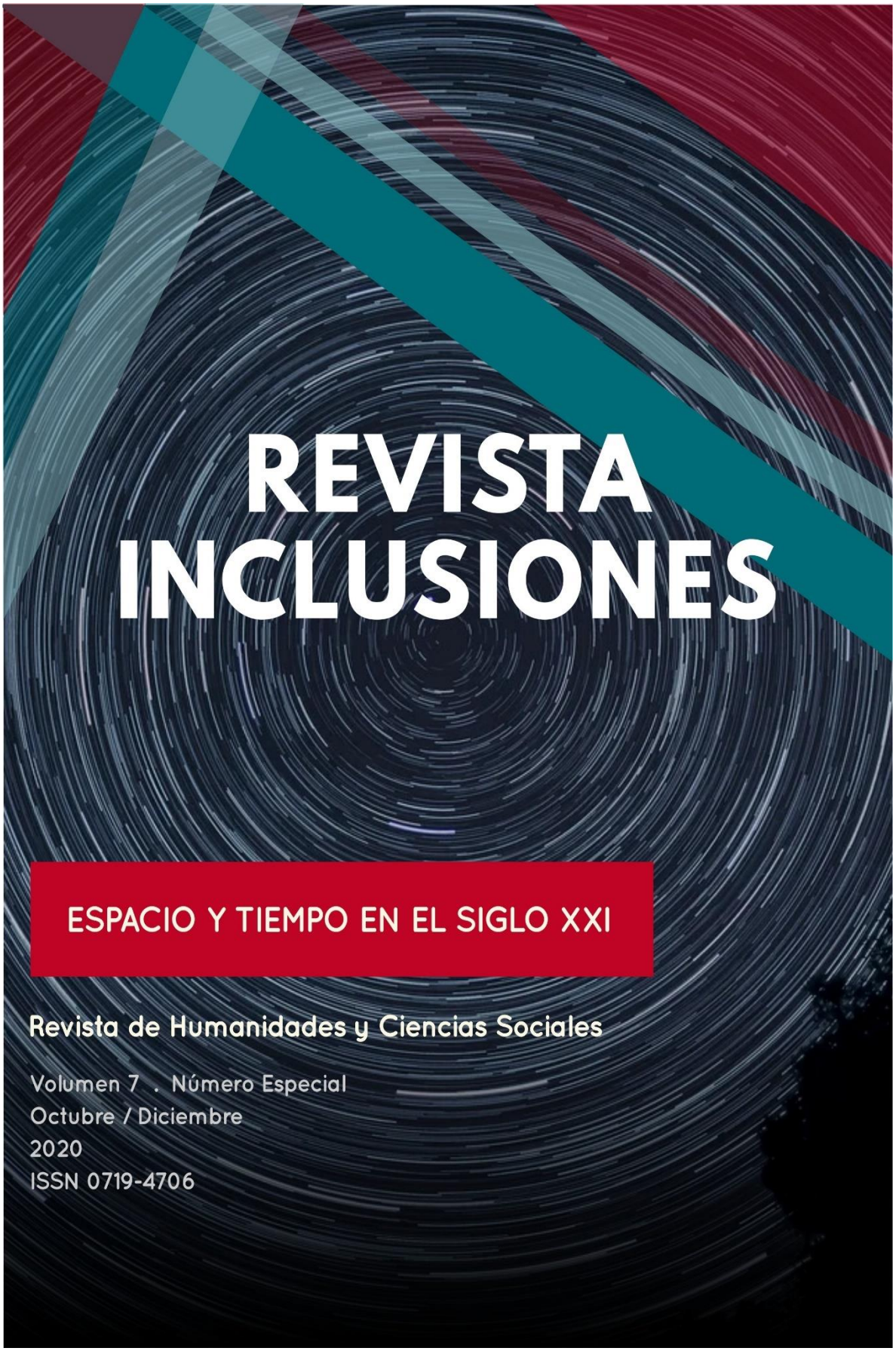

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IMPACT OF SMALL BUSINESS INNOVATION ACTIVITY ON REGIONAL ECONOMIC GROWTH IN RUSSIA

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Abstract

The paper deals with studying how small business and its innovative activity actually affect the volume of the regional economy and its growth in modern Russian reality. Statistical information such as indices and indicators of economy state and development in the regions of the Russian Federation for 2011-2018 was used for assessment. It is safe to conclude that the level of gross regional product is most influenced by the expenditures on research and development; the volume of sales of innovative goods, works, services, turnover of small enterprises; the share of small enterprises that implemented technological innovations; the cost of technological innovations of small enterprises. The efficiency of regional economy depends on the total efficiency of all its economic entities. It is important to ensure the productivity of small businesses and their contribution to the gross regional product in relative terms at a level not lower than that of the average or the large businesses.

