.

Table 1: Upgrade and disposal rates of fixed assets of the enterprises of the real sector of economy in 2013-2019

Indicator	Years						
	2013	2014	2015	2016	2017	2018	2019
Share of fixed assets upgrade	4.6	4.3	3.9	4.4	4.3	4.7	4.7
Share of fixed assets disposal	0.7	0.8	1	0.8	0.7	0.7	0.7
Degree of wear of fixed assets, %	48.2	49.4	47.7	48.1	50.9	50.9	51.3

Non-financial organizations experience twofold effect at the same time: the lack of funds for investments and the growth of own funds' share in structure of sources of the investment financing in fixed capital. It could be explained by complexity of access for the entities of the real sector of economy to leveraged financing. At the same time the scarce of own funds leads to insufficient financing of investment for modernization of fixed capital.

Data on figure 3 illustrates that budget financing have the biggest share among sources of investments into fixed capital. One of the smallest shares belong to foreign investments, state non-budget funds and others. The share of bank lending decreased by 0.3 percentage points as well as corporate lending – by 1.4 percentage points, budget financing – by 2.9 percentage points and foreign investments – by 0.3 percentage points.

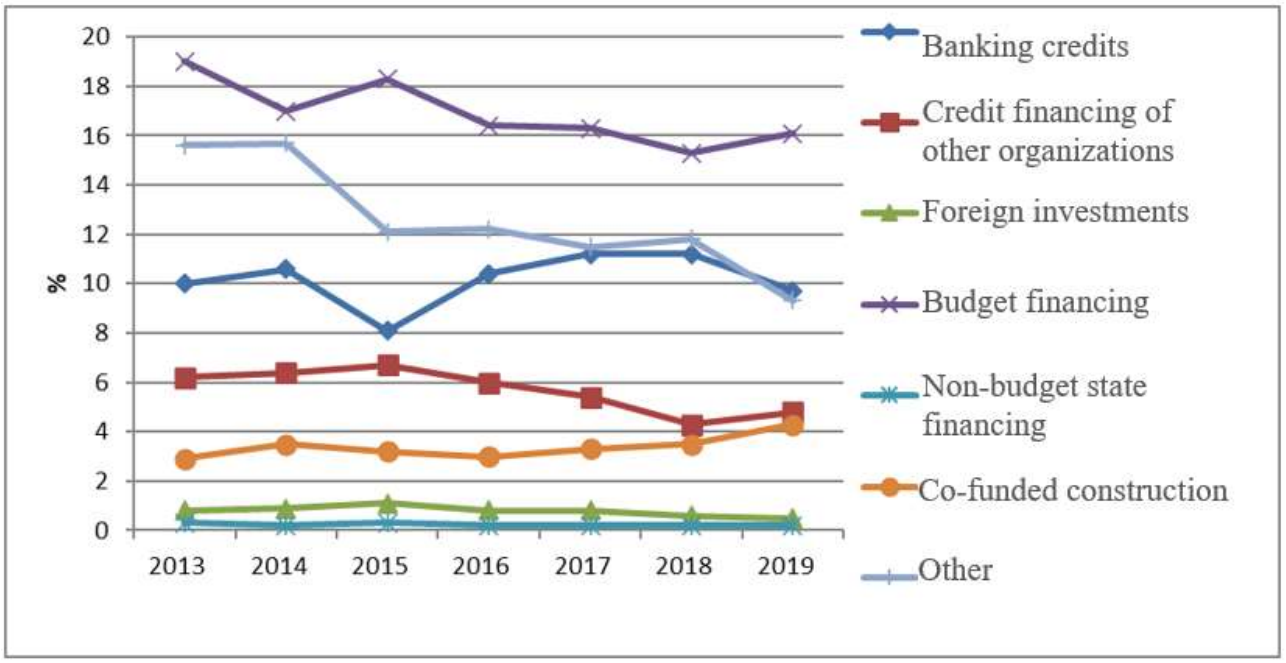

Fig. 3. Structure of the raised funds for investments into fixed capital by sources [composed by authors based on the data provided by the Federal service of state statistics]

Decrease of the bank lending share in structure of the raised funds testifies dilution of the banking sector role in granting investment resources. Fund raising on financial markets could be an alternative source of financing. During 2013-2019 period the volume of issued debt securities of non-financial organizations increased by 3.5 times and reached 7344 billion rubles as of January 1, 2020. The use of financial markets for fund raising proves both the limited choice of financing resources and efficiency of this tool for financing of investment projects.

