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**SMALL INNOVATIVE ENTERPRISES AS THE DRIVING FORCE
FOR DEVELOPMENT AND REGIONAL IMPLEMENTATION**

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Abstract

This article explores the level of development and innovation implementation in Russia and the country's position in the rating Global Innovation Index 2018. Terms and conditions, defining the value of the Global Innovation index, as the main criterion for innovative development of the State's economy, were explored. The dynamic of the main qualitative and quantitative criteria, contributing to the low value of the Global Innovation index of Russian economy in previous years, was analysed. The existing problems, hampering the development of innovative potential of Russian economy on macro-, meso- and micro-levels, were identified and considered. The issue of targets, relating the implementation of the State programme "Economic development and innovation economy" in the sphere of innovation for 2018 and planned 2019-2020 years, was addressed. The growth rate of intramural research and development costs was estimated, and financial support for innovations in terms of their formation sources was studied. There is also a comparative analysis of expenditures on technological innovations in small enterprises and its proportion of total number of small enterprises, which were researched during 2009-2017, growth rate of obtained patents for inventions, useful models, industrial designs in Russia, Northern Caucasus federal area and the Kabardino-Balkar Republic. The performance of small enterprises, which were established by Kabardino-Balkarian State University named after H.M.Berbekov, was explored. The study has identified possible measures to be taken to address the revealed problem of innovative potential implementation in Russian economy and improve level of development and introduction of innovations on macro- and meso-levels.

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Keywords: Innovations, small innovative enterprises, regional economy.



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1. Introduction

The improvement in innovativeness of world's economy is the main trend of contemporary economy development stage, with the continuing growth of information and communication technologies, increasing role of innovation in economic development of countries, "intellectualization" of business sphere, expansion of non-economic sectors, commercialization of scientific conceptions and designs, widespread integration of innovations in all sectors of the economy and human activity. Innovative companies, especially, small innovative enterprises (below – SIE) has the leading role of the ensuring the domestic economy development in innovative type, which will provide its accelerated growth. According to the study "Global innovation Index 2018", published in July, 2018, where the leading western scientists had examined 126 countries by 80 indexes, characterizing their innovative development, Russia occupied 46th position in 2017, moving one step downwards, compared with 2016, and three positions down - compared with 2015 (Dutta, Lanvin, & Wunsch-Vincent, 2018).

Russian low global innovation Index rate is linked to a number of issues, preventing the realization of the country's innovative potential, which is particularly acute in a regional level. A considerable amount of entities in Russian Federation have lower levels of innovative development than developed countries' performance, and even the national average. This increases their financial dependence on federal budget, disables investment climate, hinders the growth of entrepreneurial activity, especially, innovative. So, formulation of methods of overcoming those problems is highly relevant (Alikaeva, 2018).

In order to develop and implicate innovation in Russia the Government of the Russian Federation has adopted the decision No 316 of 15 April 2014, which instituted the State program "Economic development and innovation economy", amended by the Act of 19 September 2018. This program contains the main targets relating work on this aspect. The program "Fostering innovation", the part of the above-mentioned State program, pursue following targets in 2018-2020: growth of innovative activity of enterprises, improvements in the efficiency of investment management in innovations and researches, the implementation of the regional programme aimed fostering of territorial clustering innovating, creating a network of territorial industrial clusters to fulfil competitive potential of territories. (Government, 2014a; Government, 2014b; Government, 2014c)

2. Problem Statement

To pursue the outlined above targets of the program "Fostering innovation", from our point of view, the analysis of indicator for innovations development and implementation on macro-, meso- and micro-levels is required. That will identify the existing problems, hampering the innovative potential of realization and implementation of innovations in the region.

3. Research Questions

According to the stated problem there are several objectives of the study: to analyze the dynamic of the main qualitative and quantitative criteria, contributing to the value of the Global Innovation index of Russia, to evaluate the activities of SIE on macro-, meso- and micro-levels, to explore existing problems of innovative potential realisation within the specific macro-region – Northern Caucasus federal area (below – NCFA), a member of the Russian Federation, forming part of this federal area – the Kabardino-

Balkar Republic (below the KBR), and one of the leading universities of the region, engaging in intensive innovative activity and establishing more than 30 SIE – Kabardino-Balkarian State University named after H.M.Berbekov (below – KBSU), to propose measures to overcome identified problems and to develop measures to stimulate development and implication of innovations in the region.