Keywords

Economic development – Gross regional product – Small business – Innovation

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Introduction

The most important manifestation of the modern economic system transformation is the growing importance of innovation. Innovation process as a complex concept covers the areas of improving the technological foundations of production, the release of new products, as well as management methods. The concept of entrepreneurship as "implementing a new combination" formed by J. A. Schumpeter[1] continues to be the basis of many modern studies of innovation processes, for example, by L. N. Ogoleva, V. M. Radikovsky[2], P. Mohnen, M. Polder, G. van Leeuwen[3], O. T. Astanakulov, N.V. Kuchkovskaya, P.S. Bataeva, N. I. Khokhlova, and M. Calesci[4], A.V. Nikitin, N.Yu. Kuzicheva[5] and others. At the same time, the statement of some questions on certain components of his theory is not denied. For example, J. E. Stiglitz[6], discussing the prospects for the development of the innovation economy, suggested that potential competition could not prove an incentive to innovation, investment in innovation depended on the knowledge and ability of companies to innovate.

Investment is of key importance in innovation. A. N. Link, Ch. J. Ruhm, and D. S. Siegel[7] evaluated the impact of investment on innovation and economic growth and proved that both public and private investments were key to innovation. J. Benhabib, J. Perla, and Ch. Tonetti[8], studying the interaction of innovation and technology diffusion, confirmed the ability of innovation to stimulate long-term economic growth. Investments in capital, and accelerated development and commercialization of scientific technologies contribute to economic growth. Similar conclusions are reached by L. Foster, Ch. Grim, J. C. Haltiwanger, and Z. Wolf, who believe that the dynamics of basic industry innovations are an important driver of development and large variances in labour productivity.

The current view on the driving forces of economic processes is often that they are potentially dependent on institutions broadly defined as government regulation and the activities of business entities, and are therefore determined by economic cycles, macroeconomic policies, and internal incentives for self-development. The shift in the focus of academic research towards institutions has been driven by the emergence of new, broader and more accessible information for thinking about innovation and economic growth based on flows, comparison and bidding.

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[1] J. A. Schumpeter, Theorie der Wirtschaftlichen Entwicklung (Leipzig: Dunker& Humblot, 1912).

[2] L. N. Ogoleva y V. M. Radikovsky, “Increasing innovation activity of enterprises”, Economic analysis: theory and practice Vol: 7 (2008): 2-8.

[3] P. Mohnen; M. Polder y G. van Leeuwen, “ICT, R&D and Organizational Innovation: Exploring Complementarities in Investment and Production”, NBER Working Paper No. 25044 (2018).

[4] O. T. Astanakulov; N. V. Kuchkovskaya; P. S. Bataeva; N. I. Khokhlova and M. Calesci, “Providing Innovative Processes in the Economic Development of the Russian Regions”, India: Space and Culture. Vol 7 num 2(2019).

[5] A. V. Nikitin y N. Yu. Kuzicheva, “Innovative Technologies in Agriculture”, International Journal of Recent Technology and Engineering Vol: 8 num 4 (2019).

[6] J. E. Stiglitz, “Intellectual Property Rights, the Pool of Knowledge, and Innovation”, NBER Working Paper No. 20014 (2014).

[7] A. N. Link; C. J. Ruhm y D. S. Siegel, „Private Equity and the Innovation Strategies of Entrepreneurial Firms: Empirical Evidence from the Small Business Innovation Research Program”, NBER Working Paper. Vol. 18297 (2012).

[8] J. Benhabib; J. Perla y Ch. Tonetti, “Reconciling Models of Diffusion and Innovation: A Theory of the Productivity Distribution and Technology Frontier”, NBER Working Paper No. 23095(2015).

