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**Global Challenges and Prospects of the Modern Economic
Development**

**ENTREPRENEURIAL UNIVERSITIES AS DRIVERS OF
INNOVATIVE DEVELOPMENT OF REGIONS**

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Abstract

The regional economic system primarily depends on the achieved level of economic development, quality of life, competitiveness, while the key elements of the system are the level of development of science and education. According to new economic theories, the driving force behind sustainable economic growth is the developed technological change. Innovation and entrepreneurship also help prevent the decline of traditional industries by increasing productivity through more efficient working methods. The expansion of production, obtained through the growth of innovative potential of the higher education system, the restructuring of the economy in modern times is one of the strategic growth paths of the regions' socio-economic activity. The emphasis on cooperation between universities and business community began about two decades ago, but the recognition of this cooperation as critical to future economic and social development has become widespread in politics, governance and science recently. The correlation and regression analysis used by the authors and carried out using data from federal and regional statistical reporting, analysis of regulatory legal acts, information from rating agencies, made it possible to build a model that proves the need for joint activities of the entrepreneurial university, business community, innovative structures, authorities to achieve target indicators of state programs implemented in regions. The implementation of such a model is applicable in the economy of any of the Russian Federation's constituent entity interested in achieving sustainable economic growth, introducing innovations and producing high-tech and science-intensive products.

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1. Introduction

In the knowledge-based society, universities are increasingly considered to be the initiators of local development, since they can play a key role while producing knowledge and while disseminating and using it for commercial purposes. Nevertheless, the commitment of universities to economic and social progress should not be limited to “capitalization of knowledge”- they can act as local agents who must initiate entrepreneurial capital, promoting entrepreneurial thinking, actions and institutions, which may be even more important, since the availability of entrepreneurial opportunities can affect local development to a greater extent than, for example, the availability of natural or financial resources. Thus, the new mission of the “entrepreneurial university” is aimed at promoting social development and economic growth, going beyond the traditional tasks of research and teaching. If the university seeks to develop based on the entrepreneurial model, it must radically change its strategy. Without a clearly defined strategy, the university cannot contribute to the goals of society and economy, since the presence of the local university may be necessary, but it is not enough to guarantee economic development based on knowledge. To this end, the entrepreneurial orientation should be included in the mission of the university.

2. Problem Statement

The university is an institution with a long history, and over the centuries it has gone through several stages of its development. In a knowledge-based society, universities are increasingly seen as initiators of development, as they can play a key role not only for the production of knowledge, but also for its dissemination and commercial use. However, the commitment of universities to economic and social progress should not be limited to “knowledge capitalization”. Universities can act as local agents which must generate "entrepreneurial capital" by promoting "entrepreneurial thinking, action and institutions." This mission is the “third mission”, and it’s considered even more important because the availability of entrepreneurial opportunities can affect economic development to a greater extent than the availability of natural or financial resources. Thus, the new mission of the "entrepreneurial university" should be aimed at promoting social development and economic growth, going beyond the traditional tasks of research and teaching. The Entrepreneurial University plays a material role in a realization of economic innovation and increasing global competitiveness and social welfare of a particular region and the country.

3. Research Questions

The concept of entrepreneurial activity is multifaceted, and it involves the population in the formation of new organizations, management of developing companies, as well as the shutdown of the business. According to the research of Kirzner (1999), the role of an entrepreneur can be defined as an innovator, a risk manager, and an arbitrageur who participates in economic growth through creativity, new products and services, and the ability to compete internationally. However, the role of the entrepreneur remains uncertain until the end, since it is based on complex human behavior and depends on the cognitive ability of the entrepreneur, the environment that affects the person, and the economic policy implemented in the country. Until the 20th century, entrepreneurs applied new production methods, redistributed

resources for new opportunities, diversified production, and entered new markets through competition. Later, the focus of entrepreneurial activity shifted towards production scale and efficiency. In the past two decades, the knowledge and information revolution has revamped theoretical thinking linking the growth of entrepreneurship with new theories emerging in the field of industrial evolution or evolutionary economics. Evolutionary economics views entrepreneurs as agents of change, bringing new ideas to markets and accelerating growth through a competitive selection process. The general innovative role of entrepreneurs is the novelty of solutions (implementation of inventions) and new opportunities for their implementation (start-ups and entry into new markets). Wennekers and Thurik (1999) emphasized the importance of creating a new business based on innovation and penetration into new markets, since this strategy created more added value and provided good opportunities for achieving success.