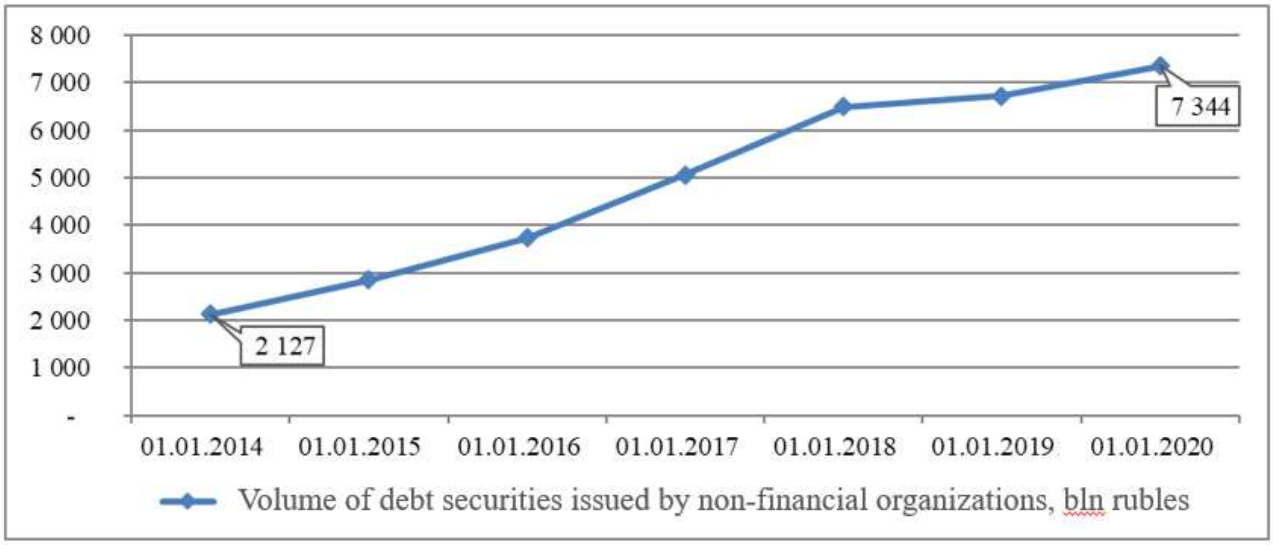

Fig. 4. The volume of issued debt securities of the non-financial organizations in 2014-2020 [composed by authors based on the data provided by the Bank of Russia]

The need for investments into fixed capital is best observed among the key directions of investments. The largest volume of investments into fixed capital goes for buildings and construction works as well as machines and the equipment (39.5% and 36.9% respectively in 2019). The smallest shares of investment belong to housing and other purposes – 13.2% and 10.4% respectively in 2019. Also, the share of investments into buildings and construction works decreased by 2 percentage points as well as in machines and the equipment – by 1.9 percentage points.

Table 2: Structure of investment into fixed capital by directions, %

Directions of investment	Years							Change, +/-
	2013	2014	2015	2016	2017	2018	2019	
Housing	12.5	14.5	15.6	14.7	13.6	13.1	13.2	0.7
Buildings and constructions works	41.5	40.8	43.7	44.7	43.8	42.4	39.5	-2.0
Machines, equipment, vehicles	38.8	36.3	31.5	31.5	33.7	35.3	36.9	-1.9
Other	7.2	8.4	9.2	9.1	8.9	9.2	10.4	3.2
Total investments	100.0	100.0	100.0	100.0	100.0	100.	100.0	0.0

Credit capabilities of commercial banks could become the driver of investment activity growth for the organizations of the real sector of economy as commercial banks historically are that institute which provides transformation of savings into investments. Potential of a banking system could be proven from liquidity perspective. According to figure 5 for the analyzed period the instant liquidity ratio increased by 79.1 percentage point, the current liquidity ratio increased by 103.3 percentage points and the long-term liquidity ratio decreased by 37.8 percentage points.

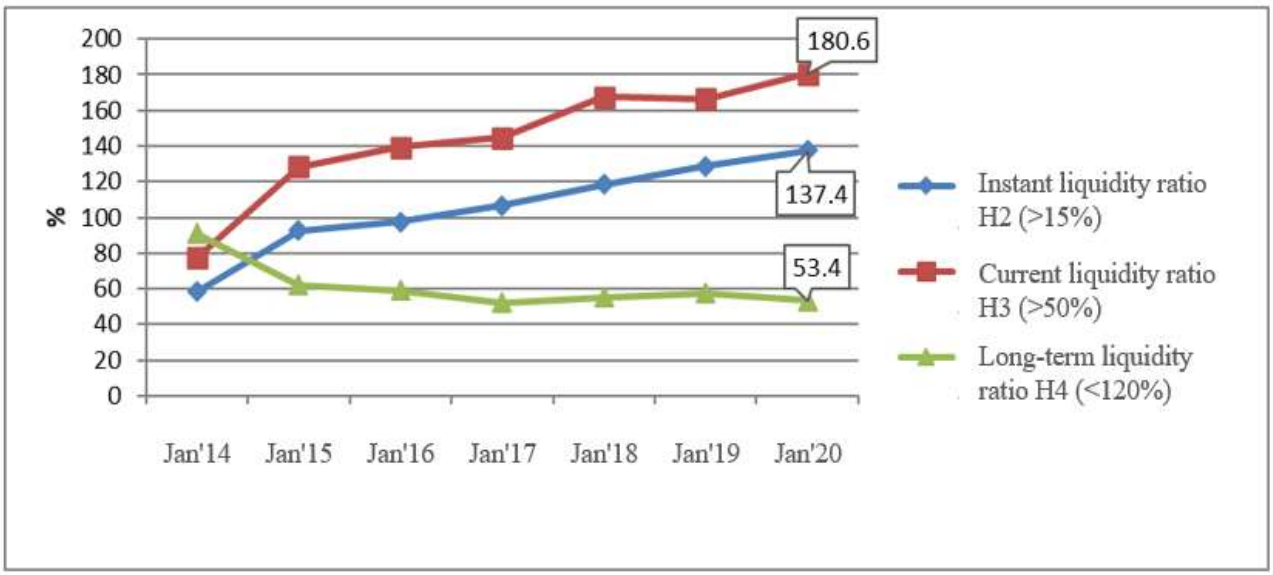

Fig. 5. Banking sector liquidity indicators in 2014-2019
[composed by authors based on the data provided by the Bank of Russia]

