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**CLUSTER ANALYSIS OF REGIONAL
INNOVATION POTENTIAL OF LATVIA,
LITHUANIA AND BELARUS**

**КЛАСТЕРНЫЙ АНАЛИЗ РЕГИОНАЛЬНОГО
ИННОВАЦИОННОГО ПОТЕНЦИАЛА
ЛАТВИИ, ЛИТВЫ И БЕЛАРУСИ**

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Abstract. Researches of innovation potential are becoming increasingly relevant in our time. Its role is becoming increasingly important not only at the state, but also at the regional level. The purpose of this study is to assess the factors of innovation potential of the regions of Latvia, Lithuania and Belarus and divide them into clusters. To achieve the goal, the author sets several tasks: to assess the factors of the innovative potential of Latvia, Lithuania and Belarus, their structure, divide the regions into clusters and determine the profile and position of the innovative potential of these regions. The author identifies existing problems of interaction between factors of innovative potential of the regions of Latvia, Lithuania and Belarus and suggests ways to solve them.

Аннотация. Исследования инновационного потенциала становятся все более актуальными в наше время. Его роль становится все более значимой не только на государственном, но и на региональном уровне. Целью данного исследования является оценка факторов инновационного потенциала регионов Латвии, Литвы и Беларуси и разделение их на кластеры. Для достижения цели автор ставит несколько задач: оценить факторы инновационного потенциала Латвии, Литвы и Беларуси, их структуру, разделить регионы на кластеры и определить профиль и положение инновационного потенциала данных регионов. Автор выявляет существующие проблемы взаимодействия факторов инновационного потенциала регионов Латвии, Литвы и Беларуси и предлагает пути их решения.

In today's world, research related to the development of innovation potential is becoming more and more relevant. This is explained by the fact that

innovation potential is a very important element in ensuring the development and competitiveness of the country, and especially of the regions. The analysis of innovation potential factors provides an opportunity to determine the weak points of regional development and to find opportunities for solving the given problems.

The purpose of the study: to assess the innovation potential factors of the regions of Latvia, Lithuania and Belarus, to divide them into clusters.

To achieve the given goal, the following research tasks have been set:

- to assess the innovation potential factors of the regions of Latvia, Lithuania and Belarus;
- to divide the regions of Latvia, Lithuania and Belarus into clusters;
- to determine the factors profile and location of the innovation potential of the regions of Latvia, Lithuania and Belarus.

The scientific novelty of the study: a profile of the factors forming the innovation potential of the regions of Latvia, Lithuania and Belarus has been determined, which allows for a deeper analysis of the aspects of the development of the innovation potential, to identify existing problems and to find ways to solve them.

The practical application in the national economy is significant. The research can be used in practice at various levels of state structures to develop policies that would stimulate the introduction and development of innovations in specific regions. The regions of Latvia, Lithuania and Belarus are divided into clusters according to the analysis of innovation potential factors, regions with an abundance/lack of various factors have been identified, recommendations have been made for the implementation of cooperation and development programs at the regional and national level.

The author studies the innovation potential of the region according to the following factors [1, 2, 3]:

- scientifically technical and educational factors, which include the number of scientific research centers and the number of people employed in them, the number of students in secondary schools of general education, the number of students enrolled in vocational schools and universities, etc. indicators in relative units of measurement;
- labor force factors, which include population density, population up to working age, at the working age, above working age, natural increase, migration rate, level of demographic burden, economic activity, etc. indicators in relative units;
- economic investment factors, which include GDP, value-added indicators by types of activity, distribution of companies by main types of activity, volumes of accumulated direct foreign investments, volumes of non-financial investments, inflation, average wages, number of companies, etc. indicators in relative units;

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- infrastructure factors, which include the relative indicators of the region's territorial area, distribution of the territory by land type, road density, computer and Internet availability, purposes of Internet use, provision of passenger cars, etc. indicators in relative units;
- ecological factors, which include indicators of emissions of harmful substances into the atmosphere (kg per capita), relative indicators of the chemical composition of harmful substances.