The empirical research on entrepreneurship and its relationship to economic growth began at the beginning of the 21st century. One of the first conclusions concerned Organization for Economic Co-operation and Development (OECD) countries that show high growth in entrepreneurship through levels of business ownership, lower unemployment and high economic growth. The business start-up indicator is the main indicator that is widely used in scientific research of various scientists. The contribution of created enterprises to the formation of jobs was studied by Acs and Armington (2004). Their research resulted in the judgment that the role of new companies in job creation was previously underestimated, and that entrepreneurial activity is a powerful force that stimulates productivity, innovation and economic growth. In developing countries with high unemployment rates, the link between economic growth and entrepreneurship has attracted high attention of academics and policymakers.

Since about the 1990s, there has been a significant increase in the generation of by-products (spin-off) at the global level due to the growing interest in the most effective and efficient use of scientific knowledge, especially those obtained because of research funded from public funds (Miranda et al., 2017). Currently, academic spin-off-products are considered as an important tool due to their contribution to the creation of enterprises, job creation, in maintaining the balance of the economic system, as well as their positive impact on innovation processes (Orazbayeva et al., 2019).

One of the points of economic growth of both the country and the region is the development of entrepreneurship. Entrepreneurial activity is a way to realize a wide range of economically and socially significant goals, a source of meeting the needs of society (Ambarova & Filippova, 2017). In turn, the stimulation of student entrepreneurial activity can be a key direction of the economic development of Russia, allowing the most active group of the population to enter the labor market and realize themselves in activities with a high potential of human capital. At the same time, support for entrepreneurship in the student environment should be carried out at various levels of government - federal, regional and municipal. The implementation of programs related to develop entrepreneurial competencies among young people forms the internal environment for innovative activity as one of the components of the entrepreneurial university model.

University graduate startups make a positive contribution to the country's economy by generating income and job creation. The role of universities is essential here, as they should not only encourage students to become entrepreneurs, but also help and mentor creative students. It is widely recognized that there is a possibility of teaching entrepreneurial competencies, so most universities invest heavily in

entrepreneurship training (Islam, 2019). Most European universities focus on improving the attitudes and skills of entrepreneurs among their students, so that their ideas can help solve the problem of employment (Sánchez-Barrioluengo & Benneworth, 2019). Moreover, such skills and abilities allow students to enter the market. Students who have received entrepreneurial education are more likely to start their own business, as opposed to those who have not received such education. Universities need to focus on their goals, support and environment for enhancing entrepreneurial intentions of students (Ivascu et al., 2016). Researchers Turker and Selcuk (2009) point out that if the university provides adequate knowledge and inspiration for entrepreneurship, young people may have an increased opportunity to choose the entrepreneurial career. In this connection, many researchers believe that there is a positive impact of university support on the entrepreneurial competence of students (Shadova et al., 2015).

4. Purpose of the Study

An innovative system of economic development involves a change in the relationship between the private and public sectors, as well as between the state and science. An innovation ecosystem is a multifactorial phenomenon that operates under the influence of a number of circumstances. There are complex interrelationships between factors that do not allow us to consider them as a simple sum of isolated phenomena. Multivariate correlation-regression analysis allows you to study the relationship between three or more related features. According to the Strategy of scientific and technological development of the Russian Federation, the creation of technologies, products and services that meet the national interests of the country, necessary to improve the quality of life of the population and are demanded in the world community, is a timely response to the major challenges facing the country (Decree of the President of the Russian Federation No. 642 of 01.12.2016). According to the Organization for Economic Co-operation and Development (OECD), which played a key role in developing international guidelines for researching business innovation, Russia ranks last in terms of the number of companies producing innovative products, but it has some of the highest engagement rates with universities and government institutions. among other countries, which reflects the high development potential of this area (OECD, 2019). In parallel with the increased number of subsidiaries funded by universities, the purpose of the study was the environment to develop entrepreneurial innovation, to understand aspects such as the most effective university policies to promote entrepreneurial initiatives, business processes that are used to create them, and personal qualities of students, who took a step towards creating this type of the company.