4. Purpose of the Study

The purposes of the study are the analysis of existing problems in realization of innovative potential of Russian economy on macro-, meso-, and micro-levels, and the development of measures to stimulate development and implication of innovations in the region.

5. Research Methods

The study is based on methods of statistic, comparative and abstract logical analysis application, and simulation, formalization, inductive and deductive, logical. All these methods were used through a systemic approach.

6. Findings

Absolute amount of investments in scientific research and developments (below – investments in R&D) is considered as one of the most important quantitative indicators of development and implication of innovations rate. By the results of Higher School of Economics research, on this criterion Russia had occupied 10th place in 2016 with funding of 37.3 trillion US dollars in purchasing power parity (Ratai, 2017). The amount of investments in R&D in Russia is lagged behind not only the countries recognized as a world leader of innovative business development – the USA (the 1st place: 502.9 trillion dollars), China (the 2nd place: 408.8 trillion dollar) and Japan (the 3d place; 170.0 trillion dollars), whose actual expenditures on innovations many times higher than those in our country – but also such States, as India, the Great Britain and Brazil, outpaced Russia on this rate on 35%, 24% and 3% respectively (New Sources of Growth, 2018).

An important role in definition of Global innovation Index has another quantitative indicator – the proportion of domestic expenditures on R&D in GDP of the State. Current proportion of domestic expenditures on researches and development in GDP of Russia, defined as actual costs of research and development performances per States territory, financed by all funds to GDP in current prices, according to the official data is only 1.11%, which brings Russia only on 35th place in overall rating, without even hitting top 10 of leaders (Federal State Statistics Service, 2018). Though Russia leads in innovation development of only 30% of key technological spheres, the majority of elaborated techniques and inventions are not implemented in large industries, commercial demand has only 16% of these innovations, and less than a half of them are into consideration of the world market (Government, 2013). Low domestic cost on R&D in GDP can be considered as characteristic of Russian economy, because for the period from 2005 to 2017 its level hadn't become higher 1.25% - maximum rate of the proportion of real expenditures on R&D in GDP of the State, which was in 2009 (Federal State Statistics Service, 2018)

Two factors influenced on formation of the proportion of real expenditures – GDP growth rate and the proportion of real expenditures on R&D growth rate, defined in current price; comparison between the

performance dynamic and inflation rate in Russian Federation during the same period, allows evaluating their growth excluding price increases (Figure 1).

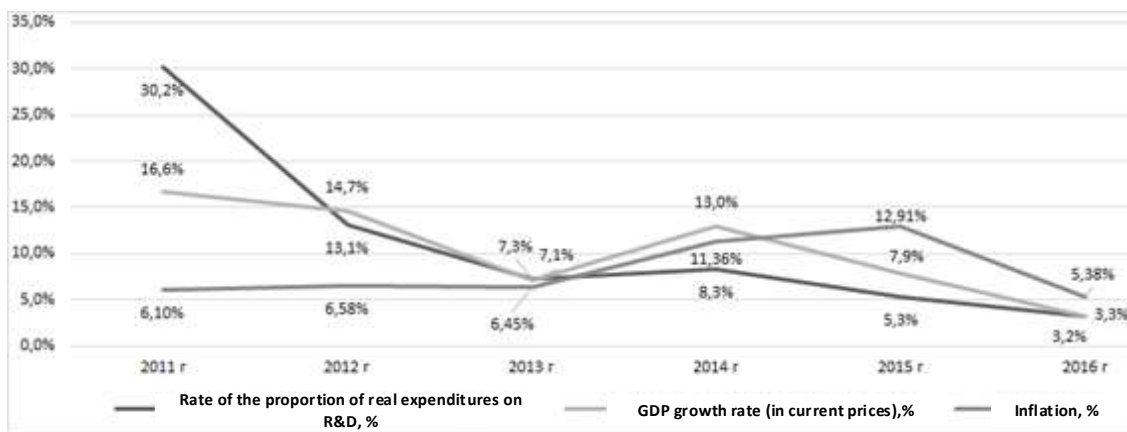


Figure 01. Rate of the proportion of real expenditures on R&D, GDP (in current prices) and Inflation rate, %

Thus, according to the data from Figure 1, maximum rate of the proportion of real expenditures on R&D occurred in 2011 and was 30.2%, significantly ahead by amplitude of GDP growth rate, which had changed on 16.6%, and price factor had insignificantly changed. However, such incredible growth had not been demonstrated by any rate ever again. In 2016 the lowest inflation rate had occurred – only 3.3%, but rate of the proportion of real expenditures on R&D and GDP growth rate were minimal – 5.38% and 3.2% respectively.