The author divides the regions of Latvia, Lithuania and Belarus into clusters according to the factors structure of the regions' innovation potential (see Figure 1).

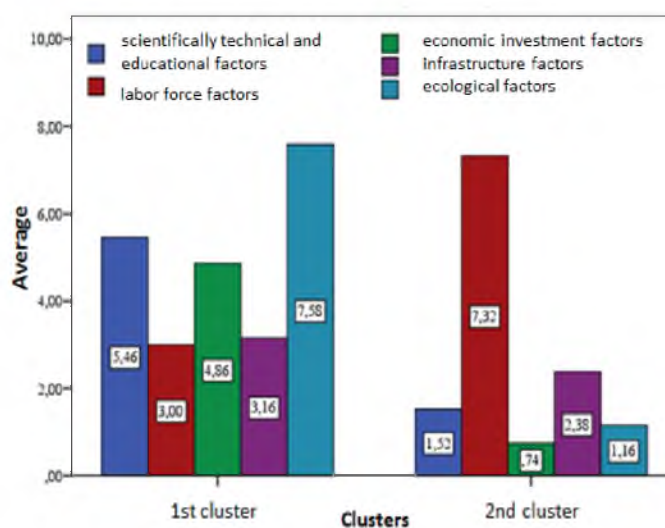


Figure 1 – The structure of innovation potential clusters in the regions of Latvia, Lithuania and Belarus according to the integral normalized values of the objective indicators

Source: created by the author in the SPSS program based on statistical data calculations of the regions of Latvia, Lithuania and Belarus

The factor structure of the innovation potential of the regions of Latvia, Lithuania and Belarus according to the integral normalized values of the objective indicators (see Figure 1) shows that these regions can be divided into two clusters. In the first cluster, ecological factors have the highest value with an absolute value of 7.58, while infrastructure factors (3.16) and labor factors have the lowest values (3.00). In the second cluster, labor factors are in first place with an absolute value of 7.32, which greatly exceeds the values of the other factors: the absolute values of infrastructure factors are three times lower, scientific, technical and educational factors – 5 times, ecological factors – 6 times, and the absolute value of economic investment factors is almost 10 times lower.

The distribution of regions in clusters is as follows:

– 1st cluster: Riga region, Pieriga region, Vidzeme region, Kurzeme region, Zemgale region, Latgale region, Vilnius county, Alytus county, Kaunas county, Klaipeda county, Marijampole county, Panevežus county, Siauliai county, Taurage county, Utena county, Minsk city;

– 2nd cluster: Telšiai county, Brest oblast, Vitebsk oblast, Gomel oblast, Grodno oblast, Minsk oblast, Mogilev oblast.

The first cluster includes all regions and counties of Latvia and Lithuania, except for the Telšiai county, which is included in the second cluster, and Minsk city - the capital of Belarus, and the second cluster - all oblasts of Belarus, except for the capital of the country.

According to the author, it would be useful to develop cooperation between the regions of the two clusters by attracting labor factors from the second cluster to the regions of the first cluster, because there is a large surplus of them in the second cluster and they are not used fully, but the regions of the second cluster have a rather low level of infrastructural factors and absolutely certainly – the level of other factors is extremely insufficient. By combining factors, the development of the studied regions would reach a new level of development.

Summary

The regions of Latvia, Lithuania and Belarus can be divided into two clusters according to the integral normalized values of the objective indicators. The first cluster consists of regions of Latvia and Lithuania (except Telšiai county) and Minsk. The second cluster includes Telsiai county and all oblasts of Belarus except Minsk. In the first cluster, the level of labor factors is too low and the values of other factors are relatively high. The regions of the second cluster have a very high level of labor factors and a low level of other factors. There are a little more infrastructure factors, but their level is certainly not sufficient either. The first cluster is more homogeneous in terms of scientific and technical, education, economic investment, infrastructure, ecological factors, while the second cluster is in terms of workforce potential. Thus, the author recommends developing cross-border cooperation, compensating insufficient factors and attracting factors from other regions.

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