

# Economical and Geographical Analysis of the Spatial Development of Regional Centers in Baikal Region

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**Abstract** – The twentieth century for Russia is the age of political, socio-economic and territorial transformations. Naturally, these processes are reflected on the spatial development. From this perspective, investigating the development of urban systems under conditions of global challenges is high on the agenda. In the regions with resource-based economy—including Baikal region—the strategic priorities of the socio-economic development are primarily focused on continued specialization on resources, which (in the view of the global challenges) is short sighted and very dangerous in terms of national security. The work compares the cartographic method of population estimation and assessment of competitiveness level to review the process of the spatial development of urban systems in Baikal region under contemporary conditions. The economic and geographic analysis allowed identifying the main problems and highlighting the strategic priorities of regional center positioning in Baikal region.

**Keywords** – *spatial development; regional centers of Baikal region; transformation; positioning.*

## I. INTRODUCTION

Modern urban spatial development of Russia is very intense, which opens a plethora of opportunities for progressive growth and poses a complex of problems conditioned by global and state-level challenges (economic, ecological, demographical, resource-related, sociocultural).

The understanding of stable balanced development and elaboration of strategies is impossible without consideration of complex economical and geographical analysis of spatial development factors. The complexities of transformation processes are elucidated in a number of works by P.Ya. Baklanov, I. Brade, A.G. Druzhinin, G.M. Lappo,

T.G. Nefedova, R.A. Popov, B.L. Radnaev, I.L. Slepukhina, A.I. Treivish, A.K. Tulokhonov and others [1, 2, 4–9].

In this connection, the relevant objects for economical and geographical analysis are regional centers having richer development potential that, according to the theory of regional growth by G. Fridman, position their strategic impact on the surrounding territory, such determining the trajectory for further development.

The role of this study is to comprehensively analyze the spatial development of the regional centers in Baikal region under the conditions of modern transformation processes.

## II. METHODS AND MATERIALS

In modern conditions, the positioning of territories is the basis for the strategic development. From the perspective of geography, the positioning is a process of both adaptation to external and internal operation environment of a territorial socio-economic system and simultaneous alteration (if possible) of this environment [9]. Thus, the positioning is an active realization process determined by the geostrategy which depends on the factors of spatial development.

The determinative factors of spatial developing are the advantages of the territory that, according to the model of P. Krugman are divided into two groups of factors [17]. The factors of the primary nature are availability of natural resources that are demanded by the market and geographic position. We believe that geopolitical position should be included in this group as well. These advantages exist despite the human activity. The factors of the secondary nature include the following advantages: agglomeration effect (high urban population density which, due to the scale, provides a saving), human capital (education, health, labor motivation, mobility

and adaptability of population), infrastructure [10] and institutes, promoting the improvement of the entrepreneurship climate, population mobility, dissemination of innovations, etc.

All these factors effect the spatial development of positioning of territories with different force and in different combinations.

For Baikal region, the primary nature factors have higher importance, primarily the availability of various natural resources by demanded global market, remote geographic and vulnerable geopolitical positions.

Let us consider this factor in more details. Baikal regions is unique in terms of its geographic position: it covers the territory of south-western Siberia and northern part of Mongolia. The total area is 1.5 mln sq. km. The Russian part of Baikal region is distributed among the subjects of the RF as follows: 73% is the Republic of Buryatia, 21% is Zabaykalsky Krai and 6% is Irkutsk region.

Regarding its economic and geographic position, Baikal region belongs to the median type, i.e. “transition zone” (between leading regions and outsiders). The population as on 01.01. 2018 was about 4.5 mln people, the population density is less than 3 ppl /km<sup>2</sup>) [22]. The geostrategical positioning is very important in the strategic sense due to the geographical position of Baikal region. This is promoted, in the first place, by the transboundariness of the natural-resource potential and advantage of the transportation and geographic position.

