

# *On potential competition between town agglomerations*

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**Abstract** — The article analyzes possible elements of competition between neighboring town agglomerations. First of all, the research makes a distinction between the notions of “urban agglomeration” and “agglomeration process” and specifies the “spatial competition” category. This became the methodological foundation for the following hypothesis: closely located agglomeration sharing a common border create conditions for competition because town agglomerations are a certain agglomerated space that objectively tends to expand. The agglomeration of cities is a lengthy process so it is necessary to distinguish the agglomeration process and actual achievement of agglomeration. Previous research indicates that actual competition between town agglomerations is possible if agglomeration have already been formed. Certain types of urban agglomeration have a two-level competition: between the centers of neighboring agglomerations and competition within one agglomeration conurbation having two relatively equal core cities. The novelty of this study is in its approach to competition between Russian town agglomerations basing on spatial competition theory. The aim of the research is to test the hypothesis about the competition between urban agglomeration in the southern part of Western Siberia. The study revealed that that neighboring regions in the southern part of Western Siberia do not have fully formed agglomerations so the competition can be characterized as potential. Kemerovo Oblast demonstrates he biggest progress: it has two core cities and this enables us to adopt the notion of “Kuzbass agglomeration conurbation”. Kuzbass conurbation is under pressure from competitive neighboring agglomerations; besides, it shows elements of competition between its core cities, Kemerovo and Novokuznetsk. Negative consequences of competition between bordering agglomerations is possible within the limits of developing macroregions.

**Keywords** — *Kuzbass agglomeration; space; town agglomeration; spatial competition*

## I. INTRODUCTION

The 21<sup>st</sup>-century urbanization type caused significant scientific interest in urban agglomeration problems and their actual functioning. The common problem is the discrepancy between urban agglomeration theory and practice if creating agglomerated spaces [1:277]. The problems of town agglomerations and their functioning have been analyzed by various scientific disciplines causing differences in understanding of main categories of agglomeration process. The agglomeration space has the potential for development and expansion, thus agglomeration space may not coincide with administrative borders. In this case, spatial competition between agglomerations may occur. In an urban agglomeration, competitive relations between cities transform into a combination of competition and cooperation [2:134-135]. National studies do not focus on town agglomerations because they are not fully formed in Russia and the notions of regional competition and agglomeration competition are considered to be identical.

A town agglomeration is formed when the region reaches a certain level of economic and modernizational development. Town agglomerations have a scope that could be limited under certain conditions. Such limitations can be imposed by neighboring agglomerations sharing a common border. In this case neighboring agglomerations can compete with one another, primarily for workforce.

The relevant spatial objective for the Russian Federation is to create macroregions (called cross-border agglomerations by foreign scientists). The necessity for their formation is determined by high concentration of population and active economic development in town agglomerations. Thus, it seems reasonable to answer under what conditions

agglomerations with common administrative border may compete and what role cross-border macroregions play on the agglomerated territory.

The aim of this research is to reveal possible conditions for competition between agglomerations sharing a common border at the example of potential agglomerations in the southern part of Western Siberia.

## II. MATERIALS AND METHODS (MODEL)

The scientific community has not reached a consensus on the definition of urban agglomeration. However, town agglomerations have been studied since the beginning of the 20<sup>th</sup> century. Modern studies written in English point out two agglomeration types: urban agglomeration and town agglomeration. Urban agglomerations (global cities) may appear only on a certain level of economic development while town agglomerations can be formed in any part of the country [2:126; 3:299]. Russian scientific literature includes many theoretical works and practical studies on problems of existing town agglomerations [4]. Russian researches also have a discrepancy between urban agglomeration category and actual statistics of urban agglomeration. Also, the problem of potential competition between town agglomerations needs to be analyzed.

The methodology of our analysis of potential competition between town agglomerations is based on spatial competition theory. Modern studies on this problem are represented by works of G. Stigler, P. Krugman, M. Porter, [5; 6; 7]. It is necessary to differentiate territorial and spatial competition. The criterion for this differentiation is the difference between the subject and the object of competition. According to location theory, any agents compete for limited resources on one market; while according to spatial theory subject compete for a spatially extended market share. We believe that the spatial competition category is applicable to town agglomeration analysis because agglomerated space tends to expand beyond administrative limits. We understand agglomerated space as an organized environment consisting of the core city and surrounding urban territories [8:209]. The adequate methods have been applied for analyzing competition in agglomeration conurbations [9:173].

## III. RESULTS AND DISCUSSION

### A. *Competition between agglomerations*

The main characteristic of the town agglomeration is the concentration of people with a certain space (agglomerated area) including the core city and agglomeration "shadow" of satellite towns. The specific feature of modern town agglomerations is the difference between administrative borders and borders of agglomerated space. Human resources of a potential agglomeration can be located within and beyond this agglomeration [10:1]. The reasons and causes for town agglomeration are described in Russian and foreign studies and are especially relevant for countries with the most active urbanization processes (the USA, Japan, Germany, the UK) [11].

