Territorial analysis of structural and sectoral shifts in the steppe Russian-Kazakh cross-border region

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Abstract. The most important aspect for sustainable development of cross-border territories is a balanced sectoral structure of the economy. At the current stage of development, processes of transformation and restructuring of the economy occur in the Russian-Kazakh cross-border region, resulting in structural and sectoral shifts that expand the spatial division of labour and shape the further specialization of the region. This paper studies transformation of the sectoral structure of the Russian and Kazakh border regions by the main types of economic activity, including various components of the productive and non-productive sectors (manufacturing, mining, energy, trade, transport, agriculture, etc.). As a result, we found a structural and sectoral restructuring of the economy in the transboundary regions, affecting a wide range of different industries, while at the same time the regional economy experienced a catching-up phase, the share of the non-productive sector was growing, and the share of industry and agriculture, although declining, remained high.

1. Introduction

Our study analyses the current structural and sectoral shifts in 12 regions of Russia and 7 regions of Kazakhstan. This area is mainly located within the steppe biome of Eurasia, with a total border region area of 2,606 km², stretching 3,500 km from west to east, and more than 1,500 km from north to south. Latitudinal location of the region defines the significant length of the interstate border, which is the longest continuous land border in the world, its length is 7,499 km. The landlocked location of the region on the border between Europe and Asia, among the main centres of world trade, facilitates the development of its transport corridors and infrastructure in both west-east and north-south directions. As a result, this area, due to its geographical location, socio-economic characteristics, and also natural conditions and resources, has a wide range for development of various sectors of the economy [1, 2].

2. Material and Methods

Regional structural and sectoral shift is an interdependent, inversely proportional change in industries that just as the main ones in the sectoral structure, determining the specialization and economic development of the area, so complex, complementary, which leads to a deepening or weakening of regional specialization. Among the various types of structural and sectoral shifts, it is necessary to distinguish the following: 1 – by sector type: general and industrial; 2 – by type of specialization of the region: mono-specialized and multi-specialized; 3 – by sectoral scale: intrasectoral and intersectoral.
To understand the deviations in the structure of sectors, we should use the volume of the structural and sectoral shift, which means a certain average value. At the same time, selection of the average value as a reference point stems from the fact that the average value reflects the general and specific, which is characteristic of structural and sectoral shifts in the studied regions [3, 4].

3. Results and Discussion

Our analysis of the sectoral structure for the cross-border region has shown an almost two-fold higher share of agriculture than in Russia and Kazakhstan. Since the cross-border region area has more favourable natural and climatic conditions for agriculture, this sector contributed significantly to the overall structure of the economy. At the same time, the share of industry and the service sector was slightly different as compared to those for Russia and Kazakhstan, but we found no significant differences. If we directly compare the sectoral structure of Russian and Kazakh border regions, practically no differences were recorded here (Table 1).

Table 1. The dynamics of the sectoral structure in Russia, Kazakhstan, and the cross-border region for 2005 and 2017, %.

|          | 2005 | 2017 |
|----------|------|------|
| Russia   |      |      |
| Agriculture | 5.5  | 4.6  |
| Industry  | 40.8 | 39.7 |
| Services  | 53.7 | 55.7 |
| Kazakhstan|      |      |
| Agriculture | 7.0  | 4.5  |
| Industry  | 41.5 | 32.3 |
| Services  | 51.5 | 63.2 |
| Borderlands of Russia | 11.7 | 8.7  |
| Agriculture | 40.5 | 40.6 |
| Industry  | 47.8 | 50.7 |
| Services  | 43   | 51.2 |
| Borderlands of Kazakhstan | 12.2 | 8.7  |
| Agriculture | 44.8 | 40.1 |
| Industry  | 43   | 51.2 |

Analysing the dynamics of the structural and sectoral shift, both in the cross-border region and across countries as a whole, similar changes can be observed. The share of productive sectors decreased and the share of the non-productive sectors grew [5]. However, the share of industrial production in the cross-border zone declined more slowly than in the countries as a whole. Thus, the share of manufacturing industry in the transboundary regions of Russia remained almost unchanged [6], but in the transboundary regions of Kazakhstan it decreased by 4.7%. During this period, the share of manufacturing industry in Russia decreased by 1.1%, and in Kazakhstan by 9.2%. The share of agricultural sectors also decreased, but this occurred more significantly in the cross-border region, by 3% in the Russian part and by 3.5% in the Kazakh regions.