Significant inflation rate growth in 2014 and 2015, caused by unfavourable condition in commodity markets, weakness of the national currency, the imposition of economic sanctions against Russia by foreign States, almost levelling the effect of GDP rate growth and investments in R&D, however the largest slowdown of last rate was experienced in 2015. This was connected with the withdrawal of foreign investments, increase in the cost of borrowings and increased the economic risk, which made the investment level of domestic entrepreneurship lower.

In general, despite the positive momentum in rate of the proportion of real expenditures on R&D in analysed period, the conclusion about the lack of innovations investment in Russian economy can be made. Thus, investments in R&D of China during the same period were increased by more than 71%, which lifted their place in “Global innovation Index 2018” from 22 place up to 17, and by the several qualitative and the quantitative sub-indexes brings China into the top three of countries-leader. (Dutta, Lanvin, & Wunsch-Vincent, 2018; Vlasova, 2018).

Table 01. The structure of recourses funding of domestic expenditure on R&D (Government of the Russian Federation, 2014a)

Years	Regional and local budgets	Federal budget	Organization budget	Public-sector institutions budget	Business-sector organizations budget	Other sources
2013	1.6%	61.3%	8.2%	7.2%	15.4%	6.4%
2014	1.3%	61.3%	8.6%	8.8%	15.2%	4.9%
2015	1.3%	62.3%	9.6%	8.0%	14.9%	4.0%
2016	2.3%	57.0%	12.1%	9.3%	15.5%	3.9%
2017	1.7%	58.1%	14.0%	7.4%	15.1%	3.7%

As data from the Table 01 illustrate, federal budget is the major part of investments on innovations, but the proportion of federal budgets means during analysing period had lowered by 3.2%, and its maximum rate was in 2015, when the government of Russian Federation had taken extensive measures to compensate the outward investment in R&D. Decrease in this rate by 5.3% in 2016 is explained by underweighting from federal budget, because the situation in this sphere had been partly improved, inflation had slowed down, and R&D had turned into an enabling environment that would attract other funds.

Next part of investments in innovations is for business-sector organizations budget, whose rate is relatively stable and during the period under review had fluctuated in tenth of a percentage point, and was in 2017 – 15.1%. An important tendency in the evolution of this indicator must be noted – when the innovation investments grow through other sources, business-sector organizations increases their financial participation in this sector, when the innovation investments decrease – means of organization outflowed and their expenditures in R&D reduces.

The proportion of funds of organizations was increased during 2013-2017. Measures were rising by 5.8% over this time and compensated the diversion of means from other funds. This represents their increased interest in innovative development their business.

Public-sector institutions budget is rather stabile and were 7.4% in 2017, and was almost unchanged compared with the level in 2013. The main problem of increasing investment through this source was the inflexibility in financial strategy of organizations, connected with the poor governance of these structures, their insolvency in decision-making about management of available resource.

The proportion of other fund last year was only 3.7 and had not significantly impacted on overall trend in movement of the rate of R&D expenditures. The rate of investments through regional and local budgets leads to the same conclusion. It should be noted, that, notwithstanding, the level of financial resources availability in consolidated budgets of Russian regions significantly differs, and the members of Russian Federation are highly polarized on the level of their socio-economic development, regional and local authorities in regions have shown no regard in innovation growth, lack of investment in lower-ranking budgets could not fully explain the extremely low level of the rate, which in 2017 was just 1,7%.

In spite of significant slippage in quantitative parameters, defined in the calculation of Global Innovation index of countries, Russia was able to obtain higher position in innovation quality ratings through the growth of efficiency in activity of Russian Universities, and also through improvement of scientific publications quality in Russia, its quote index in international scientific database, high level of

activity indicators not only of leading Russian Universities, higher education and research centres, but also in local Universities. The indicator of innovations quality in Russia was slightly reduced because of low index of posted on international market of Russian inventions, small number of requests for patent in the Patent Cooperation Treaty (PCT). The number of applications received from Russia in 2016 was 1,1 thousand, from USA – 56.5 thousands, from China – 48,9 thousands, from Germany – 19.0 thousands.

