

Financial support of investment process in Russian economy in conditions of limited resources.

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Abstract – Investment activity is an important indication of economic development of the country and one of the main criteria of steady economic growth. Investment intensity greatly influences the solution of major macroeconomic tasks: structural adjustment in national economy, formation of favourable economic and financial climate, development of innovative business, development of competitive products, increase of tax base, replenishment of budget revenues, creating more employment, extension of enterprises' activity, poverty reduction. Enterprises' investment activity is determined by the role of capital investment in the economic development of the country. Increasing the levels of investment provides the growth of industrial production, improvement of innovative capacity, which will contribute to strengthening the position of the country in the world market. To achieve these objectives, it is crucial to create national sound technology of investment and the system of financial security of the investment process in the Russian Federation. Nowadays the problem of developing the system of financial security of the investment process should become one of the important tasks of government economic policy, which is aimed at achieving steady economic growth and cyclical up-ticks in economy in general. In a globalized world and development of knowledge-based economy, the improvement of investment climate is impossible without establishing an effective system of financial security. Thus, today the development of the system of financial security of the investment process is of considerable social and economic importance for the development of the country. To this end, it is necessary to design a further theoretical framework and to develop methodological and practical guidelines to its effective implementation. In this context, the article specifies the basic components of favourable financial and economic climate for the development of the investment process with the modernization of the economy, presents a

regression model that helps to evaluate the degree of impact on the index of investment in the fixed capital in the Russian Federation, its principal sources of formation and establishes the dependence of innovative development from gross and national income. According to the authors, it will contribute to the formation of regional segment of the national innovative system.

Keywords – investment; profit; economic growth; financing; financial security; investment process.

I. INTRODUCTION TO THE PROBLEM

Material welfare of the society is largely determined by the economic efficiency, expressed by the quantity of products and services, offered by the members of this society. For this purpose, they use real assets (land, buildings, equipment, knowledge) that are necessary to produce goods, and financial assets (shares, bonds) that are not directly connected with productive capacity. For a successful turnover of financial assets, it is necessary to apply real assets effectively. In this regard, it appears to be essential to consider the importance of the investment process in Russia's economy. Contemporary steady development is possible only on the base of the systematic approach, which relies on not only basic laws of nature and human development needs in accordance with the society development patterns in general, but also on the development of all economic sectors, transformation of the political system and business. To achieve steady economic growth, financial security of the investment process must be top priority in the state economic policy. Financial security of the investment process and its financial management have relevance for economic and social development of any country, and they require theoretical conceptualization, development of methodological support, provision of practical and methodological guidelines. It should be mentioned that financial management of investment process is especially relevant at present. To increase the effectiveness of investment activity, domestic economic entities aim to pool their financial

resources [16-20]. At the same time, the specificity of investment activity lies in pooling capacities of financial resources of the production sector, the financial sector, human capital, the government sector. The issue of financial resources, above all, accentuates the definition "investment".

I.I LITERATURE REVIEW

It is noteworthy that the category "investment" has a wide range of interpretations in economic literature [10-11, 17]. For instance, J. Keynes [5], while studying the investment process, emphasized the connection between investments and savings. S. Brue and C. McConnell (1993) consider investments as means of production, which are used in the production and delivery of finished goods to a final consumer. W. Sharpe, G. Alexander and D. Bailey [7] interpret investments as an increment of current resources in future cash flow. High development of the financial investment institute contributes to the growth of real investments. The famous American scientist D. Jorgenson, who identified the relationship between tax policy and investment companies, paid attention to development of the theory of investment [3-4]. In his view, the level of taxation in the country affects the level of capital investment. P. Krugman determined the dependence of the size of investment on expectations, the degree of risk and the confidence in the need for investment [6]. In addition, he considered the need to encourage investors to make investments. V.K. Senchagov [12], Academician of the Russian Academy of Natural Sciences, Professor of the Institute of Economics of the Russian Academy of Sciences, in his study of Russia's investment security, singles out as its basic macro-financial condition the following: the profitability of the national economy should be higher than the rate on loans and rates on deposits and above-mentioned inflation. On the basis of a compilation and systematic breakdown of well-known definitions of the category "investment", one can conclude that investments comprise a set of factors to implement the reproduction process, different financial risks, as well as ambiguity and variety of choices. In this connection, investments can be considered to be a category of capital accumulation to implement extended reproduction in the world that is becoming more and more complicated qualitatively.