On the planetary scale, Baikal region makes an appreciable contribution to biosphere processes [11]. Here lays a tremendous potential of ecological benefits and services that can be used to develop ecotourism. The total annual recreational capacity of Baikal region, on various estimates, amounts to 1–2 mln people.

As to the macrogeopolitical position of Baikal region, it is very vulnerable. The transboundary geopolitical asymmetry is very strong. The world’s geopolitical powers, such as USA, China, Japan, Germany, Great Britain, France, and macroregions—Asia-Pacific Region, UN, NATO where China, being the closest neighbor (border country), turns into a powerful nation in terms of economic and demographic potential [12]. Indeed, in border provinces of China adjacent to Zabaykalsky Krai and Russia’s Far East, the population amounts to nearly 150 mln people, while in Russian part it is about 10 mln people. Moreover, Russian foreign policy pays low attention to Zabaykalsky Krai, particularly to Republic of Buryatia, as a strategically vital geopolitical base of the state. Over the recent years, the Pacific development vector has been having higher priority, which is confirmed by the adopted Russian Federation Spatial Development Strategy to 2025 [14].

The consideration of the spatial development should note that the territories of Siberia and Far East provides no conditions for effective inclusion into the world’s economical networks, which fosters the expansion [12]. Thus, modern

transformations necessitate the creation of Baikal strategic macroregion with powerful eco-smart regional centers focused on updated, highly competitive, innovative, sustainable and balanced development potential.

The analysis of the influence of secondary-nature factors included regional centers of Baikal region: Irkutsk, Ulan-Ude and Chita, where the cartographic method was used, because it is more demonstrative for the agglomeration effect of space development, together with the integral assessment of competitiveness.

During the transition period, the system of urban resettlement in Baikal region underwent quantitative and qualitative alterations, which was conditioned by the combination of external and internal political and socio-economic factors, as well as their synergistic effect on the dynamics of population in regional centers.

The spatial nonuniformity in the Asian part of Russia determined the model of urbanization in Baikal region. According to the official statistics, the urbanization level in Baikal region reaches 60% (as on January 1, 2018) [22]. Thus, the geostrategical positioning, development level of urban settlements, their attractiveness and comfort is the primary strategic task.

General urbanization trends in the region are presented in Figs. 1–6. The statistical materials used are the results of pan-Russian population count campaigns of 2002 and 2010, as well as the results of population recounting between these years. The cartographic illustration of the population dynamics in the settlements implements a color-based scale: green means the growth of population; red means its reduction; blue means the population staying the same (or changing negligibly); black means deserted settlements. The markers are divided according to the population of the settlements using 7 criteria: 1) less than 100 people; 2) 100–500; 3) 500–1000; 4) 1000–5000; 5) 5000–10000; 6) 10K–50K; 7) 50K–100K.

#### *A. Republic of Buryatia*

Evidently from Fig. 1, in 2002–2018 the population of the Republic of Buryatia increased insignificantly from 981.2 [19] to 982.8 [27] thousand people (the increment is 0.17%). In general, across in the republic and in the majority of settlements, there is an out migration towards the center. The capital, Ulan-Ude, primarily expands owing to rural population.

Unlike Irkutsk, the Ulan-Ude agglomeration is not that numerous; the radius of the agglomeration effect is only 30–40 km (Figs. 1 and 2) [19, 26]. The main territories attracting immigration inside the republic are Ivolginskiy, western Zaigrayevskiy and northern Tarbagatayskiy regions.

In addition, the regions of growth include middle strand of Baikal lake (from village Dulan to village Maksimikha) where the transport accessibility and tourism appeal make it demanded by both locals and non-residents as a recreational venue.