5. Research Methods

Public-private partnership (PPP) sets goals and assists in transferring innovative technologies, strategic management of objects of long-term development programs, highly competitive technologies, and accumulating resources, which is closely related to small and medium-sized businesses. The emergence and development of various PPP models is associated with a different contribution of state participation to the model, since interaction can be expressed as a contract for the implementation of a project or joint activities with business entities. Amendments to legislative and regulatory acts entail the establishment of special fiscal regimes for PPP projects.

The rating of the regions of Russia, the methodology of which was approved by the Ministry of Economic Development of the Russian Federation, is used to assess the current PPP models (Order of the Ministry of Economic Development of Russia No. 762 of 25.11.2019). First place in the Rating for 2019 is occupied by Samara region, then Moscow and Moscow region.

The rating is made up of factors: regulatory support of the PPP sphere, development of the institutional environment, experience in implementing PPP projects. PPP agreements, as well as municipal-private partnership (MPP) agreements are very rare in Russian practice. According to the Information and analytical review “On the development of public-private partnership in the Russian Federation, prepared by the Ministry of Economic Development of the Russian Federation”, in February 2020, 25 agreements on PPP, MPP were concluded, the volume of investments for which amounted to 59.6 billion rubles. Mostly such agreements are in the field of education (14 agreements) (Ministry of Economic Development of the Russian Federation, 2020).

According to the National report on innovations in Russia 2017, a low level of commercialization of scientific developments is the main barrier to innovative development (Roscongress, 2019). Despite this fact, Russia's positions in various ratings are showing steady growth. In the Doing Business Rating, growth was 16 positions during 2017 - up to 35th place (The World Bank, 2019). In the Global Innovation Index the end of 2017, Russia is fixed at 45th place, in contrast to 64th place in 2009 (Global Innovation Index, 2017). In the Global competitiveness index, the rise was from 63rd in 2010 to 38th in 2017 (World Economic Forum, 2019). For a long time in Russia, the state policy of stimulating innovation had the character of multipolar activity. In many ways, support programs were implemented in parallel by various departments, through state programs, and therefore the instruments of state innovation policy did not accept a single systemic context. At the same time, the share of innovative enterprises in Russia is at the level of 11%, the level of Russian exports in the world export of high-tech goods is 0.4%, the share of innovative products in its total output is 8-9%. For more efficient economies of nature, there is a large proportion of those employed in small enterprises among the working-age population (about 50%). In Russia, only 5% of small businesses can be classified as innovative. The role of small business in the Russian economy has not increased in recent years, despite the presence of some government support programs.

One of the ways to solve the problems of growth of priority economic sectors, uniform development of territories, increasing the share of Russian goods in the world markets of science-intensive and high-tech products is to match the interests of the government and business in the innovation sphere (Guseva et al., 2016). Optimization of such interaction as a PPP model could help implement the innovation process in which private and public sectors function and interact in concert.

As possible directions of using PPP to increase the development of the economy, one can single out:

- implementation of innovation policy through programmatic government investments;
- organization and support of development institutions;
- formation and support of the innovative growth path to develop a high-tech cluster;
- creation and development of innovative clusters on a territorial basis.