The number of applications in PCT received from Russia is low; there are registrations of patents systems in Russia, where domestic researchers and software developers send their applications. Thus, in 2017 21037 patents were granted for inventions, 8376 patents were granted for useful models, and 2194 – industrial designs. So, the main problem of improvement of this rate of innovative development of Russian economy is obtaining patents from international Patent Systems, providing the access of foreign commercial structures to implication of Russian innovations, which would let the domestic companies to increase innovation funding by the means of foreign venture capital (Government, 2014c).

The adoption in 2009 of the law No 217-FL “On amending certain legislative acts of the Russian Federation on the issue of business companies creation by budgetary scientific and educational institutions in order to implement (adopt) on practise the intellectual production”(below – 217-FL) has created the legal framework for Small Innovative Enterprises establishment. Their main distinctions from the other types of enterprises are the formation of charter capital order and structure, and purposes for which the organization was established. There should necessarily be a budgetary scientific institution or established by national (State) academy of sciences science agency, whose share in the authorized capital of established innovative firm should not be less than 25% (for joint-stock companies) and 33.3% (for societies with restricted liability), and their share in the authorized capital could be made by rights of using the results of intellectual activity, belonging to these agencies are domiciled.

The main purpose of SIE establishment is the commercialization of the results of intellectual activities – software, databases, inventions, scientific researches, whose exclusive rights will belongs to scientific institutions – founders (Barangov & Elzataeva, 2012).

Indicated problems and tendencies of innovation development in Russia characterize the level of the state’s economy innovativeness in general, but, because of geographical extension and uneven levels of social and economic development of its regions, the main hardships in the realization of innovative potential of the economy appears on the local level. So, comparative analysis of SIE activity in Russian Federation, NCFA and KBR seems to be appropriate.

The indexes, describing the influence on innovative development of the economy of SIE, are domestic expenditures on R&D, expenditure on technological innovation of small enterprises, the share of small enterprises, realizing the technological innovations in the total rate of explored small enterprises, the number of patents, granted for inventions, which dynamic is depicted in the Table 02 (Sukhinov & Ugnich, 2017).

Table 02. Indexes, describing the influence on innovative development of the economy of SIE

Index	Economic entities	2009	2011	2013	2015	2017
Domestic expenditures on R&D, million, RUR	RF	610426.7	699869.8	847527.0	943815.2	1019152.4
	NCFA	2639.8	4017.7	3695.5	4291.9	4609.0
	KBR	436.2	484.6	552.9	489.5	654.5
Expenditure on technological innovation of small enterprises, million, RUR	RF	6793.5	9479.3	13510.5	12151.8	19220.4
	NCFA	140.4	110.9	63.4	16.4	320.4
	KBR	38.3	30	-	0.1	188.4
The share of small enterprises, realizing the technological innovations in the total rate of explored small enterprises, %	RF	4.1	5.1	4.8	4.5	5.2
	NCFA	2.5	3.5	2.4	1.1	2.9
	KBR	5	1.3	-	0.7	10.2
Number of patents, granted for inventions, which dynamic, number	RF	26294	20339	21378	22560	21037
	NCFA	690	1176	581	621	468
	KBR	71	91	116	73	62

As we can see from the Table 02, domestic expenditures on R&D in NCFA and KBR in studied period of time, as well as all-Russia index, significantly growth, having reached the highest point in 2017, and was 4609.0 million RUR and 654.5 million RUR on the federal area and the region respectively. (Federal Statistics Service, 2018). It should be noted that the growth rate of NCFA are ahead of the growth rate in Russia (on 7.6% in general) and lag behind the growth rate of KBR (17%), and the growth rate of KR are lagging behind (on 17%).

The index of expenditure on technological innovation of small enterprises had been most significantly increased during the analysed period from 38.3 million RUR in 2009 to 188.4 million RUR by the end of 2017, that is in 3,9 times. In NCFA the growth rate are lower, because of the KBR growth rate. In RF expenditure on technological innovation of small enterprises had been almost tripled, which is considered as the positive tendency, as technological innovation specifically had the most financial return. KSR is the leader in the share of small enterprises, realizing the technological innovations in the total rate of explored small enterprises, which index in 2017 was more than 10%, meanwhile in RF and NCFA this index is 5.2% and 2.9 respectively. Exclusion of the influence of the KBR rate could lead to the conclusion about low level of investments in technological innovation in other regions, forming NCFA, even in such regions as Dagestan and Stavropol region. There was the main part of intramural expenditures on R&D within the explored area (Federal Statistics Service, 2018). This conclusion is also supported by the index of inventive effectiveness, calculated as the number of granted patents per 10 thousand residents. Thus, its meaning in 2017 in RF was equal 1.4, in NCFA – 0.5, in KBR – 0.7 of granted patents per 10 thousand