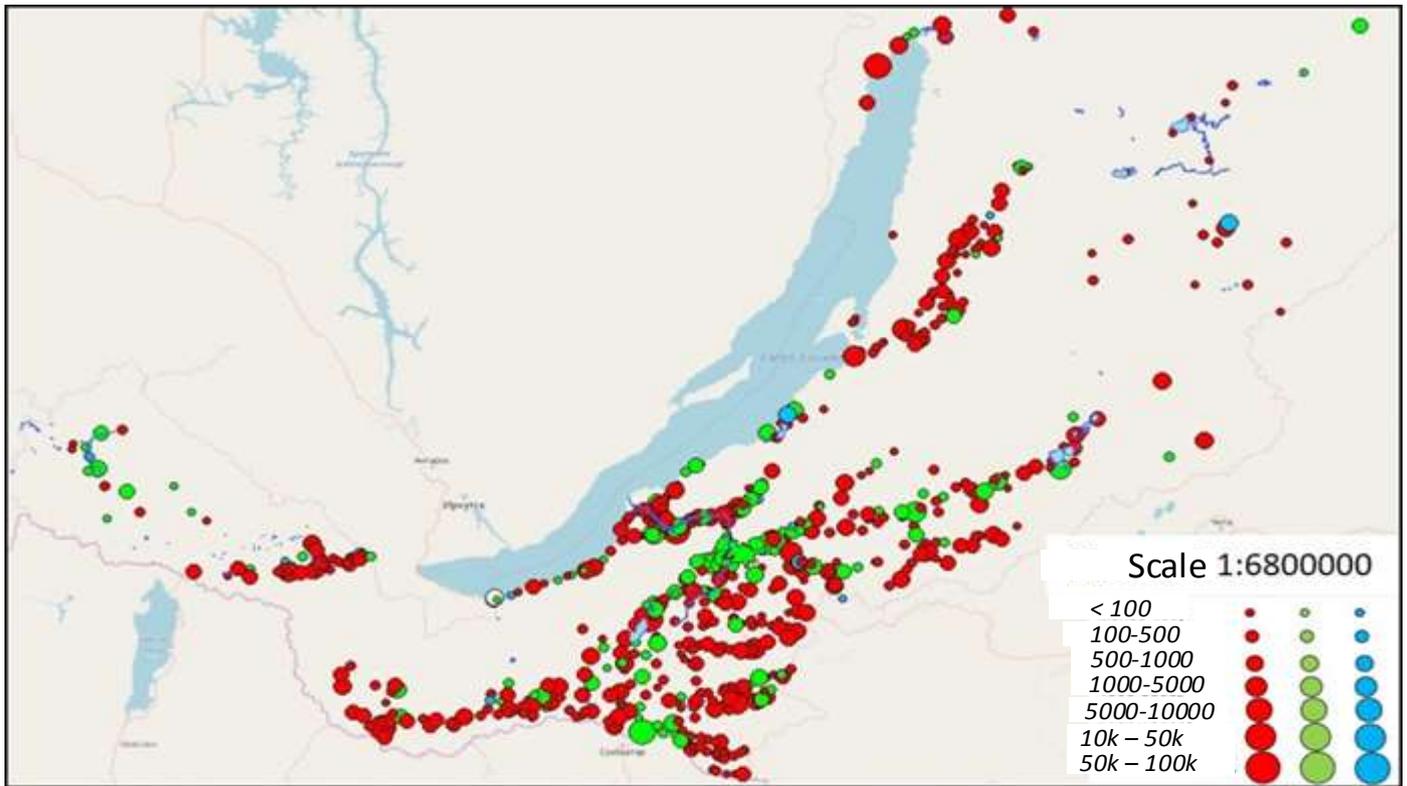


Fig. 1. Population dynamics in settlements of Republic of Buryatia

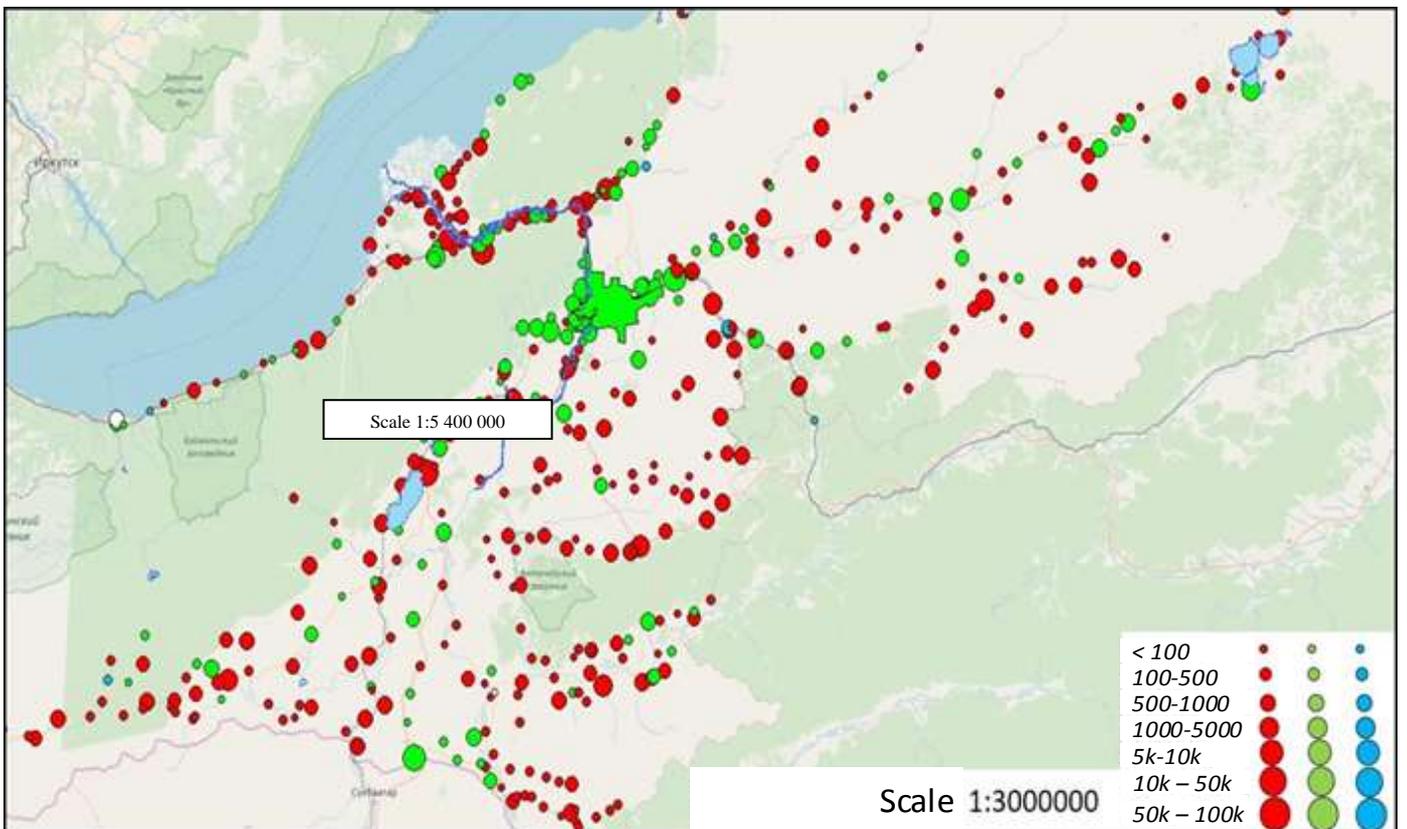


Fig. 2. Population dynamics in settlements of southern part of Republic of Buryatia

### B. Irkutsk region

In general, for Irkutsk region, sharp depopulation is typical. In 2002–2018, the population of the region decreased from 2581.7 [19] to 2398.6 [27] thousand people (the decrease is 7.1%). The main region of growth is Irkutsk agglomeration and suburban settlements.

In terms of population change, Irkutsk region can be divided into three zones (Fig. 3) [20, 29, 30]:

- *Northern* (zone of Baikal-Amur Mainline, middle course of Angara river, drainage basin of Lena river and far northern regions) where the number of deserted settlements prevails over the rest of the territory.
- *Central* (north-western regions of Irkutsk (Irkutsk-Cheremkhovo plain) along Trans-Siberian railway and Angara river and the Ust-Ordyn Buryat Autonomous

Area) where the absence of jobs conditions the out migration of the working force towards the center.

