Formation of the innovation potential of the region on the basis of the investment activity activation process in the construction industry

M V Lyulyuchenko*, N A Demura
Belgorod State Technological University named after V.G. Shukhov, 46 Kostyukova str., Belgorod, 308012, Russia

E-mail: omml@bk.ru

Abstract. The team of authors made an attempt to study the main trends and problems in the formation of the innovative potential of the region based on the process of enhancing investment activity in the construction industry. The theoretical aspects of the innovation potential and investment activity in the construction industry within the region were analyzed and systematized in the article. The mechanism of the activating investment activity process influence in the construction industry on the formation of the innovative potential of the region and its development has been studied. The main opportunities for increasing the innovation potential by means of the investment activity intensification are identified.

Introduction
At the present development stage, the issues related to the transition to the model of the innovative economy are discussed at all levels. The subject to the course taken by the Russian government for innovation development and the introduction of a number of relevant government programs aimed at stimulating innovation processes in the economic sphere, the level of innovation activity remains at a rather low level. This is confirmed by many world rankings in which the Russian Federation is in the catching-up positions (Global Innovation Index 2018 shows Russia in 46th place, close to Chile and Vietnam) [1].

Considering the issues related to the innovation development of Russia, special attention should be paid to the regions that have potential growth points for innovations. The uneven development of regions is often observed: the Tomsk region is called the future effective innovation ecosystem in which the innovation process starts being activated, at the same time the other areas make only the first steps. When implementing the priority directions of the innovation sphere development in the Russian economy, it is necessary to form regional innovation systems activating the innovation processes and providing favorable conditions for the creation and commercialization of innovations. This will increase the level of competitiveness of regions and their economic growth. The optimal functioning of the innovation system of the region depends on the availability and effective use of the innovative potential of the region. There are various approaches to the definition of the innovative potential of a region. Generally, the innovation potential is a combination of resources (natural, human, financial, etc.) and the willingness to use them to intensify the innovation process in the region.
Innovation processes are closely interrelated with the investment activities. The investment atmosphere and the investment processes are one of the components of the innovation potential of the region. Thus, the intensification and activation of the investment activities in the region will positively influence the formation of innovative potential, and, therefore, will contribute to its innovative and economic development.

In modern conditions, an increasing outflow of investments from the Russian economy, according to reports of the Central Bank of the Russian Federation, the outflow of investments in 2018 increased by 2.7 times compared with 2017 and amounted to about $65 billion [2], capital-intensive industries deserve special attention (construction, metallurgy, engineering, mining), the development of which will contribute to the retention of investment capital in Russia and attract additional resources. In this case it is necessary to direct investment flows so that they ultimately stimulate the scientific and technological processes of these industries.

Within the Belgorod region one of such industries is construction, which has certain features and development trends. The construction industry is in a “depressed” state, which was caused by the consequences of the financial crisis and the problem of state “deregulation” in this industry.

Consideration of the processes of the innovative potential formation of the Belgorod region on the basis of an increased investment activity in the construction industry seems to be a rather topical issue.

**Purpose, objectives, research methods**
The purpose of this work is to study and improve the mechanism of the innovative potential formation of the region through the intensification of investment activities in the construction industry.

To achieve this goal, the following tasks were set and implemented:
- consideration of the theoretical aspects of the innovation potential and investment activity in the construction industry within the region;
- study of the interaction mechanism between the innovative potential of the region and the investment processes, in particular, the intensification of investment activities in the construction industry;
- identification of the main opportunities for increasing the innovation potential by the intensification of investment activities.

Considering that innovation is one of the main drivers of economic development in the region in modern conditions, and investment processes act as a foundation for the economy, the relevance of the chosen subject is undoubted.

The main methods and means of solving research problems are the analysis and comparison of various theoretical positions and statistical data on innovation development and investment activity of the region, as well as building a simulation model of the activating investment processes impact in the region on the innovation potential.

Innovations with optimal investment can be one of the fundamental factors for the economic development of the region, which is why the issues of forming the innovative potential of the region based on stimulating investment processes in the construction industry remain relevant.

The thesis of the innovative development considered in the study is reflected in the works of foreign and Russian scientists engaged in the highlighted issues: M. Albert, D. Campbell, A. Marshall, D. North, M. Porter, J. Schumpeter, L.I. Abalkin, A.G. Aganbegyan, A.A. Bogdanov, S.Yu. Glazyev, N.D. Kondratiev, Yu.V. Yakovlev, etc.

The issues related to the innovation processes in the region are considered by the Russian scientists: E.V. Gorshenin, A.G. Granberg, E.M. Buchwald, S.D. Valentey, A.L. Gaponenko, N.V. Zubarevich, N.I. Ivanova.

The questions of optimal investment policy are reflected in the research of such scholars as G.J. Alexander, S.B. Barnes, J. Bailey, V. Berens, G. Birman, L.J. Gitman, M.D. Jonk, D.M. Keynes, D. Northcott, D. Siegel, A.G. Steshin, P. Havranek, R. Holt, D. Shim, S. Schmidt, and others.

