

MODELING THE REGIONS OF BELARUS COMPETITIVENESS BASED ON PANEL DATA

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Abstract

Comparative analysis of the regions of Belarus competitiveness based on panel data for 2011–2014 years was conducted. A system of indicators that reflect the competitiveness in the regions under study was built. It consists of five units: quality of the population, living standards, quality of social services, quality of the ecological niche, cultural condition of society, investment attractiveness. Integral indicator of the competitiveness for regions was built using the factor analysis. All baseline indicators were sorted according to their impact on the rating.

1 Introduction

Countries competitiveness is estimated annually by international non-governmental organization, the World Economic Forum (WEF). The Republic of Belarus has not taken part in the WEF ratings. Improving the Republic of Belarus competitiveness and the participation in the WEF ratings is scheduled for 2016–2020 by the Government program.

The competitive advantages of the country directly depend on the competitiveness of its regions. In this regard, forming of region competitiveness is the main goal in the task of improving the competitiveness of the country.

The region's competitiveness will mean the ability of the regional economy to stably produce and consume goods and services in competition with the goods and services produced in other regions, while ensuring the continued growth of quality of life [1].

This definition highlights two fundamental directions for providing the growth of the region competitiveness: achieving the high quality of life and improving the region investment attractiveness. Accordingly, the region competitiveness estimate is suggested to be performed based on these two groups of indicators.

2 The system of indicators

The system of indicators composed in this work consists of five units: quality of population (8 indicators), standard of living (4 indicators), quality of social sphere (4 indicators), quality of the environment (3 indicators), investment attractiveness (7 indicators).

Table 1: Factor loadings of indicators related to the first principal factor

Indicator	Factor 1
Percentage of employees with higher education organizations	0.98
Paid services for population, per capita	0.91
Age dependency rate	-0.90
Population provision with housing	-0.89
Ratio of per capita income to the minimum subsistence budget	0.89
Rate of migration increase	0.85
Retail turnover of trade	0.84
Provision with doctors	0.82
Registered unemployment rate	-0.76
Rate of natural increase	0.69
Share of innovation-active organizations in companies	0.68
Life expectancy	0.65

Official statistics, published in the collections of National Statistical Committee of the Republic of Belarus [2], are used for selected indicators.

The integral indicator of the Grodno region districts competitiveness was built based on panel data in [3] according to the 2008–2010 period.

Such an important factor in investment attractiveness, as the innovative activity of industrial organizations, has been being recorded in the official statistics since 2011. The regions of Belarus competitiveness estimation is built here taking into account this factor according to 2011 data. Competitiveness rating of regions is obtained base on panel data for 2011–2014 years.

A technique based on the methods of applied statistics was used for the construction of integral indicator [3].

Comparability of data was carried out by matching to the minimum consumer budget by the end of the year.

3 Competitiveness in the regions of Belarus

Original 26 indicators were scaled on the interval $[0, 1]$ for comparability of indicators, measured in different units. The indicators were then transformed according to the principal components method of factor analysis into the 4 principal factors. Thus all the indicators were associated with one of the 4 main factors. The total percentage of variance, saved by them, is 73.4% (the first factor saves 35.9% of the variance). The factor loadings values of the first principal factor are listed in table 1.

Integral indicator of the quality of life was obtained using the equation

$$R = 35.9F_1 + 15.7F_2 + 12.1F_3 + 9.7F_4,$$

where R is the competitiveness integral indicator, F_1, F_2, F_3, F_4 — values of the first principal factors. The percentage of the dispersion, saved by them, is taken as weight.

Table 2: The regions of Belarus competitiveness rating for 2011–2014 years

Region	2011	Region	2012	Region	2013	Region	2014
Minsk city	71.0	Minsk city	85.0	Minsk city	105.1	Minsk city	101.1
Brest	−16.0	Grodno	−3.2	Brest	18.6	Grodno	17.5
Grodno	−19.0	Mogilev	−8.9	Grodno	4.3	Brest	10.4
Mogilev	−31.7	Brest	−10.5	Mogilev	−3.9	Mogilev	3.3
Vitebsk	−43.1	Minsk	−30.7	Gomel	−5.0	Gomel	−5.2
Gomel	−48.2	Gomel	−33.1	Minsk	−14.2	Vitebsk	−13.1
Minsk	−55.2	Vitebsk	−35.3	Vitebsk	−22.8	Minsk	−17.2

Table 3: The regions of Belarus competitiveness dynamics for 2011–2014

Region	Year	R	Region	Year	R
Minsk city	2013	105.1	Minsk	2012	−30.7
Minsk city	2014	101.1	Minsk	2011	−55.2
Minsk city	2012	85.0	Vitebsk	2014	−13.1
Minsk city	2011	71.0	Vitebsk	2013	−22.8
Brest	2013	18.6	Vitebsk	2012	−35.3
Brest	2014	10.4	Vitebsk	2011	−43.1
Brest	2012	−10.5	Grodno	2014	17.5
Brest	2011	−16.0	Grodno	2013	4.3
Gomel	2013	−5.0	Grodno	2012	−3.2
Gomel	2014	−5.2	Grodno	2011	−19.0
Gomel	2012	−33.1	Mogilev	2014	3.3
Gomel	2011	−48.2	Mogilev	2013	−3.9
Minsk	2013	−14.2	Mogilev	2012	−8.9
Minsk	2014	−17.2	Mogilev	2011	−31.7

4 Comparative analysis of the competitiveness in the regions of Belarus

Comparative analysis on the basis of panel data allows you to not only build a rating of regions, but also to analyze the dynamics of the competitiveness of each region for the period of study. As a result regions can be sorted by years (table 2) and by their dynamics (table 3).

Minsk city is the permanent leader. Grodno and Brest regions are highly competitive due to the standard of living (table 2).

The lowest values of the integral indicators for the regions of the Republic of Belarus are observed in 2011. For Brest, Gomel, Minsk regions and Minsk city integral indicator of competitiveness decreased in 2014 comparing to 2013 year. Positive dynamics remained in Grodno, Vitebsk and Mogilev regions in 2014 (table 3).

5 Conclusion

The most important competitiveness growth factors of Grodno region districts for the period under review were revealed.

The quality of population: the proportion of employees with higher education in organizations, age dependency rate, rate of natural increase, rate of migration increase, life expectancy.

The investment attractiveness: share of the shipped innovative products.

The standard of living: population provision with housing, the ratio of per capita income to the minimum subsistence budget, retail turnover of trade, paid services for population.

Quality of social services: provision with doctors.

The same results were obtained by the study of the competitiveness in Grodno region [4].

In order to solve the identified problems it is, first of all, necessary to create new jobs and thus attract young working population to districts, as well as to implement a package of measures stimulating the development of small and medium businesses in the fields of material production, innovation and provision of public services.

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