In the functioning of social production decline in Russia, there is a more severe form of economic crisis, i.e. reproduction decline. The reproduction decline leads to slowing down the process of putting the active part of fixed assets into operation and the delay of its withdrawal. The main reason for such process is the consumption of fixed capital (CFC). Ensuring extended reproduction that implies renewal of productive forces can secure economic development.

I.II STATE HYPOTHESES AND THEIR CORRESPONDENCE TO RESEARCH DESIGN

In conditions of limited resources, the basis for increasing investment activity is the creation of favorable macroeconomic conditions, the improvement of the tax system. Decisions made with respect to investment processes affect the interests of not only the leading investment activities of enterprises, but also the national interests, since a set of private decisions characterizes as a result the productive forces of the country, adapted to the existing economy.

In conditions of limited resources, sustainable development of the economy is impossible without gross accumulation of fixed productive assets. Let us consider the statistical data of the annual increase in the gross accumulation of fixed assets in the leading countries of the world (Tables 1).

TABLE 1. Annual increase in gross fixed capital formation by leading countries, %

Year	Countries						
	Russia	Argentina	China	France	Germany	United States	United Kingdom
2008	-14.4	7.7	9.7	0.9	1.2	-4.8	-4.7
2009	5.9	-14.6	22.8	-9.1	-9.9	-13.1	-14.4
2010	9.1	22.0	11.6	2.1	5.1	1.1	5.9
2011	6.5	19.4	9.1	2.1	7.3	3.7	2.3
2012	-0.1	-7.0	9.2	0.2	-0.7	5.3	0.7
2013	-	3.1	9.4	-0.6	-0.6	2.7	3.4
2014	1.5	-5.6	-	-1.2	3.3	-	6.8

Compiled according to the World Bank:
<http://data.worldbank.org/indicator/NE.GDI.FTOT.KD.ZG>.

In the table, the annual growth of gross fixed capital formation reveals stable dynamics. Russia's performance is inferior to the United States, Britain and Germany. As a result of the economic crisis of 2008, there has been a decline in gross fixed capital formation in all the countries studied. The economy of China has felt most stable. The table shows that the annual increase in gross fixed capital formation is of wave character. The Russian economy shows strong performance in 2006-2007. There is an increase in the gross accumulation of fixed capital, outstripping the developing countries and repeatedly outstripping the developed countries. 2008 passed quite steadily, the Russian economy in 2009 was one of the worst indicators. A small recovery in 2010 shows that the advantage of the Russian economy over developing countries has been lost. But in 2011, there is hope for recovery, the crisis equalized the indicators of Russia and China; the second only to Argentina. In 2012, there is again the decline and lag behind the stabilized China. Starting in 2013, Russia has a loss of advantage and lag not only from actively developing countries, but also from economically developed countries. One of the strongest declines in the annual growth of gross fixed capital formation in the Russian economy shows a significant reduction in investment volumes, an obstacle to the planned overcoming of the backlog of the world's leading economies, industrialization, the often discussed and much-needed import substitution under modern conditions. The crisis in the economy is more responsive to the gross fixed capital formation than the gross domestic product. Indicators of annual growth in gross fixed capital formation are affected

by a decrease in the expected reduction in revenues, and their reduction reduces production capacity, reducing future indicators of gross domestic product. Gross fixed capital formation is an important indicator of the economy of any country, reflecting not only investment costs, but also more accurately characterizing the state of the economy itself. In the situation of acute investment deficit, the decline in the efficiency of investment activities has an extremely negative impact on economic growth and development. The idea of modernizing Russia in conditions of limited resources requires an increase in investment, that is, an increase in the norms of gross accumulation.

II. IMPORTANCE OF THE PROBLEM

A contemporary situation of a decrease of investment activity in productive infrastructure means that national economy is unable to overcome the situation in question without assistance. For this purpose, it is necessary to take a set of measures of government regulation and to provide financial cost that can stimulate the investment process. Otherwise, the only hope is to attract external capital, which in its turn can put economic security at risk. As a result, one has to acknowledge that there are signs of financial crisis in Russia's economy, i.e. destruction of fixed capital, unprofitableness, insolvency, concealment of financial flows, reduction of tax base, etc. The current situation implies exhaust of the depreciation base, loss of investment potential, a decay of investment activity, an increase of production cost and deterioration of enterprises' financial situation, a reduction of product competitiveness and production efficiency. The absence of necessary measures can result in a more severe scenario and unpredictable consequences. The urgency of innovative substitution of worn out equipment and technologies, as well as the importance of updating the production of the branches of the national economy is evident in the process of the development of strong economy. It must be emphasized that the enterprises' financial situation is inextricably linked to the development of the tax base and enterprises' capacity to pay taxes. Ensuring a balance between investment cost and financial capacity involves searching for financial resources and their types [13-15].