The formation of the innovative potential of a region is a rather complex and multidimensional process, which is influenced by many economic and social factors.
The results of the research

Initially, the concept of "innovative potential" was introduced into scientific term-circulation by the English economist K. Freeman in the second half of the 20th century.

There are various definitions of the “innovation potential” category; we consider their main ones in Table 1.

Table 1. The “innovative potential” concept definition

| Author            | Definition                                                                                                                                 |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| K. Freeman        | Innovation potential is considered as the possibilities, means and reserves that can be activated and applied to solve the problems associated with the creation of innovations in order to ensure the development of the economic system [3]. |
| P.N. Zavlin       | Innovation potential is as a set of intellectual, scientific, technical, material, industrial, financial and information resources [4].          |
| R.A. Fathutdinov  | Innovative potential is the degree of readiness to implement innovation [5].                                                                   |
| D.I. Kokurin      | Innovation potential is the untapped, unused, hidden potential of accumulated resources that can be used and implemented to achieve the economic goals of the region [6] |

The innovative potential of a region can be defined as follows: it is a combination of regional resources (financial, investment, human, material, natural, etc.), opportunities and economic participants served by infrastructure, whose main task is the creation and commercialization of innovations. In other words, the innovative potential of a region is a combination of the region’s potential: financial, investment, intellectual, industrial, research and other (Fig. 1).

The region’s innovative potential has the following key characteristics:

- **Purpose.** The focus of all processes on the continuous development.
- **Resources.** Availability of resources that will contribute to the continuous process of innovative development of the region.
- **Assets.** The region should have a number of assets (property, investment, intellectual, etc.), the use of which is aimed at innovative development.
- **Opportunities and abilities** aimed at optimal use of the resources for the purposes of the innovative development.

The optimal use of the innovative potential of a region is achieved at the moment when all the structural components (potentials) intersect and interact as close as possible. That is why the innovative potential should be considered from the point of view of a systematic approach.

One of the most important components of the innovation potential is the financial and investment potential. Investments are the foundation for innovative development. In modern conditions, the research is devoted to the process of attracting investment capital in the innovation sphere, but it should be noted that attracting investment in innovation without sufficient supply of traditional sectors and industries such as construction, agriculture, engineering, metallurgy and others with investment capital is unpromising.

As a part of the economic development of the Belgorod Region, we will consider the investment activities in the construction industry and the impact on the process of forming the region’s innovative potential.
Figure 1. The structure of the innovation potential of the region
Source: compiled by the authors

The active investment policy of the Belgorod region, aimed at solving the priority tasks of economic modernization and the production sphere renewal, its diversification, contributes to the formation of the optimal investment climate [7].

According to the Russian regions’ attractiveness rating, done by the Expert RA rating agency, in 2018, the group of the rating leaders (IC1 group) includes two of the largest megacities - Moscow and St. Petersburg (which has been unchanged since 2017), among their closest pursuers (group IC2) are Tatarstan, the Moscow Region, the Yamalo-Nenets Autonomous District, the Sakhalin Region, the Leningrad Region, the Belgorod Region and the Tyumen Region [8].

The investment projects in the Belgorod region are being implemented in the industrial and agricultural-industrial complex, road construction, and the social sphere, housing, and the region settlements comprehensive improvement [9].

The volume of the investment resources allocated to fixed assets in 2018 was at the level of 134 billion rubles, which is equal to 1% of the investments volume in Russia as a whole. But in the period from 2016 there is a trend towards the slower growth. This can be seen in the dynamics of the investments in the Belgorod region (Table 2), according to which there has been a decline in investment and a decrease in the growth rate of investment in the region for the last 3 years.

Table 2. The investment dynamics in the Belgorod region

| Year       | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017     | 2018    |
|------------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| Billion rub. (in actual prices) | 963.13  | 125.99  | 136.82  | 129.41  | 120.66  | 147.21  | 143.79  | 142.69   | 134.16  |
| As a percentage of the previous year (in) | 122.3   | 118.4   | 101.4   | 89.7    | 90.7    | 114.3   | 91.3    | 93.9     | 89.9    |
comparable prices) Source: compiled by the authors according to Belgorodstat [10]

In the volume of the gross regional product (GRP) in basic prices, the share of the economic activity “Construction” in 2018 is equal to 6.36%, which is lower than in 2017 (6.98%) [10, 11]. The volume of work performed by the type of the activity “Construction” in 2018 amounted to 92.8 billion rubles or 101.7% to the level of 2017 in comparable prices (Table 3).

Table 3. Dynamics of the volume of work by type of economic activity “Construction” in the Belgorod region

| Indicator                                | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  |
|------------------------------------------|-------|-------|-------|-------|-------|-------|
| In actual prices, mln. rub.              | 71282.4 | 63342.7 | 76726.1 | 70984.8 | 80621.4 | 92754.5 |
| In comparable prices, % of the previous year | 84.6  | 87  | 102.6  | 89.5  | 100  | 101.7  |

Source: compiled by the authors according to Belgorodstat [10]

Innovations are one of the key factors for increasing the level of competitiveness of the region, both in the local and foreign markets. The government of the region carries out a range of activities for the development and activation of research and innovation activities in the region, as well as the involvement of private business in the process of technological development, as evidenced by the data of Belgorodstat (Table 4).

