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INNOVATIONS IN THE REGIONAL AGRO-INDUSTRIAL COMPLEX

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Abstract

The aim of the study is evaluating the modern level of the innovative activity determining bottle necks thwarting progressive and dynamic development of the regional innovative process, searching the ways of increasing economic efficiency of the innovative activityand developing methods of objective evaluation of innovations.

The following methods were used in the study process: monographic, analytical, systematic approach to studying economic phenomena, index analysis.

Conclusions: In order to activate the innovative process it is necessary to have the state financial support, more liberal regionalregulatory framework stimulating innovations increase, clever algorithm of innovative activity evaluation making possible to evaluate profitability of an innovative project.

Keywords: *innovations, investments, marketing innovations, profitability, technological innovations.*

JEL Classification: *O 31, Q13, R11*

1 Introduction

It is recognized at the state level that innovations are one of key directions for the successful development of the national economy. Moreover – in the priority order – innovations must concern the production industries which include the agrarian sector. Experience has proven that the introduction of innovations in this particular field of production activity is a very complex process. This is due to the specific nature of agricultural production, namely, the seasonality of the need for credit,

production etc. The introduction of scientific developments in the agro-industrial complex (AIC) involves a number of specific features which traditionally include the duration of the innovation development cycle in comparison with industry. Therefore it is impossible to obtain quick income here. And, as a rule, innovations are aimed at improving previous technologies as well as creating some new ones which do not produce an immediate effect and the lack of financial resources, the weakness of the market and competition hinder the development of innovations. The current stage of the regional economy development indicates that there are no large positive changes in the creation of an innovation system but there is an inertial development with low profitability of innovative projects and their low financial support by federal and regional budgets.

It has been proved by studies that in order to carry out the successful transfer of the agro-industrial complex to the innovation-based development, appropriate socio-economic conditions should be created, in particular, for the AIC to be a highly profitable sector, support of the innovation process at the state level is necessary and the domestic financial resources should play a decisive role in innovations financing. It is also necessary to carry out revolutionary technological transformations corresponding to the level of world standards [2]. Today the regional park of agricultural machinery is worn by 65…70 %, besides it is morally and physically obsolete. All this indicates that it is problematic to produce high-quality products meeting world standards on such a material basis [1]. The lag of the Russian Federation from the advanced countries in terms of the technical and technological potential of the agro-industrial complex is so great that it requires the adoption of government measures. Therefore the key direction of solving this strategically important problem is state support for investments and innovations as evidenced by the practice of many modern developed countries such as Germany, France andthe USA. Today Russia's policy in the field of agriculture contributes to attracting foreign capital and its flow is growing every year but the growth rate is not high. It is possible to attract foreign capital to the country or the region by creating an attractive innovative and investment climate and a deeply thought out tax and financial policy. All this must be taken into account when carrying out innovative activities. Each region in pursuance of the decisions of the Government of the Russian Federation strives to stimulate the introduction of innovations and to finance them both at the expense of regional and federal resources. In order for this process to be supported by a regulatory framework at the regional level laws and regulations promoting the development and support of innovative activity are developed respecting an important principle - regional legislation should not conflict with federal law.

2 Data and Methods

Ryazan oblast was one of the first in the Central Federal District to support the initiative of the Government of the Russian Federation in the field of innovation development and in November 2006 Ryazan Oblast Law No. 138-OZ "On Innovative Development and State Innovation Policy of the Ryazan Region" was adopted [3]. The creators of the aforementioned law saw the main goal of creating favorable conditions for innovation activity in the region and transferring the regional economy to an innovative way of development. In accordance with the goal one of the main tasks of this law was the creation – at the initial stage – of an innovation infrastructure that is the material base on which the region will rely in the process of developing and implementing a regional innovation policy. The region forms the regional target program for the development of innovation activities. It includes separate innovative projects and subprograms, comprehensive expertise and competitive selection of innovative projects are carried out. Examination is carried out on the subject of economic efficiency and payback period includes environmental and social justification, scientific and socio-economic significance. Organizations carrying out innovative activities have certain privileges within the framework of local taxation such are the benefits established by regional legislation for priority or major investment projects of an innovative orientation. So the Law of Ryazan Oblast No. 33-OZ "On State Support of Investment Activity on the Territory of Ryazan Oblast", dated April 6, 2009, provides the reduction of the corporate profit tax rate in the part credited to the regional budget. Specific amounts of benefits are set by the Law of Ryazan Oblast "On Tax Benefits" dated April 29, 1998. The property tax for basic projects is reduced from 2.2 % to 1.1 % and the profit tax goes down from 20 % to 18 %. The property tax for priority projects can be reduced from 2.2 % to 0.6 % and the profit tax goes down from 20 % to 16 %. Among the list of paramount measures to improve the system of updating the material and technical base of the agricultural sector there are preferential taxation conditions for transaction participants. We consider that it is long overdue to exempt the innovation process participants from paying 18 % value added tax for the period of mastering innovations. The final goal of innovations is the growth of economic efficiency of production, in particular, for the agro-industrial complex these are the rational land use, current and fixed assets, labor resources and saving material and monetary costs.