S. Ardagna, A. Lusardi[9] examine the factors affecting individual decisions to engage in new business activities and consider such types of regulation as the regulation of the commodity and labor markets and the enforcement of contracts. As a result, it is concluded that regulation may facilitate or hinder business activity, depending on the regulatory aspect.

A significant layer is occupied by research on the quantitative impact of business density on economic development and growth indicators. This issue is discussed in the work of L. Klapper, R. Feat, M. F. Guillén[10], which analyses such components of the institutional environment as the quality of the regulatory environment, the availability of finance, and the prevalence of informality. They make the conclusion about the harmful influence of business regulation. Similar conclusions are drawn by S. Ardagna and A. Lusardi[9] when assessing the impact of the regulatory and legal environment on the speed at which new businesses are created.

Formally, the relationship between economic growth and business size is described by the Gibrat's law[11]. In his work "Les Inegalites Economiques", R. Gibrat obtained a logarithmically normal distribution of companies by size and growth rate and formulated the thesis that the company size follows the random walk and the growth rates are independent of it.

However, in the modern view, small business is often considered as an engine of economic growth, an important factor that implements entrepreneurial activity and employment of the population. For example, D. Neumark, B. Wall, and J. Zhang[12] have shown that it is important for small businesses to create additional jobs, and that small firms can grow faster than larger ones. A.T. Young, M.J. Higgins, D.J. Lacombe, and B. Sell[13] believe that small businesses are innovative engines of Schumpeterian growth. A similar point of view is held by E.A. Tolmachev [14], E.A. Mazilov and A.E. Cremin[15] arguing that small business has significant impact on socio-economic development and creates prerequisites for accelerated economic growth.

Economic arguments for the importance of contributing to the total volume of innovation and growth are the basis for the development of various small business subsidy programs, which is noted in the studies by C. Lelarge, D. Sraer, D. Thesmar[16], J. E.

[9] S. Ardagna y A. Lusardi, Entrepreneurship and Firm Formation across Countries. International Differences in Entrepreneurship. University of Chicago Press. 2010. 17-62.
[10] L. Klapper; R. Amit y M. F. Guillén, Entrepreneurship and Firm Formation across Countries. International Differences in Entrepreneurship (Chicago: University of Chicago Press, 2010).
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[15] E. A. Mazilov y A. E. Cremin, "Assessment of the impact of small business in socio-economic development of regions", Territorial development Issues Vol: 1 num 41 (2018): 1-8.
[16] C. Lelarge; D. Sraer y D. Thesmar, Entrepreneurship and Firm Formation across Countries. International Differences in Entrepreneurship (Chicago: University of Chicago Press, 2010).

Stiglitz, E. V. Zaverza[17] and others. From an empirical point of view, this logical construction as a whole is not in doubt. However, each economic system has its own characteristics of certain processes, which are determined by a variety of endogenous factors. This requires further objective assessment of the impact of small business innovation activity on regional economic growth in order to form an efficient mechanism for its regulation and formation of sustainable economic development.

Material and methods.

This article is aimed at studying how small business and its innovative activity actually affect the volume of the regional economy and its growth in modern Russian reality.

The necessary system of interconnected measures was used to assess economic development. These measures included relevant statistical information in the form of indices and indicators of the economy state and development in the regions of the Russian Federation for 2011-2018. The research was based on statistical and analytical materials of the Federal State Statistics Service of the Russian Federation, materials of academic research, scientific conferences and periodicals.

The methodological basis of the research was based on fundamental principles, categorical apparatus of the theories of innovative and regional economy, conceptual and structural approaches to the description of regional innovation infrastructure, its elements, the development theory and the regional innovation system. The methods used included systematic approach, elements of comparative and statistical analysis that allowed justifying and arguing the main conclusions and results of the study.

Results.

The main macroeconomic indicator at the regional level is the gross regional product (GRP), which characterizes the process of production of goods and services for final use. In order to assess the state of economic development of the regions of the Russian Federation, the data of dynamic statistics for the period 2011-2018 were analysed (Table 1).