III. RESULTS

It is known that the main source of financing investment activity is enterprises' own means, which are generated by depreciation charges and enterprises' profit. It should be mentioned that the transition to a new technological level must be done at least in the form of technical re-equipment when an outdated technological complex is substituted by a new one based on new principles, a different structure and configuration. Expenditure on major repairs with the help of investment increases the cost of fixed assets and coefficients of renewal, but does not lead to the withdrawal of outdated fixed assets, excludes overcoming obsolescence and increasing production efficiency. Ensuring competitiveness means complex innovative substitution of 85 % of valid active part of economy's fixed assets in 10 years. At a lower rate, modern advanced equipment, not older than 10 years, can inevitably turn into technically worn out and depreciated. It is necessary to increase annual withdrawal of fixed assets that implies drastic change of volumes, direction and structure of

investment in economy. Taking into consideration depreciation of fixed assets, there are grounds to suspect that enterprises' own sources, which are being formed because of the need to finance investment activity, currently appear to be in a dire state. That means that depreciation of fixed assets cannot secure the production process properly and that can result in a negative influence on profit formation and, consequently, on the formation of the tax base. In 2016, in the Russian Federation, enterprises' own means accounted almost 70% of the entire bulk of investment (Tables 2, 3).

TABLE 2. Expenditures on organizations' technological innovations according to the sourcing, %

Year	Index						
	Expenditure on technological innovations	Own means of organization	Means of the federal budget	Means of budgets of constituent entities of the Russian Federation	Means of off-budget funds	Foreign investments	Other assets
2005	100.0	78.7	4.4	0.7	0.1	1.5	14.6
2006	100.0	77.3	2.9	1.1	0.1	0.6	18.0
2007	100.0	79.6	3.8	0.4	0.1	0.3	15.8
2008	100.0	72.3	2.8	0.3	0.1	0.1	24.4
2009	100.0	74.0	3.3	0.1	0.0	3.5	19.1
2010	100.0	69.1	4.7	0.3	0.0	2.7	23.2
2011	100.0	69.6	4.7	0.2	0.1	1.1	24.3
2012	100.0	73.3	7.3	0.2	0.6	1.1	24.5
2013	100.0	63.4	6.3	0.2	0.1	2.7	15.9
2014	100.0	65.6	6.1	0.2	0.3	0.5	29.5
2015	100.0	69.3	9.9	0.3	0.1	0.1	27.7
2016	100.0	68.0	9.0	0.3	0.1	0.2	20.2

Based on "Russia's Industry 2016", stat. comp., Moscow: Rosstat, 2016, 347 p.

According to the data given in Table 1, it is safe to say that only those expenditures on technological innovations of organizations are substantial that are financed from the budget of these organizations, whereas budgetary funds leave best to be desired.

Data presented in Table 3 characterize sourcing into the fixed capital in Russia's economy. One should pay attention to the fact that enterprises' own means and attracted ones have the largest indices.

For enterprises, the main source of developing investment resources is profit formed in the process of economic activity. The higher the enterprise profit is, the less is the need for attracting external sourcing. Profit reproduction in the conditions of successful economic activity is accomplished based on an extended basis. Enterprises' own means in investment into fixed capital make a considerable share.

Profit is the result of skillful and successful doing business in the first place, and it is not always a guaranteed income of a businessperson. At the same time, the provision of steady economic growth with financial resources is seen in the whole economy meaning of profit [8].

TABLE 3. Sourcing into the fixed capital in Russia's economy, % to the total.