3 Results and Discussion

The practical regional experience in introducing innovations into the production activities of enterprises of the agro-industrial complex shows that this process is of limited nature. So the share of organizations engaged in innovation activity is low in the region and the growth rates are extremely low in time so one can confidently say that when such a modest growth dynamics, the process of mastering innovations will take a long time. (Table 1)

Table 1 **Innovative activity of the region for 2012-2016**

Parameters	2012	2013	2014	2015	2016	Changes for the period, %
Ratio of organizations having innovative activity,%	11.0	11.4	13.1	13.8	14.1	128.1
Ratio of organizations having technological innovations,%	9.8	10.5	11.3	11.6	12.1	123.4
Ratio of organizations having organizational innovations, %	3.4	4.6	3.0	3.1	3.2	94
Ratio of organizations having marketing innovations, %	3.1	3.1	1.8	2.1	2.0	64.5

A key role in the structure of regional innovations is played by technological innovations which represent the final result of the innovative activity in the form of a new or improved product or service introduced at the market. There is a positive trend in this direction but there is no growth in organizational and marketing innovations.

The study identified some factors limiting the innovative activity in the region which can be reduced to the following main ones, namely, the lack of own financial resources of organizations – 60 %, the lack of financial support of the state – 42 %, the high cost of innovations – 56 %, high economic risk – 43 % and low demand for new goods (work, services) – 27 %. These data indicate that the main problem is the lack of sources of financing for innovations.

Innovation activity is connected with capital outlays. Therefore the region had certain expenses in these important directions throughout the whole study period. Table 2 presents the innovative activity expenditures of the region.

Table 2 **Dynamics of innovations expenditures in economic activities of the region, mln. rubles**

Parameters	2012	2013	2014	2015	2016	Changes for the period, %
Total expenditures	6557.9	7251.3	7567.8	7896.5	8124.9	123.8
Those for technological innovations	6247.2	7242.3	7321.7	7754.8	7912.1	126.6
Among them: products	5731.4	6439.1	6865.3	7214.4	7134.7	124.4
processes	515.8	804.2	456.4	540.4	777.4	150.8
Marketing innovations	151.4	1.7	198.1	102.1	174.1	115.2
Organizational innovations	159.3	7.5	48.0	39.6	38.7	24.3

This expenditures structure (Table 2) is positive because more than 90 % of them go for technological innovations which indicate that the region is focused primarily on innovations in the production sector which in modern conditions of its economic development is very important. In the regional structure of innovation expenditures the organization own resources are the largest share (64-73 %), federal budget resources are 7-13 %, budgets of RF subjects comprise 3 % and others are the rest. Such a structure does not allow developing innovative processes purposefully and rapidly as it is focused on own sources which are not enough in the agro-industrial complex. So this structure does not stimulate the innovation process. For a sustained and dynamic growth of innovation activity we believe that federal budget spending should be at least 50 % in the regional structure of innovation expenditures.

The innovation process is a purposeful and continuous process of searching, preparing and implementing innovations that improve production efficiency. Moreover the key areas of innovations today should be considered the modernization of all strategic industries in the region and, first of all, industry and agribusiness i.e. the creation of a modern material and technical base on an innovative component. That means the known procedure for introducing innovations is related to the implementation of current and capital expenditures which in the course of their implementation should bring revenue or profit thus raising the problem of assessing the efficiency of the innovation process.The innovation process is a cost-based process. Its goal is obtaining some economic effect a very significant one. Today scientific literature presents attempts to evaluate the economic efficiency of innovations concerning a certain range of parameters. There are diverse views and various methods to evaluate the innovations efficiency in the modern theory and practice but they are all unanimous that the economic

