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Влияние инновационного развития на экономическую безопасность региона

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Аннотация. В статье авторы предлагают оценивать экономическую безопасность региона, используя показатели, применяемые для федерального уровня и отраженные в Стратегии экономической безопасности Российской Федерации до 2030 года. Так как не все показатели, зафиксированные в этой Стратегии, применимы для регионального уровня государственного управления, авторы предлагают проводить анализ экономической безопасности по четырем направлениям: доля региона в общем объеме национальной экономики; демографическая ситуация; ситуация на рынке труда и доходы населения; степень инновационного развития экономики. После анализа экономической безопасности Воронежской области по указанным направлениям авторы выявили основные угрозы для данного региона. В сфере формирования и распределения доходов населения авторы выявили существенную степень неравенства и ее отрицательную динамику. На средне- и долгосрочной перспективе они определяют качество и развитие человеческих ресурсов и перспективы экономики. В сфере инновационного развития, которое является основой любого экономического развития, авторы также выявили угрозы, а именно недостаточную эффективность использования ресурсов и отсутствие выраженной позитивной динамики.

Ключевые слова: экономическая безопасность, регион, инновации, стратегия, демография, распределение доходов, инновационное развитие

The influence of innovative development on economic security of the region

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Abstract. Fixed assets are an integral component of the productive capacity of any enterprise. The financial results of the enterprise largely depend on their intensity and efficiency of use. The analysis of fixed assets is usually carried out using an integrated and systematic approach, based on their availability, their movement, efficiency of use (including their active part). In the opinion of some authors, the traditional methods of analyzing fixed assets have a number of shortcomings, since they do not take into account the life cycle of an enterprise, the ecological aspects of the operation of fixed assets, the operation specifics of the individual divisions of a company and its branches. In order to improve the methodology for analyzing fixed assets, the authors proposed to use formalized and non-formalized criteria for analyzing the risks associated with the fixed asset use. A survey questionnaire was designed to determine the likelihood of the risk of economic losses associated with the use of fixed assets. The authors propose using the integral indicator for the purpose of analyzing the risk of using fixed assets in dynamics. In order to improve the procedure for auditing, the authors proposed segregation of economic transactions with fixed assets according to their cycles in accordance with the stage of their reproduction. Operational analysis is important for managing the efficiency of the fixed asset use, especially during a critical period. Using the analysis of the regularity in grain combines performance would reduce losses during harvesting, implement the work within strictly defined time frame and remunerate the employees for high-quality and intensive performance of their tasks.

Keywords: fixed assets, return on assets, equipment capability, fixed asset structure, fixed asset use risks, fixed asset performance regularity

Introduction

Analysis of the region from the standpoint of determining the level of its economic security requires the allocation of specific evaluation criteria and indicators, the thresholds of which (or the corridor of these thresholds) should be used for a comprehensive assessment of the state of the region, identifying threats and dangerous trends. The system of indicators to measure the economic security of the country has already been partly outlined. However, they view as a significant methodological problem to determine the economic security of the regions, which are differentiated in many ways in Russia. The economic security of the territorial entity may be considered provided under the following conditions:

1. Security employment in the region. The welfare state sets as its main goal the provision

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of a decent standard of living for its people, however, this goal can be most successfully achieved by providing the population with the opportunity to be engaged in active work in conditions that are safe for life and health.

2. Continuance of solvency. It should be noted that this implies not only the solvency of the region, that is, the observance of efficient proportions of its budget, but also the good financial condition of most commercial organizations, as well as the steady state of the banking system [5].

3. The correct intensity and direction of the cash flow in the regional economy, providing conditions for the stable development of business and living a normal life [2].

4. The innovative development is viewed as the basis of the long-term continuance of positive dynamics for both the economic and the social dimensions in present-day conditions [1].

The problem of the regional economic security assessment

In our opinion, a multi-criteria approach is needed. However it is necessary to use the projection on the regional level of the criteria of economic security of the Russian Federation indicated in the Strategy of economic security of the Russian Federation until 2030 as a systematizing criterion:

– quantum index of GDP;
– GDP per capita;
– share of Russian GDP in the world GDP (i.e. the place of national economy in the world);
– equity contribution in the fixed capital to GDP;
– degree of depreciation of fixed assets;
– index of industrial production;
– index of labor productivity;
– monetary aggregates (M2 money supply);
– inflation rate;
– internal public debt of the Russian Federation;
– external public debt of the Russian Federation;
– net capital import (export);
– level of economic cohesion of constituent territories of the Russian Federation;
– labour market tension ratio;
– GDP energy intensity;
– equity contribution in machinery, equipment and transport in the total volume of investments in the fixed capital;
– share of innovative goods, works, services in the total volume of shipped goods, works, services;
– share of high-tech and science-intensive products in GDP;
– the proportion of organizations providing technological innovations;
– budget deficit;
– the ratio of foreign exchange reserves of the Russian Federation to the volume of imports of services and wares;
– quantum index of exports and imports, as well as the export surplus;
– share of machinery, equipment and transport in the total volume of non-resource export and import;
– proportion of the working age population in the total population size;
– proportion of citizens with cash income below the level of the cost living;
– energy production and consumption balance;
– business confidence index of enterprises;
– share of imports in the volume of tradable resources of food products;
– retail turnover;
– distribution of employment in the economy by level of education;
– R/P;
– proportion of citizens with wages below the level of the cost living;
– crime rate in respect of economy, etc.