Indicators	2011	2012	2013	2014	2015	2016	2017	2018
GRP, RUB tln	453,923	49,926.1	54,103.0	59,188.3	65,750.6	69,237.7	74,926.8	85,117.92
Index of physical volume of GRP,%	x	103.1	101.8	101.3	99.4	100.8	101.8	102.3
Internal expenditures on research and development, RUB bln	610.4	699.9	749.8	847.5	914.7	943.8	1,019.2	1,028.2

[17] E. V. Zaverza, Development of small innovative entrepreneurship in the regions of Russia. IOP Conf. Ser.: Earth Environ. 2019.

Volume of innovative goods, works, and services, RUB bln	2,106.7	2,872.9	3,507.9	3,579.9	3,843.4	4,364.3	4,167.0	4,516.3
Share of organizations that implemented technological, organizational, and marketing innovations, %	10.4	10.3	10.1	9.9	9.3	8.4	8.5	8.6

[1] - Source: Compiled by the authors according to Rosstat (http://www.gks.ru/)
[2] – *Preliminary data*

Table 1
Economic development and innovative activity of the regions in the Russian Federation[1]

The analysis shows that the studied regions as a whole have positive dynamics aimed at increasing the studied indicators. The total GRP for the Russian Federation as a whole increased by 65% since 2011. The highest growth rate of the physical volume of GRP of the Russian Federation was achieved in 2012 – 103.1%. Within the following years, economic growth was gradually slowing down and its lowest level was obtained in 2015 – 99.4%. The level of internal expenditures on research and development increased by 68% during this period, and the volume of innovative goods, works, and services increased by more than twice. Negative dynamics were demonstrated by the indicator characterizing the share of organizations that implemented technological, organizational, and marketing innovations. During this time, it decreased to 8.5%.

Despite the overall favourable situation, different regions, due to their economic characteristics and initial development potential, demonstrate different rates of growth and innovation activity. The leading regions in terms of GRP in relation to other regions under study are the Tyumen region, the Moscow region, Moscow, and Saint Petersburg, followed by the Krasnodar territory and the Republic of Tatarstan. The Republic of Kalmykia, as well as the Astrakhan region and the Yamalo-Nenets Autonomous district are leading in terms of growth rates. The average growth rate has been more than 200% since 2011.

It is customary to refer to the internal expenditures on research and development the actual costs expressed in monetary form for the implementation of research and development in Russia, regardless of the source of funding. In absolute terms, the first place regarding research and development expenditures is also taken by Moscow, Saint Petersburg and the Moscow region; however, the Tula region, the Krasnoyarsk territory and the Yamalo-Nenets Autonomous district are leading in terms of their growth rates.

The volume of innovative goods, works, and services produced in the Russian Federation also has a positive trend, which corresponds to the total volume of shipped goods, completed works and services. The dynamic statistics data show that Moscow, St. Petersburg and the Moscow region are leading in the net amount of produced innovative goods, works, services, and growth rates, as well as in the share of innovative products in total volume of shipped goods.

The noted regional features do not allow formulating an unambiguous judgment about the relationship and degree of dependence of the studied indicators. To identify the impact of research and development expenditures, the volume of innovative products, and the level of innovation activity of enterprises on the GRP, and to determine the closeness of the relationship between these indicators, a multiple correlation and regression analysis was conducted (Table 2).

Regression statistics			Coefficients	Standard error	t-statistics
Multiple R	0.894	Y-overlapping	490,872.79	190,802.98	2.57
R-squared	0.799	Level of internal research and development expenditures, RUB bln	32.06	4.13	7.76
Adjusted R-squared	0.792	Volume of innovative goods, works, and services, RUB bln	3.43	1.68	2.04
Standard error	75,4487.553	Share of organizations that implemented technological, organizational, and marketing innovations,%	-19,021.42	21,073.12	-0.90
Observations	85	x	x	x	x

Table 2

Results of analysis of the influence of innovation activity factors in regions on the GRP

The calculated coefficients of pair correlation between the mean values of the studied indicators indicate a significant (according to the Cheddock's scale) relationship between them. Pearson's multiple (aggregate) linear correlation coefficients for four variables allow drawing up an equation describing the dependence of the GRP on the studied factors:

$$Y = 490,872.79 + 32.06x1 + 3.43x2 - 19,021.42x3;$$

where Y is the GRP in actual prices, x1 is the internal expenditures on research and development, x2 is the volume of innovative goods, works, and services, and x3 is the share of organizations that implemented innovations.