effect of the innovation process should be evaluated taking into account the costs and revenues during its realization. We suppose that it is quite realistic to evaluate the effect of innovations based on the principles of evaluating the effectiveness of investment activities as the funds spent on the innovation process are nothing more than capital costs. But taking into account this hypothesis it is necessary to consider the temporary assessment of the effect which is connected with inflation processes in any market economy and Russian, in particular, where inflation is much higher than in most developed countries of Europe having a relatively stable economy and very modest inflationary expectations. Thereforeit is necessary to consider the inflation factor when evaluating the efficiency of innovation costs for the national economy because only taking into account all these features will enable us to give objective value of the economic effectas a result of innovations introduction and development. In order to solve the task – from our point of view – the effectiveness of the innovative project can be estimated using the following formula (1):

$$I_{eff} = R(P)/(Ex_i + (Ex_{i*}C_i)) \quad (1)$$

where, R(P)– innovation revenue (profit)

I_{eff} – innovation process efficiency

Ex_i – innovation process expenditures

C_i – coefficient of expenditures adjustment with inflationary expectations.

For the purpose of reliability in calculating the effect of introducing innovations the C_i parameter should be oriented towards the time value of long-term loans provided by the system-forming banks of the country. These interest rates for investment loans should form the basis for an objective evaluation of innovation activity as they are the closest ones to evaluating the current state of affairs at the credit market and more objectively assess its inflationary expectations. There is an opinion that the key refinancing rate of the Central Bank of the Russian Federation can also be taken into account in such calculations and can serve as a guideline for the correction coefficient for inflation but we believe that this parameter is less correct and does not reflect the real level of inflation in the country as the Central Bank usually evens this rate which means it does not allow reliable correction of capital expenditures for innovations in the previous time period and bring them in line with the current level of value.If you are based on rates for long-term loans in calculations then it becomes very important to monitor the price of long-term credit resources provided by large banks to their borrowers as loan rates are constantly changing over time so this coefficient should be constantly adjusted taking into account its dynamics. There is a direct proportion. The

reduction of the Central Bank of Russia key interest rate causes some decrease of the interest rate on commercial banks' credit resources. In modern conditions – from the middle of 2017 and early 2018 – interest rates on long-term loans have had a steady downtrend which indicates some certain reduction of inflationary expectations which were very high after the economic sanctions of the EU and US countries. Let's consider the offered algorithm of calculation and evaluation of innovations efficiency taking into account the time period by the example of an innovative project. We assume that the period of developing and implementing the innovative project is three years as a basis (Table 3).

We will evaluate the efficiency taking into account periods of the year, namely, the quarters - 1, 2, 3 and 4. The calculation technique allows determining the effectiveness of introducing innovations in each specific time interval. Investments for quarter 1 of 2015 are shown at the level of actual expenditures because it is the starting moment of the innovation process. Further investments are subject to adjustment for the time factor according to the above formula. It should be noted that the shorter the time period for expenditures adjustment the more reliable the results obtained. Taking into account the performed calculations it can be noted that the effect of innovation is reduced in all time periods if the time value of investments in innovations is corrected. This algorithm gives – from our point of view – more objective evaluation of the innovation effect and gives more correct economic evaluation of the innovation process efficiency. On the scale of significant innovations investment even small deviations and errors in evaluating the innovation process efficiency result is very considerable financial resources. So according to the proposed algorithm the cumulative capital expenditures brought to the level of the current time amount to 6084.8 million rubles and the capital expenditures for innovations without adjustment for the time period are 5408.9 million rubles thus the difference in the estimate is 675.9 million rubles (6084.8 million rubles - 5408.9 million rubles). This is the restored cost associated with the level of inflation for a three-year period of development of an innovative project that makes objective evaluation of the economic effect of innovation possible. It is also necessary to make some comments on the application of the proposed methodology. In the context of lower inflationary expectations the calculation by this algorithm may be more reliable but, unfortunately, the Russian economy still has very high inflationary expectations contrary to the statements of official authorities about its significant suppression. Even the officially announced inflation rate and the declared refinancing rate of the Central Bank of Russia equal to 8 % are extremely underestimated and do not reflect the real inflation in Russia as evidenced by a more than 2-times rise in prices for goods works and services since 2014.The rates for short- and long-term loans provided to their borrowers

by commercial banks which are much higher than the officially announced refinancing rate of the Central Bank of Russia can also serve as an indicator of the inflation rate.However objectively evaluating the situation it should be pointed out that the inflation rate in the country in 2017 slowed somewhat but this positive process should be approached with a certain degree of caution.The trend towards lowering interest rates for long-term loans at a faster pace than that of lowering interest rates for short-term loans can be viewed as an indication of the state economy stabilization.