residents. Significant slippage in this index from national average level confirms the previous conclusion concerning the incomplete realization of innovative potential of Russian regions. But the innovation development is the very mean which levels the imbalance in social and economic development of regions, because even the members of RF with the low resource base, who don't have large industries on its territories, can provide an accelerated development of regional economics and reduced their dependence on federal budget transfers.

Higher School and research institutes, located in the region, are supposed to play the key role in this regard. It must be stated that the development level of KBR are heavily influenced by KBSU, due to the great scientific potential and high human resources training, and also due to innovative activity of the KBSU. This conclusion is evidenced by high levels scientific researches, conducted by the KBSU staff. Thus, in estimation and evaluation base of RSCI (Russian Scientific Citation Index), as at October 2018, were posted about 5 thousands of KBSU staff publications, 7.7% of them included in the database RSCI, 4.1% included in the databases Web of Science or Scopus, with the citation Index in the core of RSCI more than 500.

KBSU has the developed innovative structure, encompassing units of two types: 1) Innovative (research and development and technological constructing Institute "Harmony", Center of technological constructing informatics and Republican Information technology center); 2) Innovative start-up (Business Incubator "Start", Kabardino-Balkar regional center of Technology Transfer, Medical-Biological center situated Elbrus training and research complex of KBSU, telemedicine applications office, Scientific - Production Complex "Botanic Garden", laboratory "Implementation", SIE, established with KBSU support).

KBSU established 32 SIE over the period from 2010 to 2017, while KBR and NCFA established 32 and 82 similar enterprises respectively. SIE, established with KBSU support, are also very active in patent applications. In 2017 they were granted with 36 patents for inventions and 25 for computer-based programs, that is 58% from total amount of patent in KBR and 7.7% from NCFA. Despite intense inventive activity of explored enterprises, the level of funding and commercialization of research results is not high. So these enterprises had got funding through the involvement of grants from Foundation to promote innovation of 3.7 million RUR in 2015, 1,0 million RUR – in 2016, 2.0 million RUR in 2017, which is less than 0.5% from the total investment amount in the region over the relevant period (Malkanduev, 2017).

The lack of external financing and absence of in-house recourses for the investment constrained innovative activity of firms under study, which have, as the results of their innovative activity shows, high innovative potential. Training-scientific innovation complexes of KBSU are the most forward-looking in terms of creation on their base innovation-investment system, and SIE themselves, established by the University, might provide the acceleration for development and implementation of innovations in the region.

7. Conclusion

The analysis revealed the following issues in the realization of innovative potential of Russian economy:

1. insufficient funding of intramural expenditures on R&D on macro- and meso-levels, its slow growth rate, levels by the inflation rate; reduction of the real level of investments in R&D, in specificities on the regional level;
2. low proportion of real expenditures on R&D in GDP of the country, absence in strategic plans of innovative development of the country the activity, aimed to improve it;
3. low rate of bringing to international markets of Russian innovations, small amount of patent applications in the international patent system PCT, low index of commercialization of innovative developments;
4. minor costs level on technological innovations under extreme technical obsolescence and wear and tear of basic enterprises funds;
5. low interest showed by local regional authorities in innovation implementation and extreme small amount of investments into innovative projects from regional and local budgets, which is common for the whole country; almost total lack of sources for investment of innovations in subsidized regions, this prevents the obtaining means from federal budget to participate in programs providing co-financing investments into innovations from the regional budget;
6. disincentives of entrepreneurial sector in investments and innovative business development due to the high risks involved and lack of funding from other sources; in many regions with the low rate of social and economic development the enterprise sector is underdeveloped, and entrepreneurship has small financial resources, which is relevant for NCFI in general and for KBR;
7. the reduction in the provision of funding from the State budget on R&D, which provide following diversion of funds from this sphere;
8. inefficient management of innovation structure in the region, standing idle of competitive firms because of insufficient financing for full realization of investment projects, low quality and underdevelopments of business-plans on innovative enterprises, guiding policy-makers to innovation process instead of ensuring the commercial success of applications.

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