Year	Index						
	Investment into the fixed capital	An organization's own means	Profit accumulation	Depreciation	Attracted means	Bank credits	Budgetary means
2005	100.0	44.5	20.3	20.9	55.5	8.1	20.4
2006	100.0	42.1	19.9	19.2	57.9	9.5	20.2
2007	100.0	40.4	19.4	17.6	59.6	10.4	21.5
2008	100.0	39.5	18.4	17.3	60.5	11.8	20.9
2009	100.0	37.1	16.0	18.2	62.9	10.3	21.9
2010	100.0	41.0	17.1	20.5	59.0	9.0	19.5
2011	100.0	42.7	17.2	21.6	57.3	7.7	18.8
2012	100.0	41.9	17.9	20.4	58.1	8.6	19.2
2013	100.0	44.5	19.5	19.6	55.5	8.4	17.9
2014	100.0	45.2	18.9	22.5	54.8	10.0	19.0
2015	100.0	45.7	19.0	18.8	54.3	10.6	17.0
2016	100.0	50.2	18.3	22.2	49.8	8.1	18.3

Based on "Russia's Industry 2016", stat. comp., Moscow: Rosstat, 2016, 347 p.

IV. METHODS AND MATERIALS

The main research method is correlation-regression analysis.

Numerous studies show that the optimal method for assessing the degree of influence of factors on the development of the investment process is the correlation-regression analysis, which task is to construct an econometric model that allows by values of various indicators to obtain estimates of the values of the dependent variable. At present, correlation-regression analysis is the main means of investigating the dependencies between economic variables.

In this paper, the authors present correlation and regression analysis that allows evaluating the degree of influence of the sources of forming the index of investment into Russia's fixed capital. As a productive indication, the authors have chosen an index of investment into the fixed capital (Y) that more fully reflects the investment process in the country. As factor indications (X) that influence the dynamics of the studied indication, the authors have chosen the following sources of formation:

X_1 – index of accumulation funds in the Russian Federation, % to the previous year;

X_2 – index of depreciation in the Russian Federation, % to the previous year;

X_3 – index of attracted bank credits, % to the previous year.

Initial data to fulfil the correlation and regression analysis are presented in Table 4.

TABLE 4. Initial data for making the correlation and regression analysis of the degree of influence of the sources of formation on the index of investment into the fixed capital in the Russian Federation, % to the previous year.

Year	Index of investment into the fixed capital in the Russian Federation (Y)	Index of accumulation funds in the Russian Federation (X_1)	Index of depreciation in the Russian Federation (X_2)	Index of attracted bank credits (X_3)
2005	127.9	130.1	129.8	192.4
2006	110.0	87.7	128.9	146.5
2007	126.5	118.0	138.2	137.6
2008	124.2	134.3	116.1	152.9
2009	128.9	137.9	119.4	134.6
2010	132.7	130.4	121.6	155.6
2011	130.8	134.0	127.2	150.5
2012	129.6	123.4	127.3	146.7
2013	91.1	78.1	95.8	79.6
2014	110.8	118.4	124.4	96.6
2015	117.3	118.6	123.4	100.8
2016	119.1	114.0	1215	101.1

The methods of correlation analysis help to establish interconnection between the phenomena. The basis of measuring the connections is made by the matrix of pairwise correlation coefficients. This matrix shows strong connection between factors and productive indication.

The research has resulted in the matrix of pairwise correlation coefficients, which is presented in Table 5. Within this study, the authors determined probabilities of making a hypothesis about their insignificant impact (p), limits 0.1 (or 10%). All calculated coefficients have a positive value that proves the influence of indices of accumulation funds (X_1) and of attracted bank credits (X_3) on the index of investment in the fixed capital (Y). The index of depreciation in its turn has a lesser impact on the productive indication.

TABLE 5. Matrix of pairwise correlation coefficients.

	Y	X_1	X_2	X_3
Y	1	0.886	0.646	0.720
	-	$p = 0.000$	$p = 0.047$	$p = 0.014$
X_1	0.886	1	0.425	0.539
	$p = 0.000$	-	$p = 0.215$	$p = 0.078$
X_2	0.646	0.425	1	0.538
	$p = 0.047$	$p = 0.215$	-	$p = 0.068$
X_3	0.720	0.539	0.538	1
	$p = 0.014$	$p = 0.078$	$p = 0.068$	-

The analysis of the given matrix of pairwise correlation coefficients allows taking into account all three chosen factor indications, as there is no multicollinearity between them. An

indication of presence of multicollinearity is the value of correlation coefficient $r > 0.8$.

To create a regressive model, it is necessary to reveal analytical dependence of an economic phenomenon from certain factors, i.e. to make a function, in order to determine the nature of the degree of influence of these factors on the function:

$$Y = f(X_1, X_2, \dots, X_k). \quad (1)$$

The study of interdependence between the function and one of the factors usually has little effect because economic phenomena, as a rule, are multifactorial, and there are also complex interrelationships between the factors.