The relationship of variables Y, x1, and x2 is positive (direct), and the relationship of Y and x3 is negative (inverse). Thus, it is safe to conclude that the level of GRP is influenced by the innovative activities of organizations although somewhat contradictory results on the relationship between the GRP and the share of organizations that implemented innovations were obtained. The negative coefficient indicates that the share of organizations that implemented innovations in general is not accompanied by economic growth of the economy. However, this does not negate various theories of innovative economic growth, but only reveals the features of today's Russian economy where the size of the business rather than the number of organizations that implement innovations, is crucial.

It is important to consider the economic activity of small businesses in order to understand the factors that determine the dynamics of the GRP. Statistical data on the number of small enterprises, turnover and investment in fixed assets of small enterprises in the regions of the Russian Federation were used as the analysed indicators (table 3).

	2011	2012	2013	2014	2015	2016	2017	2018
Number of small businesses, thousands of units	1,836.4	2,003.0	2,063.1	2,103.8	242.7[2]	2,770.6	2,754.6	2,659.9
Turnover of small businesses, RUB tln	22,610.2	23,463.7	24,781.6	26,392.2	17,292.9	38,877.0	48,459.2	53,314.2
Investments in fixed assets of small enterprises, RUB tln	431.6	521.5	574.9	664.4	409.3[2]	801.6	998.5	1,057.4

[1]- Source: Compiled by the authors according to Rosstat (http://www.gks.ru/)

[2]- excluding microenterprises

Table 3

Economic activity of small businesses in the regions of the Russian Federation[1]

In most studied regions, there is tendency to an increase in the number of small businesses. The total growth over the analysed period was 44.8%, and their turnover increased 2.4 times. The turnover of small businesses includes the cost of own-produced shipped goods, own-completed works and services, as well as revenue from the sale of outsourced goods (excluding value added tax, excise taxes and other similar mandatory payments). The increase in activity is, inter alia, due to the growth of investments in fixed assets of small enterprises. For the period from 2011 they increased 2.4 times. Investments in fixed assets are a set of expenditures for new construction, expansion, as well as reconstruction and modernization of facilities, which lead to an increase in the original cost of the object and are attributed to the additional capital of the organization, the purchase of machinery, equipment, vehicles, expenditures on forming the main herd, perennial plantings, etc.

A multiple correlation analysis was carried out to identify the impact of the number of small enterprises, turnover of small enterprises, and investment in fixed assets of small enterprises on GRP and to determine the tightness of the relationship between these indicators. The calculated coefficients of pair correlation between the values of the studied indicators prove a significant relationship between them. Pearson's multiple (aggregate) linear correlation coefficients for four variables allow drawing up an equation describing the dependence of the GRP on the studied factors:

$$Y= 279{,}651.4 – 2.69x1 + 1.90x2 – 11.35x3;$$

where Y is the average value of the GRP, x1 is the number of small businesses, x2 is the turnover of small enterprises, x3 is the amount of investment in fixed capital of small enterprises.

The relationship of variables Y, x1, and x3 is negative (inverse), and the relationship of Y and x2 is positive (direct). The multiple correlation coefficient was 0.9160, which estimated the dependence as very high. Thus, we can conclude with a high degree of probability that the volume of GRP depends on the turnover of small businesses. However, this dependence is the reverse in relation to the number of small enterprises and investments in the fixed capital of small enterprises. Although the data also differ by regions, which is proved by the studies of I.A. Minakov[18], E.K. Karpunina, E.A. Klimentova, and A.A. Dubovitski[19].

In general, the results of this research show that there is a significant imbalance between the actual and expected level of significance of the small business sector for the regional economy. The social aspect, which is often used by researchers in justifying various theories of entrepreneurship, is not taken into account. A significant factor determining the value of the GRP is only the turnover of small enterprises. In other words, an increase in the turnover of small businesses contributes to the growth of the GRP, which is undeniable. But the increase in the number of small enterprises and the amount of their investments in fixed assets, on the contrary, leads to a decrease in the GRP.

This is due to differences in the efficiency of resource use, which are often determined by the size of production. Small business is initially in a losing situation with other business entities. In medium- and large-sized organizations, as a rule, professional management system is formed, technologies for interaction with credit organizations are developed, and greater stability of functioning and lower risks can be provided. Small business organizations, for the most part, do not have the ability to maintain a developed management apparatus, which ultimately affects the performance of their activities.