One of the possibilities for assessing the economic security of the region is the adaptation of the system of indicators given in the national strategy to the regional level, and their subsequent monitoring [3]. However not all the indicators mentioned above are available for such adaptation.

Thus, some indicators are missing in the state statistical reporting of the regional level. These include: proportion of citizens with wages below the level of the cost living (for the employed – the level of the cost living for the working-age population); the share of imports in the volume of food consumed in the region; business confidence index of enterprises; the share of individual groups of goods in the total volume of non-resource exports and imports (especially the so-called advanced refining goods: machinery, equipment and transport) and others.

We think that some of these indicators do not have a significant impact on economic security at the regional level, for example: quantum index of exports and imports, as well as the export surplus; energy intensity of GRP; net capital import (export); the debt of constituent territories of the Russian Federation and others.

This happens due to significant differences between the relations of states on the world arena and the relations of the regions within the country:

– within the country, it is possible to transfer all resilient types of resources between regions in order to achieve national goals, including conditions that differ from those dictated by the market;

– within the country, regions of different size are completely entitled to differ both in the scale of the economy and the degree of participation in ensuring national economic security, whereas a country of any size takes care of its own security;

– the proportion of the primary and non-resource economy is of a great importance for such a country as the Russian Federation, whereas for many regions, including the Voronezh region, this question is not in principle;

– on the contrary it is important to assess the degree of development of the leading sectors of the economy for each of the regions ensuring their economic security.

Finally, some of the indicators listed in the national strategy are incalculable for the regional level or do not make sense: the ratio of foreign exchange reserves of the Russian Federation to the volume of imports of services and wares; level of economic cohesion of constituent territories of the Russian Federation; monetary aggregates; inflation rate. They simply cannot be transferred to the regional level in nature [5].

Estimation of economic security level of Voronezh region

Thus, we believe it is possible to estimate the economic security for several groups of indicators:

1) the share attributable to the constituent territories of the Russian Federation in the total volume of the national economy;

2) the demographic situation;

3) the labor market situation and household income;

4) the degree of innovative development of the economy.

We start the analysis with the main economic indicators of the region, presented in Table 1, that affect its economic security level.

Table 1.

Main economic indicators of the development of the Voronezh region

Index	Year				
	2012	2013	2014	2015	2016
Gross regional product, mln. Rub.	563965,4	611720,4	717667,2	823133,6	-
Gross regional product in % by previous year	109,3	102,2	105,9	100,5	-
GRP per capita, Rub.	241947,4	262578,3	308004,7	352926,0	-
Fixed assets in the economy, mln. Rub.	1078383	1158136	1233526	1401937	1534644
Average annual number of employed in the economy, thous. people	1057,9	1057,0	1055,3	1092,5	1094,8
Volume of goods shipped to manufacturing industries, mln. Rub.	250018,9	258914,2	310682,4	396550,1	414143,5
Agricultural products, mln. Rub.	125546,8	143854,4	158944,7	201094,3	204262,6
Investments in fixed assets, billion Rub.	182,3	217,0	240,3	264,7	271,0
Freight highway transport, mln t-km	1548,0	1959,0	1954,0	2180,0	2932,0
Retail turnover, mln. RUB	324310,0	368595,7	422902,3	463696,3	487054,2
Consumer price index (December to December in % by previous year)	107,3	107,1	112,0	113,6	105,5

As we can see from the data in Table 1, the GRP index has fluctuated significantly in recent years, although it should be noted that during the period under review this indicator did not decline. However, these fluctuations are a consequence of national crisis phenomena, and not some particular disadvantage of the Voronezh region.

Fixed assets in the economy are steadily growing, as well as the volume of investments in fixed assets, providing a positive impact on the regional development and on the economic supply security of the region.

Both the retail trade turnover and the transport turnover have been growing at a significant pace as well as the production of processing and agriculture industries, which are considered to be the leading branches of the regional economy recognized as industrial-agrarian.

The only downside of the phenomenon to the economic security can be called the rather high level of consumer price index, which was at the highest level in 2014–2015 in particular, concerning the entire country.