We will study regional features of small business activity using the keys of the Samara region. The development of the Strategy of social and economic development of the Samara region for the period up to 2030 is based on the cluster approach (Strategy of social and economic development of the Samara region

for the period up to 2030, 2017). At the same time, mechanical engineering, petrochemicals, and aerospace are among the main clusters. The development of cluster initiatives in connection with the industrial specifics of the region is one of the main directions for further activities. The existing structure of entrepreneurial activity includes financial support institutions, centers for entrepreneurship support, development of innovative small enterprises, and organization of consulting services. Among the strengths of the region are its attractiveness for labor migration, a favorable cluster portfolio, and a significant level of economic diversification. Low innovation activity, labor productivity and the level of development of the logistics system can be attributed to weaknesses. The financial condition of large companies affects the budget of the region. The number of small businesses in the Samara region in 2018 amounted to 68,739. Information on the activities of small businesses in the region is shown in Table 1.

Table 1. Small business and innovative development indicators of the Samara region for 2014-2018

Indicator	2014	2015	2016	2017	2018
Number of small businesses, units	46900	47600	70263	69132	68739
Number of employees, people	279600	270500	234829	293813	288044
Turnover of organizations, million rubles	583500	583500,0	777849,0	869297,0	952380,9

Source: authors based on (Federal State Statistics Service for the Samara Region, 2020).

Small business accounts for about 17% of the employed population of the region's economy. According to 2019 data, the largest number of enterprises operates in the field of wholesale and retail trade, repair of vehicles and motorcycles (33.7%), construction (11.8%), real estate transactions (7.9%). The number of small businesses showed the greatest growth by 47.6% in 2016, then the number began to gradually decline. According to the given indicators, the Samara region lags the Nizhny Novgorod region and the Republic of Tatarstan, which also belong to the Volga Federal District. The infrastructure for supporting small and medium-sized businesses include areas related to the support of innovative enterprises, information and consulting, financial, property support, as well as in the field of training, retraining and advanced training.

Thus, it can be concluded that innovative potential of the region is not used effectively enough; the support measures provided by the authorities are not combined into a single system of support for entrepreneurship and innovation and are fragmented. It is necessary to search for a mechanism to achieve long-term economic growth in the region through state participation in activities of small and medium-sized enterprises that act as a driver of the regional economy. The target indicators of the region's economy in terms of small and medium-sized businesses are shown in Table 2.

Table 2. Target indicators of the region's economy regarding small and medium-sized businesses

Target indicator	Period, year			
	2021	2022	2023	2024
Number of people employed in small and medium-sized businesses in the Samara region, million people	0,480	0,501	0,519	0,535
Share of small and medium-sized businesses in GRP, %	27,6	29,0	30,9	32,5

Share of exporters who are small and medium-sized businesses, including individual entrepreneurs, in the total volume of non-resource exports, %	8,5	9,0	9,5	10
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Source: authors based on (Ministry of Economic Development and Investments of the Samara Region, 2019).

According to the Strategy for scientific and technological development of the Russian Federation, the key factors that determine the competitiveness of the national economy are superiority in research and development, a high rate of mastering new knowledge and creating innovative products (Decree of the President of the Russian Federation No. 642 of 01.12.2016). The Strategy notes the important role of Russia in the development of world science, while one of the barriers is a significant differentiation of scientific and educational organizations in terms of work efficiency, the concentration of research potential in several regions of the country.

6. Findings

One of the indicators of the effective implementation of the Strategy for scientific and technological development of the Russian Federation is the share of organizations implementing technological innovations in the total number of organizations (Decree of the President of the Russian Federation No. 642 of 01.12.2016). The study calculated the impact of indicators related to activities of universities, innovative organizations, private companies and government authorities to build a model of interaction and assess factors.

The following indicators were selected:

x_1 - the number of graduates of higher educational institutions in the region (for bachelor's, master's, specialist's programs), thousand people;

x_2 - the number of entrepreneurial organizations engaged in research and development;

x_3 - the number of personnel engaged in research and development, people;

x_4 - graduate students, people;

x_5 - volume of work performed, research and development services, million rubles;

x_6 - the number of advanced technologies used;

x_7 - innovative activity of organizations, %;

x_8 - costs of organizations on technological, marketing and organizational innovations, million rubles;

x_9 - cash income of the population from entrepreneurial activity, billion rubles.