At the same time, there was significant growth in the non-productive sector: it was actively being transformed. The growth of the service sector in the Russian transboundary area amounted to 2.9%, and it was 8.2% in regions located within the Kazakh transboundary area.

When studying the structural and sectoral shift at the regional level, similar trends were observed (Figure 1). If in 2005 the non-productive sector was predominant in 9 out of 19 regions of the Russian-Kazakh transboundary area, in 2017 the number of such regions increased to 13. The increasing share during this period was recorded in 14 regions. The largest increase occurred in such regions as the Altai Republic – 23.2%, Aktobe region – 16.3% and Omsk region – 12.7%. The largest decrease in the share was observed in the Tyumen region – 27.2% and Astrakhan region – 8.7%, but it was not so much due to a reduction in the non-productive sphere, as to an increase in volumes of other sectors.

The number of regions dominated by industrial production decreased from 10 to 6, while the reduction in the share occurred in 11 regions. The largest decline in the industrial sector was observed in the Altai Republic – 28.5%, in Aktobe – 16.6% and Omsk regions – 11.7%. While the maximum growth in the share of industry was observed in the Tyumen and Astrakhan regions, it reached 28.1% and 11%. Such a significant structural and sectoral shift in the industrial production of these regions was attributed to the growth in the petrochemical sector, and also in the production of rubber and plastic products.
Figure 1. The dynamics of the share of the main activities in the regions of the Russian-Kazakh cross-border region for 2005 and 2017.

The agricultural production was not the predominant sector in any of the regions located within the Russian-Kazakh transboundary area, but its share significantly exceeded the average value for other regions of both Russia and Kazakhstan. A decrease in the share of agriculture between 2005 and 2017 occurred in 15 of the 19 steppe regions. The largest decline was recorded in North Kazakhstan – 10.9% and Kostanay – 10.6% regions, and the largest growth was observed in the Altai Republic – 5.3%.

When analysing the regions across the steppe biome depending on their specialization, most of them belonged to multi-specialized with a high degree of economic diversification, and only two regions had a pronounced specialization and could be attributed to mono-specialized entities. In particular, in the Orenburg Region, the share of mineral extraction accounted for about 40% of GRP, which posed serious socio-economic and environmental challenges to the region in terms of further sustainable development of the area. Another region with a low degree of economic diversification was the North Kazakhstan, where agriculture accounted for about 25.3% of GRP, this was more than 5 times higher than this indicator for the entire Kazakhstan and almost 3 times for the transboundary regions of Kazakhstan.

The most important result of the structural and sectoral shift was the increasing specialization. This process was continuous and it showed changes in the volumes of both the dominant and other sectors of the economy [7]. In the transboundary regions, most of the structural and sectoral shift was associated with the dominant branches of the non-productive sector, but in many areas, non-dominant branches accounted for the main contribution to these changes (Figure 2).
4. Conclusion

In recent decades, the Russian–Kazakh cross-border region has been undergoing a structural and sectoral restructurin of the economy. The transformation affects a wide range of economic sectors: from agriculture to energy, metallurgy, trade, transport, etc. The transboundary regions are currently going through a stage of catching up development, the share of the non-productive sector is steadily growing, currently it is 50.9%, but this is less than the worldwide average of 63%. At the same time, the percentage of industry – 40.4% and agriculture – 8.7% is decreasing, but it still remains high and exceeds comparable indicators worldwide (industry – 30%, agriculture – 6.4%). These structural imbalances are modern challenges and require significant efforts to optimize them [8, 9]. However, we found no significant asymmetry in the structural and sectoral shifts directly between the Russian and Kazakh sides of the transboundary area.

From the above analysis of modern structural and sectoral shifts in the steppe biome, a number of regional features can be identified:

- Significant growth in the share of the non-productive sector (trade, transport) due to the reduction of traditional activities (manufacturing, mining, agriculture): the Republic of Altai, Aktobe, Omsk and Kostanay regions;

- Dramatic transformation of the economy structure (change of dominant sectors – a significant reduction in the share of the service sector with proportional growth of industry) – Tyumen and Astrakhan regions;

- A high degradation of the economy old sectors with a slight increase in new activities (mainly in the service sector): Altai Republic, North Kazakhstan region;
- Minor changes in the overall structure while maintaining the dominant role of traditional sectors of the economy: Saratov, Pavlodar and East Kazakhstan regions;
- The absence of meaningful structural and sectoral shifts (maintaining almost complete proportions between the main types of economic activity): Samara and Orenburg regions.

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