To estimate the share attributable to the Voronezh region in the total volume of the national economy, we consider the indicators in table 2.

The data in Table 2 indicate that on a national scale, the Voronezh Region occupies a significant place only in the production of agricultural products, which logically follows from its location and climatic conditions.

It is logical to assume that the national government sees a significant role of this constituent entity of the Federation providing the food security, consequently the region can count on the maximum federal support concerning the agricultural sphere.

Table 2.

Scales of the Voronezh region as a subject of the Russian Federation

Index	Voronezh region		
	Value	In % of the entire RF	Rank among the constituent territories of the Russian Federation
Area, thousand km2	52,2	0,3	51
Population, thous.	2335,4	1,6	22
Gross regional product, mln. Rub.	823133,6	1,2	38
Agricultural products, mln. Rub.	204262,6	3,9	5
Production and distribution of electricity, gas and water, mln. Rub.	64230,8	1,2	26
Fixed assets in the economy, mln. Rub.	1534644	0,9	33

By area, the region is large enough for the central part of the country. It is worth mentioning that the largest entities in Russia located in the Urals. So, it is the largest and at the same time the most populated Central Black Earth region. In terms of population, the region can be recognized as a fairly large subject of the Russian Federation. There is also a high population density. Only Moscow and the Moscow Region have the larger population concerning the entire Central Federal District – the most populated part of Russia.

However, it is important to note that, according to the economic results of its activities, the region cannot be recognized as neither particularly large nor particularly effective. Thus, 1.6 % of the country's population, living in this region, create only 1.2 % of the country's GDP, which, of course, is primarily associated with the agrarian specialization of the region. In the Voronezh region, agriculture is on the third place in terms of the share in GRP. The region also produces 1.2 % of the national production of electricity, gas and water. Contrary only 0.9 % of national fixed assets are involved in the economy, and it is they who create this 1.2 % of GDP. Consequently, we can note the relatively inefficient use of labor resources, but the effective use of capital in the regional economy. In terms of economic security it highlights the need for close attention to the human potential of the region in order to find out ways to improve the efficiency of its economic use.

We consider the indicators presented in the dynamics in table 3 to assess the demographic situation in the Voronezh region.

Table 3.

Main demographic indicators of the Voronezh region

Index	Year				
	2012	2013	2014	2015	2016
Population at the end of the year, thous.	2330,4	2329,0	2331,1	2333,5	2335,4
The population of working age, thous.	1375,4	1358,6	1343,5	1325,5	1310,0
Demographic burden per 1,000 people of working age account for persons with unemployable age	694	714	735	761	783
Natural increase (decrease) of the population	-4,7	-4,8	-4,8	-4,2	-4,5
Working-age population mortality rate, per 100,000 inhabitants	573,8	576,3	597,7	559,8	537,2

Natural population decline, slightly reduced in scale, however, continues, which represents a significant threat, including economic, as citizens born sooner or later will come to an economic activity, forming a part of the employment potential of the region.

The declining and the rapid aging of the working age population has a negative impact on the labor market and the employment potential. However, in the positive side it should be pointed out that in the presented increase in the demographic load there is also a share formed by the load of children, i.e. persons younger than working age. However, this advantage can appear only on the strategic perspective. At the same time, even the observed increase in fertility caused by the actions of the state and regional support, increases the burden on the working citizens, while each of them has already accounted for almost 0.8 persons of unemployable age. Therefore, this factor can also be considered a significant threat.

The degree of realization of the constitutional right of citizens to work is the most important sign of the social development of a territory. The dynamics of unemployment in the Voronezh region are presented in table 4.

Table 4.

The main indicators of the number of labor resources and employment in the Voronezh region

Index	Year				
	2012	2013	2014	2015	2016
Human capital – total, thous. people	1420,3	1420,6	1419,7	1411,4	1390,7
Labour force participation rate, %	64,6	64,0	64,9	65,4	65,9
Unemployment rate, %	5,5	4,7	4,5	4,5	4,5
Recorded unemployment rate, %	1,1	1,0	1,0	1,1	1,0

Based on the data of table 4, one can indicate a stable level of unemployment in the Voronezh region, and stability is observed both by registered unemployment and determined by the ILO methodology. This phenomenon should be recognized as positive from the point of view of the economic security of the region, since its labour market seems to be in a certain equilibrium acceptable for the achieved level of economic development.

According to the analysis the state of differentiation of the population by income level in modern Russia is increasing. This index has negative development trends and imperfect optimization mechanisms. The average per capita monetary incomes of the population are not too different from the average monthly nominal wage, despite the existence and active use of various social benefits and their significant share (about 20 %) in the structure of the monetary incomes of the population. The population stratification indicators in the Voronezh Region are approximately at the average level for Russia, but at the same time they are gradually increasing.