As a result, we have generated a regression equation of the following type:

$$Y = 21.496 + 0.466 X_1 + 0.247 X_2 + 0.103 X_3, \quad (2)$$

where Y – an estimated value of the productive indication.

A regression coefficient is considered significant if present value of Student's t-test is more than the one given in the table. All factor indications that caused regression coefficients insignificant are excluded from the regression equation, and the process of creating a model is repeated, i.e. it starts from the very first step of regression analysis, and the regression equation is generated only on those independent variables that made the coefficients significant. Then the value of the regression equation and its coefficients is tested again. These actions are repeated until the equation has only those factors that have significant coefficients.

With the probability of 0.90, the received regression coefficients of a multifactorial model should be acknowledged significant only for factor indications X_1 and X_3 as the probability of making a reverse hypothesis in their regard does not exceed 0.1. At the same time, the probability of making a reverse hypothesis regarding factor indication X_2 (index of depreciation growth) appeared to be higher – 0.102 (Table 5).

With the help of F-test, they verify the significance of a regression equation, while the value of particular regression coefficients is tested with the help of Student's t-test. A regression coefficient is considered significant on condition that the value of Student's t-test is more than the one, given in the table.

TABLE 6. The results of the regression analysis based on three factor indications.

Correlation coefficient $R=0.953$. Coefficient of determination $RI=0.873$			
Criterion value $F(3,8)=26,260, p<0,0002$			
	Parameters of the equations	The value of Student's t-test (I)	The level of significance
<i>Constant</i>	23.659	1.448	0.186
X_1	0.427	5.057	0.001
X_2	0.282	1.848	0.102
X_3	0.089	1.705	0.098

Coefficients X_1 and X_3 are considered significant, while factor indication X_2 is excluded. In this connection, there is a regression equation, which comprises two factors:

$$Y = 49.518 + 0.457X_1 + 0.128X_3 \quad (3)$$

F-test with the significance level of 90% demonstrates the significance of a generated equation and the factor indications, included in it.

Accordingly, it could be affirmed that profit serves a financial source of an enterprise's investment activity. Economic and financial potential decreases because of unprofitable enterprises, which have no opportunity to perform investment activity. Unprofitable enterprises make 30% of the total number in the Russian Federation. It is difficult to develop innovative and investment activity of such enterprises and to increase their competitiveness without a comprehensive and effective approach to the solution of their problems. Unprofitability is quite disadvantageous for enterprises, which generally affects the production of the entire national economy. In addition, it must be said that, according to statistics, the share of profitable organizations is rather low. From 2005 to 2016, Russia's economy had non-permanent results of financial performance according to gross and net profit (profitable enterprises were also affected), therefore innovation and investment activity of a number of Russian enterprises did not have a sustainable resource base.

V. CONCLUSION

With regard to huge volumes of innovative upgrading of production and extreme shortage of capital investment, the issue of financial security of the investment process is especially relevant; however, it does not attract proper attention of specialists. Meanwhile, in practice, official statistics and economic policy, there is perception of expenditure on repair and modernization of valid fixed assets with the help of investment, and modernization of maintenance of operated equipment with the help of investment activity, which grossly distorts real evaluation of the process of fixed assets reproduction and economic development on the whole. Absence of proper measures threatens with irreparable consequences. At present, the primary task is to overcome economic breakdown via its vigorous innovative renovation. In Russia, the process of substitution of each outdated workplace with a modern one helps to overcome economic crisis – it will result in the growth of productivity and wages, greater profits and profitability of economic activities, revival of the paralysed process of fixed assets reproduction. The intensification of enterprises' investment activity is crucial for improving the situation and recovery from crisis.

Recently, there has been a tendency in Russia's economy to reduce a number of unprofitable enterprises; however, low profit margins remain, and it results in the absence of the tax base on several taxes, particularly, on enterprises' income tax. The correlation and regression analysis determined the impact of profit on enterprises' investment activity, which means that it is safe to say that the development of tax base on profit tax can be a sign of unwelcome changes in the use of factors of production (labour and capital), generating ineffective

combination of these factors, thereby reducing enterprises' innovation and investment activity [1-2, 9].

Investment directly depends on the profit left after paying taxes. In connection with it, there is a tendency in developed countries that leads to the reduction of effective rates of income tax and to the development of optimal taxation.

A developed mechanism of financial security will contribute to empowerment and impetus for effective investment into real economy, which is the main condition of economic growth.

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