Moreover, it is necessary to take into account the heterogeneity in the motives and expectations of business owners regarding their growth process. In other words, many firms do not set business growth as their main goal since they were created because of a desire for economic independence or simply because of the lack of jobs with decent wages. E. Hurst and B. W. Pugsley[20] write about this in their work: most firms start small and remain small throughout their life cycle. Very few small firms spend resources on research and development, getting a patent, or even copywriting or branding something related to the business. Some small businesses are not interested in economic growth because they are in industries with low effective size, for example, dental organizations, real estate agencies, insurance agents, and cosmetologists. Here, the firm's performance is directly related to the individual's skill set, and very often has growth boundaries. This is confirmed by the studies of E.L. Glaeser, W.R. Kerr, and G.A.M. Ponzetto[21] who consider the entrepreneur to be the single most important player in the modern economy. The characteristics of successful entrepreneurs are the ability to combine talents and manage others.

[18] I. A. Minakov y A. V. Nikitin, “Agricultural market development: Trends and prospects”, International Journal of Innovative Technology and Exploring Engineering Vol: 9 num 1 (2019): 3842-3847.

[19] E. K. Karpunina; E. A. Klimentova y A. A. Dubovitski, “Influence of innovative activity of small business on regional economic growth”, Proceedings of Southwestern state University. Series: Economics. Sociology. Management Vol: 9 num 1(30) (2019): 19-29. Retrieved from: https://swsu.ru/izvestiya/serieseconom/archiv/1_2019.pdf

[20] E. Hurst, B.W. Pugsley. What Do Small Businesses Do? NBER Working Paper No. 17041(2011).

[21] E. L. Glaeser; W. R. Kerr y G. A. M. Ponzetto, “Clusters of Entrepreneurship”, NBER Working Paper 15377 (2009)

The innovative activity of small businesses is also important for understanding the factors determining the volume and dynamics of the GRP. Statistical data on the share of small enterprises that implemented technological innovations, the share of innovative goods, works and services in the total volume of shipped goods, completed works and services of small enterprises, and the costs of technological innovations of small enterprises in the regions of the Russian Federation were used as the analysed indicators (Table 4).

According to the available statistical data (the frequency of statistical documentation is once every two years), the share of small enterprises implementing technological innovations is dynamically increasing. For the period from 2009 to 2017 it rose by 0.1 percentage point, although it still remains very low. In 2017, only 5.2% of the total number of enterprises carried out technological innovations, which was almost twice less than the total number of organizations in the Russian Federation. This confirms that many small business owners do not have goals and desires for innovation and economic growth.

Indicators	2009	2011	2013	2015	2017
Share of small enterprises that implemented technological innovations in the reporting year in the total number of surveyed small enterprises	4.1	5.1	4.8	4.5	5.2
Share of innovative goods, works, and services in the total volume of shipped goods, completed works and services provided by small businesses	1.38	1.48	2.07	1.64	1.59
Expenditures on technological innovations of small enterprises, RUB mln	6,793.5	9,479.3	13,510.5	12,151.8	19,220.4

[1]- Source: Compiled by the authors according to Rosstat (http://www.gks.ru/)

Table 4

Innovative activity of small enterprises in Central Federal District [1]

When organizing business, size is not the main motivating factor. At the same time, the cost of technological innovations for small enterprises has increased almost 3 times over this time, and the share of innovative goods, works, and services has increased only by 0.11 percentage points. In accordance with the generally accepted classification, the innovative activity of small businesses is mainly focused on the technological orientation and to a lesser extent on the product one.

To identify the impact of small business innovation activity on GRP, a multiple correlation analysis was conducted. The calculated coefficients of pair correlation between the values of the studied indicators show that there is a connection between them. The Pearson's multiple (aggregate) linear correlation coefficients for four variables allow drawing up an equation describing the dependence of the GRP on the studied factors:

$$Y= -1{,}095.34 + 388.78x1 – 663.73x2 + 6.74x3;$$

where Y is the value of the GRP, x1 is the share of small enterprises that implemented technological innovations, x2 is the share of innovative goods, works, services in the total volume of shipped goods, completed works, services of small enterprises, x3 is the cost of technological innovations of small enterprises.