The place of innovative development in the evaluation of the regional economic security

Finally, the safety and sustainability of the modern economic system is unthinkable without its development, and the latter – without innovation. The development of scientific and technical innovations in the form of high-tech and scince-intensive products that are competitive in the future represents the most difficult perspective from the standpoint of organizing the interaction of scientific organizations and the market through objects of innovative infrastructure. It should be noted that technologies for developing innovative ideas vary depending on the technological structure and type of innovation cycle.

Quantitative assessment of the regional innovation system on the basis of the statistical indicators available and provided by specialized state bodies is difficult. Nevertheless, we will present some statistical indicators recommended for use for its analysis:

1. The share of scientific, research organizations and design offices in the total number of enterprises and organizations in the region, %.

2. The share of employees of scientific and research organizations in the total employment in the region, as well as the share of researchers and researchers in the staff structure of such organizations themselves.

3. The shares of researchers with scientific degrees among employees of scientific organizations, including those directly involved in research, as well as the proportion of such persons among the population of the region as a whole.

4. The number of patents obtained for inventions and utility models based on those employed in research organizations and the economy as a whole.

5. The number of new technologies created in the region is total, as well as based on those employed in research organizations and the economy as a whole.

6. Total costs of research and development in % of GRP, per 1 employee, per 1 research organization and per 1 employee.

7. The share of innovative goods, works and services in the total volume of goods shipped, work performed, services, %.

8. The number and share of enterprises selling, procuring, applying new technologies, as well as providing assistance in their application, for example, information and consulting.

Evaluation of a regional innovation system is complicated by the lack of a unified point of view regarding the list of its constituent elements, and by the limited availability of data necessary for its full and comprehensive review. Nevertheless, we will consider some indicators of innovative development of the Voronezh region based on the data available on the website of the Federal State Statistics Service (Table 5).

Table 5.

Main indicators of innovation activity in the Voronezh region

Index	Year				
	2012	2013	2014	2015	2016
1	**2**	**3**	**4**	**5**	**6**
Number of organizations engaged in innovation activity, units	–	66	70	76	94
R & D expenses, mln. Rub.	–	7564,3	6769,7	9905,2	7729,3
Ratio of R & D expenditures in GRP, %	–	1,24	0,94	1,20	-
Shipped innovative products of own production, mln. Rub.	–	4715,5	8500,2	21107,7	4861,7
Number of organizations performing research and development, units	57	56	53	63	63

Continuation of table 5

1	2	3	4	5	6
The average size of one innovative organization, pers.	189	192	205	168	164
The number of developed advanced production technologies, units	9	59	31	25	26
The number of personnel engaged in research and development, people.	10799	10763	10865	10600	10334
Average costs per developed technology (capital intensity of development), mln. Rub.	2237,6	420,1	1168,8	1296,6	1225,0
The volume of scientific and technical work performed, mln. Rub	20138,8	24787,4	36232,0	32416,0	31849,3

We made a number of conclusions based on the proportions calculated according to table 5:

1. In the region, there is no pronounced growth trend in both R & D expenditures in monetary terms and their share in relation to GRP, which suggests the instability of innovative development and the lack of understanding of its importance among businessmen and officials. The value of the ratio of expenditures on R & D in GRP for the entire period remained low, although it exceeded the indicators of neighboring areas.

2. Not only is there no increase in the number of advanced developments, but also no positive trend in the average costs of one development in the region. It can be said that the costs in the innovation sphere practically do not correlate with the number of completed works. There is also no connection between indicators of development costs and their quantity with the volume of innovative products produced.

3. There are no pronounced trends in the number and size of innovative organizations. To some extent, this confirms the well-known in the scientific world view that the effectiveness and viability of an innovative organization has practically nothing to do with its size.

Conclusion

Thus, relying on the methodology of the study of the economic security of the region, based on indicators introduced to monitor the level of the national economic security within the framework of the Economic Security Strategy of the Russian Federation until 2030 the main threats to such security of the Voronezh Region are the following:

– in the sphere of formation and distribution of incomes of the population, determining the future state and development of the labor potential of the region;

– in the field of innovation development, which is the basis of any economic development in the modern world in general, as well as practically the only source of competitive advantages.

Thus, the disadvantages of innovative activity in the Voronezh region should be recognized as a significant threat to the economic security of the region, which may emerge in the near future in a rapidly evolving technology of the modern world.

Repeatedly carried out for different sets of indicators assessments of our region in terms of its economic security as a whole give grounds for positive conclusions. However, the issue of a more active innovative development of the region is quite acute. If the situation of the least satisfactory areas of innovation, especially – its effectiveness and engagement in the human potential is not corrected, the region could lose its favorable positions on many other issues concerning its development in the near future.

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