Analyzing the above indicators for the Samara region, we can conclude that there is a steady downward trend in the number of graduate students (Figure 1).

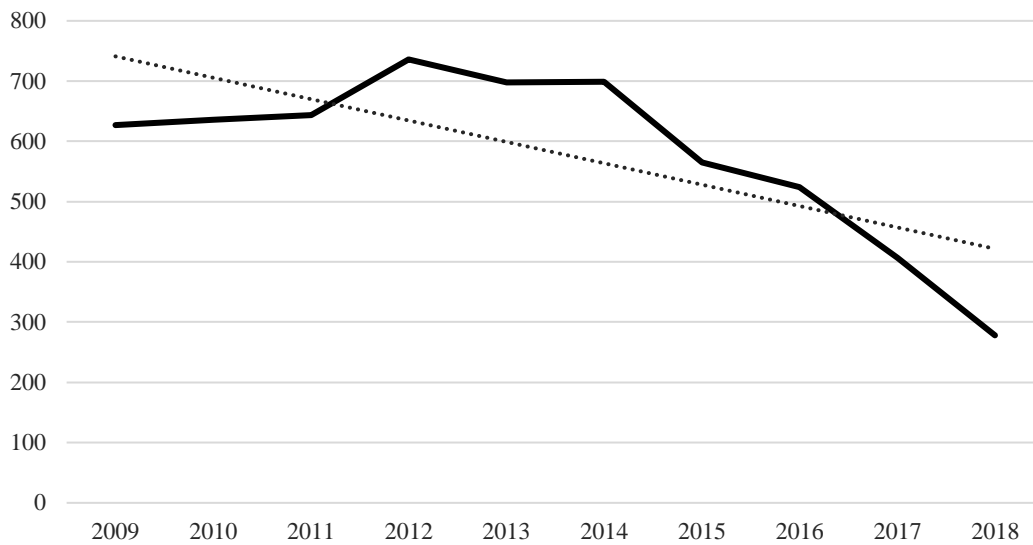


Figure 1. Graduate students in the Samara region, people
 Source: authors based on (Federal State Statistics Service for the Samara Region, 2020).

Despite this, the indicator of the volume of R&D completed tends to grow (Figure 2).

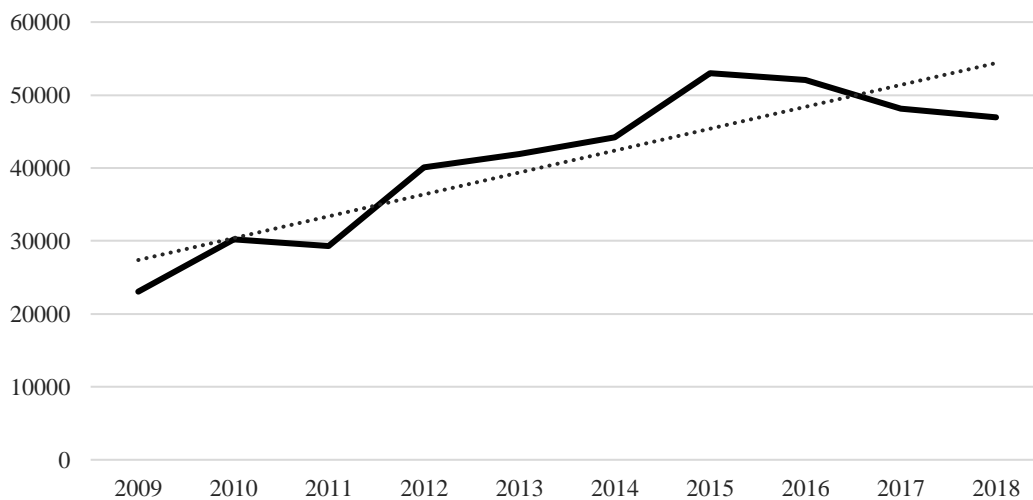


Figure 2. The volume of research and development completed in the Samara region
 Source: authors based on (Federal State Statistics Service for the Samara Region, 2020).