Table 3 **Benchmark assessment of economic efficiency of the innovative project adjusted for time lag**

Parameter	2015					For 3 years
	1 quarter	2 quarter	3 quarter	4 quarter	Whole year	
Total expenditures for innovations, mln.rub., including:	561.6	555.4	678.2	609.9	2405.1	7689.9
capital (Ei)	488.0	432.0	543.4	478.2	1941.6	5408.9
current	73.6	123.4	134.8	131.7	463.5	1831.0
Revenues from innovative process for implementation period, mln.rub. (R)	84.2	77.8	56.9	76.8	295.7	1298.9
Average year interest rate on investment loans provided by commercial banks to production enterprises in the country (region), % (Ci)	17.0	17.0	16.5	15.5	16.5	14.1
Progressive total investment provided by current time, mln. rub.	508.7	450.3	565.6	496.3	2020.9	6084.8
Innovative process efficiency with adjustment for time period (Ieffadj.), %	16.5	17.2	9.9	15.4	14.6	21.3
Innovative process efficiency without adjustment for time period (Ieff), %	17.2	18.0	10.3	16.0	15.2	24.0
Adjusting deviation, %.	-0.7	-0.8	-0.4	-0.6	-0.6	-2.7

Parameter	2016					For 3 years
	1 quarter	2 quarter	3 quarter	4 quarter	Whole year	
Total expenditures for innovations, mln.rub., including:	621.1	513.8	577.4	617.7	2309.3	7689.9
capital (Ei)	453.2	356.9	432.1	438.9	1660.4	5408.9
current	167.9	156.9	145.3	178.8	648.9	1831.0
Revenues from innovative process for implementation period, mln.rub. (R)	123.7	134.5	116.4	114.9	489.5	1298.9
Average year interest rate on investment loans provided by commercial banks to production enterprises in the country (region), % (Ci)	14.5	14.0	13.5	13.0	13.7	14.1
Progressive total investment provided by current time, mln. rub.	469.6	369.3	446.6	453.1	1738.6	6084.8
Innovative process efficiency with adjustment for time period (Ieffadj.), %	26.3	36.4	26.0	25.3	28.1	21.3
Innovative process efficiency without adjustment for time period (Ieff), %	27.0	37.6	26.9	26.1	29.4	24.0
Adjusting deviation, %.	-0.7	-1.2	-0.9	-0.8	-1.3	-2.7

Parameter	2017					For 3 years
	1 quarter	2 quarter	3 quarter	4 quarter	Whole year	
Total expenditures for innovations, mln.rub., including:	869.7	755.8	743.2	731.2	2975.5	7689.9
capital (Ei)	578.1	567.9	567.8	543.1	2256.9	5408.9
current	167.2	187.9	175.4	188.1	718.6	1831.0

Parameter	2017					For 3 years
	1 quarter	2 quarter	3 quarter	4 quarter	Whole year	
Revenues from innovative process for implementation period, mln.rub. (R)	124.4	121.6	132.6	135.1	513.7	1298.9
Average year interest rate on investment loans provided by commercial banks to production enterprises in the country (region), % (Ci)	13.0	12.5	12.0	11.0	12.1	14.1
Progressive total investment provided by current time, mln. rub.	596.9	585.6	584.8	558.0	2325.3	6084.8
Innovative process efficiency with adjustment for time period (Ieffadj.), %	20.8	20.7	22.6	24.2	22.0	21.3
Innovative process efficiency without adjustment for time period (Ieff), %	21.5	21.4	23.3	24.8	22.7	24.0
Adjusting deviation, %.	-0.7	-0.7	-0.7	-0.6	-0.7	-2.7

4 Conclusion

Understanding at all levels of government and management that the priority is to attract domestic and (or) foreign capital to innovations and investment activities and not just long-term lending for these areas is an element of sustainable development of the country's economy. Of course the way out of the crisis situation and the stability of its economy is also reducing dependence on the export of raw materials and developing its own production of the main types of marketable products.

The presented evaluation of the cost of the innovative projects effect gives – in our opinion – a fairly objective picture of the innovations profitability which the investor must ultimately take into account by investing in an important strategic project and make the most correct decisions in a case of some alternative variants for their implementation. Here it is necessary to conduct their comparative alternative analysis using the recommended calculation algorithm. It is possible to apply this evaluation algorithm successfully at the regional level, developing

and implementing innovative projects in the agro-industrial complex, developing current, prospective financial plans in which innovation funds are provided.

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