The relationship of variables Y, x1, and x3 is positive (forward), and the relationship of Y and x2 is negative (reverse). The coefficient of multiple correlation amounted to 0.4647, which estimates the dependence as moderate. Thus, it can be concluded that the volume of GRP depends on the share of small enterprises that implemented technological innovations, the share of innovative goods, works, services, and the cost of technological innovations of small enterprises with a moderate degree of probability. It should be noted here that the growth of the volume and share of innovative products in general is not accompanied by economic growth of the economy due to the fact that they do not have significant advantages in the market, and above all, the price ones. The so-called innovative goods, works and services should, first of all, have relatively higher prices, which, with a comparable quantity, could provide greater surplus value and increase in the regional product. The price, in turn, is determined by the value of the product, its consumer properties. And if an innovative product has a relatively lower value in comparison with the usual one, then in the modern economy of agricultural and raw materials orientation, there are more interesting areas of business application for the final result. This testifies, inter alia, to an unsatisfactory level of efficiency of innovation costs for small businesses.

Discussion

The efficiency of the regional economy depends on the total efficiency of all its economic entities, regardless of the size of the business and the legal form of its implementation. It is important not to increase quantitative indicators but to ensure the productivity of small businesses and their contribution to the GRP in relative terms at a level not lower than the average and large businesses. In order to ensure the economic growth of the region, an effective organizational and economic mechanism is needed to realize the potential of small businesses, including through innovative development.

The strategic goal of regional innovation policy should be state support for innovation activity, not so much direct as indirect, aimed at creating a favourable innovation environment, as well as the formation of parity conditions for small businesses. It will help overcome the main barriers to business innovation and develop a favourable investment climate in the regions. When setting up subsidies, it is necessary to focus on supporting institutions that promote innovation and growth. These can be state guarantees of loans for small business development; granting access to special lending programs on preferential terms; exemption from various taxes and contributions; providing small businesses with preferences when placing government contracts, etc.

In the conditions of active development of digital economy, as noted in the studies by E. K. Karpunina, E.A. Yurina, I. A. Kuznetsov, A.A. Dubovitski[22], in Russian reality, a serious obstacle to innovation in manufacturing is the low information transparency – the lack of public information about innovative projects, as well as the organizational mechanism of application of innovative technologies. Large companies that conduct their own scientific research have the opportunity to carry out wide-scale innovation activities. Small business organizations are unable to compete with them on this issue due to limited financial resources. An important conclusion is made by J. E. Stiglitz[6] in this regard: a decrease in the availability of a set of ideas can lead to a decrease in the level of

[22] E. K. Karpunina; E. A. Yurina; I. A. Kuznetsov y A. A. Dubovitski, Growth potential and economic security threats in terms of digital economy ecosystem. Proceedings of the 33rd International Business Information Management Association Conference, IBIMA: Education Excellence and Innovation Management through Vision 2020(2019): 2669-2678.

innovation, and even to a lower level of investment in innovation. Accordingly, one of the main tasks is to create information resources on scientific and technical achievements, innovative projects and a mechanism for the further bringing of industry innovations to economic agents.

A significant obstacle to the growth of small businesses is the imperfection of the financial market, which is proved by the results of studies by R. Levine[23], Th. Beck, A. Demirguc-Kunt, L. Laeven, R. Levine[24]. Due to their characteristics the difficulties that economic agents face, directly depend on the scale of their activities. The smaller they are, the more difficult the firm's access to financial resources is, and the higher the transaction costs for capital inflows and financial services are. Banks, various financial funds, and securities markets provide funds to organizations and entrepreneurs and diversify risks. Improving the financial system can reduce the risks associated with individual projects, firms, industries, and regions. The ability of the financial system to ensure the diversification of service risks and the availability of financial resources for all business entities can have positive impact on long-term economic growth through the effective distribution of assets and savings.

Conclusion

This article presents the authors' view on understanding the role of small business and innovation in the economic development of regions, which still requires further research in this direction. However, it is important to realize that small business, despite its importance for the economy, is not a driver of economic growth, and that regions need serious efforts to increase economic and innovative activity in order to realize its potential.

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