The following indicators have a downward trend: the graduation of specialists from higher educational institutions, the number of personnel engaged in research and development, the innovative activity of organizations, and the population's income from entrepreneurial activity. Growth is demonstrated by the indicators of the number of advanced technologies used and the costs of organizations on technological, marketing and organizational innovations. The number of business organizations remained practically unchanged in the period from 2009 to 2019.

Due to the carried out multivariate correlation-regression analysis, the following model was obtained:

$$y = 57.22 - 0.301x_1 + 1.340x_2 - 0.053x_3 - 0.511x_4 - 0.011x_5 - 0.018x_6$$

The factors included in the model make it possible to establish the following influence on the final function:

- a decrease in the number of graduates of higher educational institutions leads to a decrease in the share of organizations implementing technological innovations in the total number of organizations;
- an increase in the number of entrepreneurial organizations carrying out research and development, increases the share of organizations carrying out technological innovations in the total number of organizations;
- a decrease in the volume of completed research and development reduces the share of organizations carrying out technological innovations in the total number of organizations;
- a decrease in the number of advanced technologies reduces the share of organizations implementing technological innovations in the total number of organizations;
- a decrease in the costs of organizations on technological, marketing and organizational innovations reduces the share of organizations implementing technological innovations in the total number of organizations;
- a decrease in monetary incomes of the population from entrepreneurial activity reduces the share of organizations carrying out technological innovations in the total number of organizations.

The model demonstrates the need for interconnection between higher educational institutions, innovative structures, research organizations, the business community and government authorities to meet the indicators laid down in the Strategy for scientific and technological development of the Russian Federation (Decree of the President of the Russian Federation No. 642 of 01.12.2016).

7. Conclusion

The Entrepreneurial University is in active interaction with the external environment to intensify its innovative activities, fulfilling orders for scientific research, research and development work from industrial partners, creating small innovative enterprises to create high-tech products that are in demand at the leading enterprises in the region. The subjects of the innovative infrastructure of the region provide the entrepreneurial university with consulting, organizational, financial and legal support to implement innovative projects at the university site. The guarantor of the stability of the model is the Government of the region, which needs in meeting the specified growth indicators for the regional economy. The implementation of such a model is applicable in the economy of any constituent entity of the Russian Federation interested in achieving sustainable economic growth, introducing innovations and producing high-tech and science-intensive products. The Entrepreneurial University acts as a driver of the regional economy, a center of attraction and implementation of initiatives that improve the economic performance of both a region and Russia.

A significant factor in the regional development is the enrichment of a dynamic innovation ecosystem, which includes the development of many players, including innovative intermediaries such as incubators, venture capitalists, service providers, accounting and law firms, vocational training programs, labor markets, and social and non-profit organizations. These innovative intermediaries enrich the community environment that fosters innovation and entrepreneurial initiatives, as the success of innovation

depends on the availability of many complementary resources and opportunities. Thus, a fertile innovation ecosystem fosters effective networks and smooth pathways between different actors, allowing intellectual, financial and human resources to be redirected to where they are most needed or can be used most effectively in each phase of this development. Innovative intermediaries, such as venture capitalists, accounting and law firms, and recruiters, often act as effective guides to the necessary social media critical to innovation.

One of the main aspects of the transformation of higher educational institutions in Russia is the creation of the effective model of the regional innovation infrastructure, which is achievable by assigning a role to universities in the innovation ecosystem. Universities become product developers, and they are also looking for ways to introduce the created product into the markets (Volkodavova et al., 2019). The main barriers to the emergence of new forms of interaction between universities and companies are low motivation on the part of companies to introduce the latest technologies, lack of knowledge in universities about the actions necessary to implement developments in real production, lack of communication models between companies and industry, bureaucratic obstacles for university developers.

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