Table 4. Dynamics of expenses for technological innovations by type of the innovation activity in the Belgorod region, mln. rub.

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|
| Technological Innovation Costs         | 3072.3 | 2136.6 | 1629.0 | 1107.4 | 4108.8 | 2392.6 | 20339.0 | 23852.4 |
| including:                            |       |       |       |       |       |       |       |      |
| research and development of the new products, services and methods of their production (transfer), the new production processes | 29.4 | 99.6 | 46.5 | 379.6 | 378.1 | 197.9 | 9407.0 | 8363.8 |
| acquisition of machinery and equipment related to technological innovation | 2170.9 | 1561.7 | 1192.4 | 505.5 | 917.8 | 1074.8 | 6296.9 | 9884.5 |
| acquisition of new technologies       | 9.0  | 122.6 | 4.8  | 26.6  | 5.6  | 87.7  | 94.0  |      |
| software acquisition                  | 1.7  | 5.3  | 1.0  | 4.9  | 6.8  | 10.8  | 153.1 | 144.5 |
| engineering, including the preparation of feasibility studies, production design, trial production and testing, installation and commissioning, and other developments | 9.0  | 128.3 | 108.2 | 7.8  | 56.1  |      | 2080.3 | 3785.3 |
| other technological innovation costs  | 830.2 | 308.2 | 150.3 | 193.1 | 2630.7 | 927.3 | 1874.7 | 1084.9 |

Source: compiled by the authors according to Belgorodstat [10]

In the dynamics the technological innovations’ costs tend to increase throughout the period under review.
It is important to note that the growth of the innovative development important indicator (the cost of technological innovations in the region) is accompanied by an increase in the work volume on the economic form "Construction", which allows to identify the relationship between them. This relationship lies in the fact that the increase in the investment in capital-intensive traditional industries (construction, engineering, agricultural sector) leads to the optimization of the investment environment in the region, as it reduces the risks of the investment capital rapid outflow and also stimulates innovation processes through innovative development orders (Figure 2).

Figure 2. The mechanism of the investment activity activization process influence on the formation of innovative potential

Summary
One of the main objectives of the region development is the formation of a balanced spatial development model based on the investment activities intensification in capital-intensive industries, in particular in construction. A rational investment policy is a prerequisite for the development of both the economy as a whole and innovation, which in the future will become the driver of the economic development. Thus, an increase in investment in the construction industry is one of the components of the process of forming the innovative potential of a region. The formation of the innovative potential of a region is an important process for its economic development, representing a complex system and a combination of different potentials. One of the most important components of the innovation potential is the investment potential, within the framework of which it is important to intensify investments in traditional capital-intensive sectors, such as construction, the agricultural-industrial complex, etc., which will create a favorable investment climate and ensure sustainable ongoing economic development of the region.

References
[1] Global Innovation Index 2018. Energizing the World with Innovation. Cornell University, INSEAD, WIPO. 2018. Information on https://www.wipo.int/publications/ru/details.jsp?id=4330
[2] Monitoring the economic situation in Russia: trends and challenges of socio-economic development 2019 7 (90) (2019) 20. Information on http: // www.iep.ru/files/text/crisis_monitoring/2019_7-90_April.pdf
[3] Dezhkina I P 2010 Innovation potential of the economic system and its assessment (methods of formation and evaluation) (Infra-M, Moscow).
[4] Zavlin P N, Kazantsev A K, Mindeli L E 2004 Fundamentals of innovation management (Theory and practice, Economy, Moscow).
[5] Fatkhutdinov R A 2011 Innovation management: a textbook for universities (Peter, Saint-Petersburg).
[6] Kokurin D I 2001 Innovation activity (Exam, Moscow).
[7] Doroshenko Y A, Bukhonova S M, Minaeva L A, Somina I V, Manin A V, Avilova Z N, Doroshenko Y A 2014 R & D potential: International Development of Applied Engineering Research 9 (22) 16871–16880.
[8] Rating of investment attractiveness of the Russian regions in 2018 IPR-6-06112018.pdf [Electronic resource]. Information on https://www.ra-national.ru
[9] Demura N A, Yarmolenko L I 2017 Information support, state and prospects of economic development of enterprises of the construction industry (Bulletin of BSTU named after V.G. Shukhov) 10 186–193.

[10] The territorial body of the Federal State Statistics Service in the Belgorod region. Official site. [Electronic resource]. Information on http://belg.gks.ru/wps/wcm/connect/rosstat_ts/belg/ru/statistics/enterprises/investment/

[11] Information and analytical material on the results of the socio-economic development of the Belgorod region in 2018 [Electronic resource]. Information on http://belgorod.bezformata.com/listnews/belgorodskoj-oblasti-za-2018-god/73967283/

Acknowledgements
The work is realized in the framework of the Program of flagship university development on the base of the Belgorod State Technological University named after V.G. Shukhov