- *Southern* (Irkutsk agglomeration, Sludyansky and Olkhonsky districts); this zone demonstrates positive growth. Due to the metropolitan character of Irkutsk, it attracts and concentrates an appreciable part of labor resources; the agglomeration effect is 50–60 km around the city. Rural population conversely reduces fast. Different programs for young specialists providing land lots, settling-in allowance and other promotions in villages cannot fix the situation. The grants of the Ministry of Agriculture also have no effect due to lacking target markets and worsening climatic conditions. For instance, over the last 15 years the region has experienced shortages of water, droughts and fires [18].

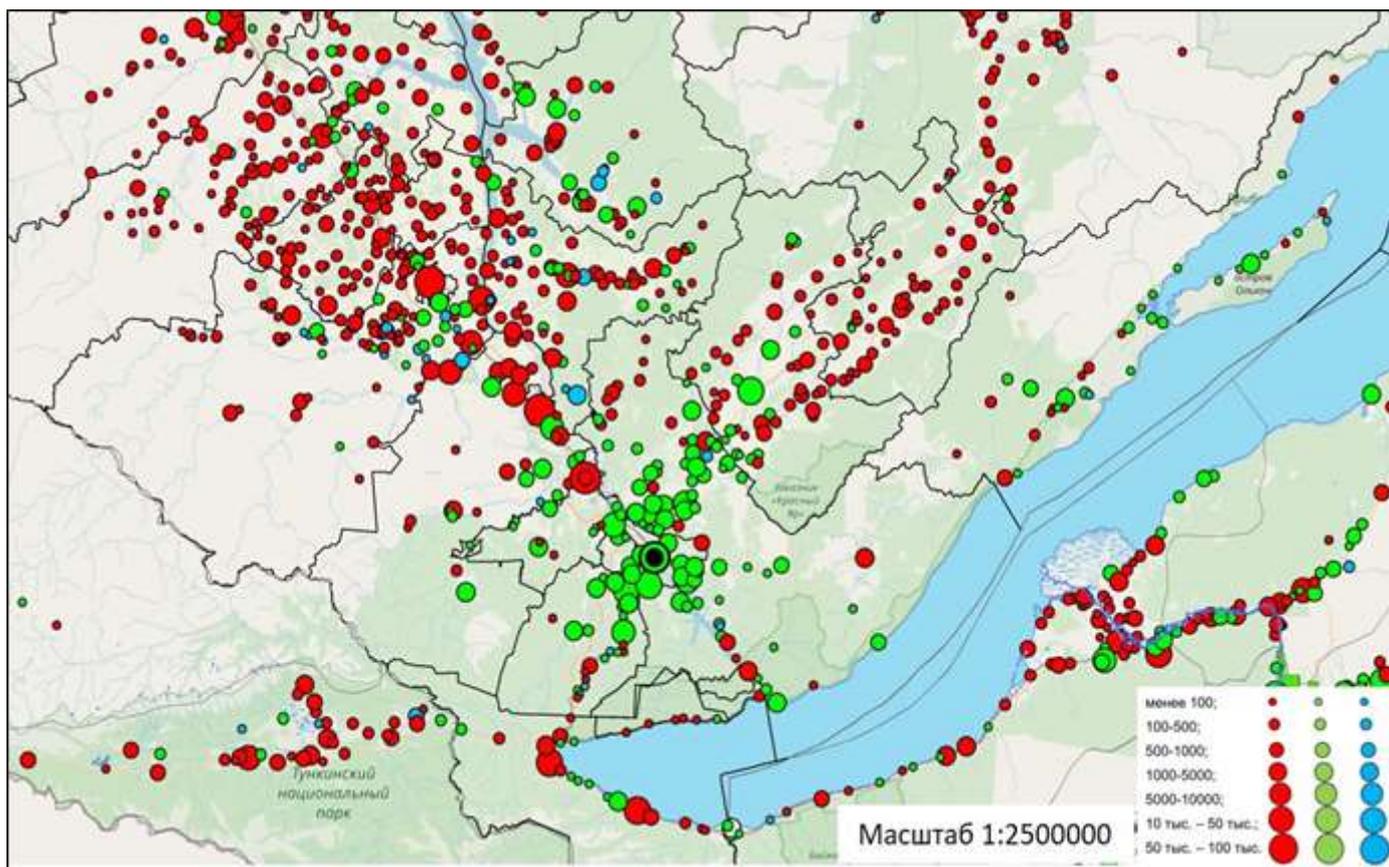


Fig. 3. Population dynamics in settlements of southern part of Irkutsk region

### C. Zabaykalsky Krai

Over the considered period, the population of Zabaykalsky Krai has decreased by 6.6%. The areas of growth are regional centers Chita and Aginskoye village. The first area, Chitinsky (Figs. 4 and 5) propagates from north-west to south-east from Chits suburbans to Karymskoye and adjacent villages. The length of the area is about 150 km. The second area, Aginsky (Fig. 5) propagates from west to east from Duldurga to

Mogotui. The agglomeration effect is about 130 km. Chita, as well as Zabaykalsky Krai as a whole, unlike the neighboring districts is less attractive and is characterized by constant out migration of population. Interestingly, from the moment of Krai formation in 2008 by union of Chitinsk region and Agin-Buryat Autonomous Area, it demonstrates constant reduction of population. In general, the migration situation is characterized by the domination of the number of leaving over the number of coming [21, 28].