Improvement of liquidity indicators of the banking sector illustrates excess of liquidity and simultaneously the lack of financial resources for enterprises and their need for the investment capital.

The steady growth of assets' volume and profits of the banks as well as the issued credits to the non-financial organizations is well observed during analyzed period. In 2019 assets of the banking sector were 96581 billion rubles or 88.3% of GDP. During the last 7 years the profit of the banking sector increased twice and approached 2037 billion rubles or 1.85% of GDP. The volume of the issued credits to the non-financial organizations has grown by 11277 billion rubles or for 50.1%.

While at the same time it is important to mention that the share of the credits in fixed capital in structure of the credits to the non-financial organizations in 2019 was only 4.25% or 1.3% of GDP (Table 3).

The carried-out analysis indicates that despite the fact that the banking sector demonstrates healthy positive dynamics of major indicators, the role of banks in financing of investments into fixed capital has been diminishing. Therefore, the influence of banks on overall economic growth is declining. The credit is a great leverage to expand and intensify economic development of the country. However, in Russia the credit is more the second-tier instrument supplying financing only for short-term needs.

Table 3: Indicators of development of the banking sector of the Russian Federation

Indicator	Years							Change, +/-
	01.01. 2014	01.01. 2015	01.01. 2016	01.01. 2017	01.01. 2018	01.01. 2019	01.01. 2020	
Assets of the banking sector to GDP, %	78.5	98.2	99.9	93.1	92.5	90.6	88.3	9.8
The profit of the banking sector to GDP, %	1.36	0.75	0.23	1.09	0.86	1.29	1.85	0.49
The credits to the non-financial organizations to GDP, %	30.8	37.4	40.1	35.2	32.9	32	30.9	0.1
The credits of banks in fixed capital to GDP, %	1.38	1.39	1.02	1.37	1.49	1.46	1.3	-0.08
The credits in fixed capital as share of the credits to the non-financial organizations, %	4.46	3.72	2.55	3.90	4.54	4.58	4.25	-0.21

Conclusions

The carried-out analysis indicates the need of development and execution of measures directed to increase the role of the banking sector in financing of capital investments of the enterprises of the real sector. It is important to provide the non-financial enterprises with available financial resources which will trigger the mechanism of investments into production and to innovation activity. Thus, it is required to choose tools and mechanisms of realization of monetary policy which will allow to hold inflation within the limits prescribed by the Bank of Russia and to stimulate financing of capital investments of the real sector of economy. As a result, the growth in the volume of investment into fixed capital of the enterprises will have a positive impact on GDP growth.

References

- Abbas, Q., Nurunnabi, M., Alfakhri, Y., Khan W., Hussain, A., Iqbal, W. (2020) 'The role of fixed capital formation, renewable and non-renewable energy in economic growth and carbon emission: a case study of Belt and Road Initiative project' *Environmental Science and Pollution Research*, 27, 45476-45486.
- Abramova, M.A., Igonina, L.L. (2018) 'Monetary and credit factors of activization of domestic investment demand in the Russian economy' *Finance and the credit*, T.22. No. 1 (103), 128-143.
- Arsenieva, N.V., Putyatina, L.M., Tarasova, N.V. (2020) 'Methodological aspects of a comprehensive analysis of the fixed capital of machine building enterprises', *Economies*, №8, 73
- Barsukov, M.V., (2018) 'The banking sector in the investment financing in fixed capital of the real sector', *Financial economy*, No. 6, 1144-1147.
- Eliseeva, I.I. (2020) Econometrics: The textbook for higher education institutions M.: Yuright publishing house, 449 pages.

- Official site of the Central Bank of Russian Federation [Electronic resource]. URL: https://www.cbr.ru/ (date of the address 16.05.2021).
- Official site of Federal State Statistics Service [Electronic resource]. URL: www.gks.ru (date of the address 17.11.2020).
- Osinevich, L.M. and Feoktistova, T.V. (2019) 'Modeling of The Relationship Between the Tax Burden and The Results of Innovation Activity', Proceedings of the 34th International Business Information Management Association (IBIMA), ISBN: 978-0-9998551-3-3, 13-14 November 2019, Madrid, Spain, 2618-2629.
- Parusimova, N.I., Krolivetskaya, L.P., Krolivetskaya, V.E. (2019) 'Credit relations of the Russian banks with borrowers of the real sector of economy' *Intelligence. Innovations. Investments*, No. 6, 75-87.