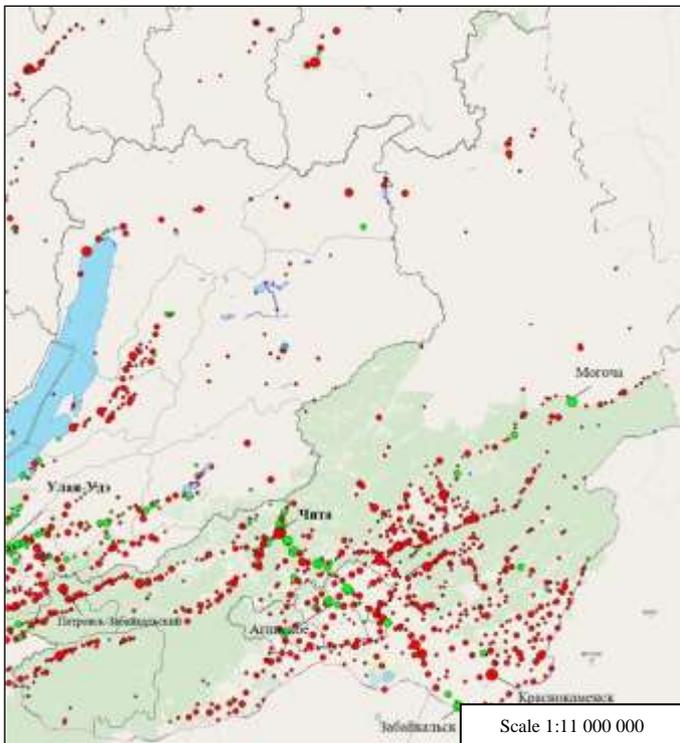


Fig. 4. Population dynamics in settlements of Zabaykalsky Krai

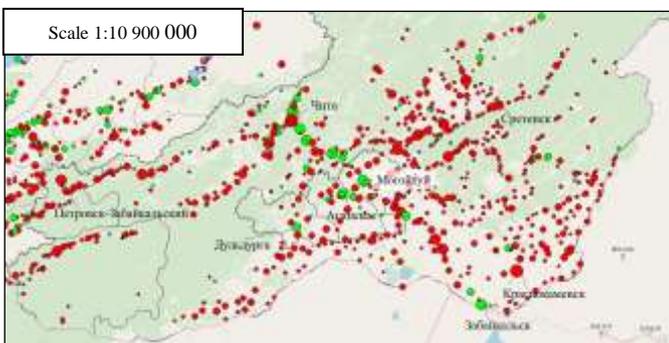


Fig. 5. Population dynamics in settlements of southern part of Zabaykalsky Krai

### III. RESULTS

The analysis of the competitiveness of the regional centers was based on the integral estimation of the indicators of the main factors of spatial positioning: socio-economic, infrastructural, institutional, cultural-enlightenment and ecological ones [3].

The assessment of the level of spatial positioning competitiveness of Irkutsk, Ulan-Ude and Chita in 2009–2017 is depicted in Fig. 7 [22 -25].

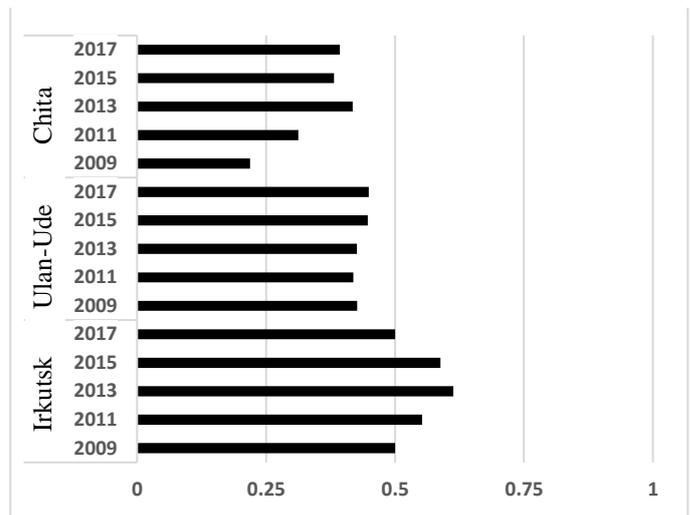


Fig. 6. Estimation of spatial positioning competitiveness of regional centers of Baikal region in 2009–2017

To measure the spatial positioning competitiveness, we used the following boundaries from [0] to [1] determining the state: crisis [0–0.25], pre-crisis [0.26–0.5], stability [0.6–0.75] and competitiveness [0.76–1].

The assessment of the level of spatial positioning competitiveness of Irkutsk, Ulan-Ude and Chita in 2009–2017 shows that the positions are far from competitive ones. Owing to more developed manufacturing infrastructure, Irkutsk holds stable position in the region. Ulan-Ude and Chita are in the pre-crisis state of development. In general, the spatial positioning does not meet the strategic priority goals of global and nationwide development. We believe that considering the global challenges, the strategically important directions of regional center development are education, culture, health care, tourism and traditional natural resource management.

### IV. CONCLUSIONS

The analysis has shown that the factors of secondary nature act as the development barriers: the institutional environment is adverse, investments in human capital are minuscule, the agglomeration effect manifests at the level of competition between regional centers, low population density, underdeveloped infrastructure considerably worsen the problems of strategic development and national security of the region.

The solution of nationwide tasks of spatial development requires intense development of the factors of secondary nature that should answer long-term strategic development priorities. Indeed, the goals of strategic development of the Asian part of Russia on the basis of adopted Russian Federation Spatial Development Strategy to 2025 again include quite abstract solutions primarily focused on further exploitation of natural resources of eastern regions. Moreover, this strategy, along with its predecessors, is not supported by any of financial obligations on the part of the state [14]. Moreover, in terms of national security remains unclear the division of geostrategically important Baikal macroregion into two macroregions: Angaro-Eniseysky, including Irkutsk region, and Far Eastern

macroregion that includes Republic of Buryatia and Zabaykalsky Krai. Thus, modern geopolitical situation at eastern boundaries of the state demands more specific strategic approach including extensive and progressive mechanisms in spatial positioning.

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