For estimating agglomeration index, foreign researchers apply a set of threshold values such as minimal population of a settlement, time for commuting to the nearest town [12:54-55]. Russian situation needs to adjust these indicators due to specifics of formation and distribution of large cities. Largest Russian cities are in the process of agglomeration and applying the term "town agglomeration" to them seems incorrect. Several Russian potential town agglomerations are located close to neighboring agglomerated territories and this may lead to competition between them.

In the 21<sup>st</sup> century, the new urbanization type led to formation of several competition levels. Urban agglomerations (global cities) are clusters of development and strive for national and international competitiveness. Town agglomerations are subjects of regional or subregional competition [2:134]. In this case, town agglomerations may compete with centers of neighboring agglomerations [13:262]. In certain cases, an internal competition may occur between two cities of the agglomeration conurbation. Describing different levels of competition needs an adequate set of tools because the agglomeration core city is a unique niche with its own competitive advantages.

The competition between town agglomerations is predominantly for labor resources. This is especially relevant for agglomerations sharing a common border. In this case, a town agglomeration tries either to protect its market share or increase it by taking advantage over its neighbor [14:795]. The competition understood as the succession of events aimed at redistribution of resources [15:20] makes it reasonable to specify the notion of spatial competition between town agglomerations.

The theory of town agglomeration assumes that the agglomeration space already exists. In other words, the agglomeration space is viewed statically. However, it is necessary to distinguish the stage of agglomeration formation when analyzing closely located agglomerations. The presence of external economies of neighboring town agglomerations is an objective driving force of agglomeration [16:935].

Thus, in comparison to competition between regions, town agglomeration competition can happen between closely located agglomerations sharing a common administrative border and objectively trying to increase their agglomeration space. The subjects of such competition are primarily core cities while its objects are mostly labor resources.

The extension of town agglomerations in Western Europe led to emergence of so-called cross-border agglomerations in the 1990s. such agglomerations exist, for example, in Basel and Zurich regions of Switzerland. The uniqueness of this situation is in strengthening of interrelations between neighboring agglomerations and the role of agglomeration core cities [13:262]. We may conclude that cross-border agglomerations are formed to compensate potential negative consequences from spatial competition.

*B. Agglomeration process in the southern part of Western Siberia*

Town agglomerations in Russia are unevenly distributed. Among 40 subjects that could possibly be called “large agglomerations” only 12 are located in the Asian part of the country. Among them 9 agglomerations are located in Western Siberia. The centers of four large regions of its southern part (Novosibirsk, Kemerovo, Tomsk Oblasts and Altai Krai). Sometimes these subjects are called “Siberian conurbation” [17]. This causes questions if these cities can be rightfully called agglomerations and if there is competition between neighboring agglomerations sharing common administrative border.

Comparison between neighboring agglomerations of southern part of Western Siberia demonstrates that agglomerations in this region have not been fully formed yet (Table 1). Moreover, different methods for describing specific agglomerations may lead to different results. In particular, one method involves estimating agglomeration development through percentage of population in satellite town. If the share of population in the external zone of town agglomeration does not exceed 25%, the agglomeration is considered to be not developed. In developed agglomerations this percentage is approximately 25-50% [18:187].

TABLE I. MAIN INDICATORS OF NOVOSIBIRSK, KUZBASS, TOMSK AND BARNaul AGGLOMERATIONS (2017)

<i>Agglomeration</i>	<i>Population/ Total regional population (thousand)</i>	<i>Urban population/ total population of the Oblast (%)</i>	<i>The number of cities/agglomeration districts</i>	<i>Oblast territory share (%)</i>	<i>Population concentration per 1 km<sup>2</sup>/ Place in Siberian Federal District</i>	<i>Share in total population of the Oblast, (%)</i>
Novosibirsk	Over 2 mln/ 2 649 900	82.5/ 78.9	3/9	9.38	14.9/2	78%
Kuzbass	2 015.4 /2708	75.7/ 84.9	20/2	33.7	29.5/1	74%
Tomsk	781.8/ 1 mln	72.5/ 69.3	2 /1	3.4	3.3/6	78.1%
Barnaul	825.5/ 2365.7	53.4/ 56.2	2/3	20	14.9/3	35%

Source: Siberian Federal District  
 URL:<http://statinfo.biz/html/M98F0S0L1.aspx> /(as of March 14, 2018)

The study reveals that by now Novosibirsk has not formed a classical developed agglomeration: two thirds of Novosibirsk Oblast populations are living in the limits of the regional center. Tomsk Oblast lacks demographic potential for agglomeration formation – its population is only 1 million people. Tomsk is the only Russian city which charter stipulates the city was founded as a scientific and research complex. Altai Krai is one of the first Russian regions that declared the formation of an agglomeration in 2009 only 35%

of the regional population lives in Barnaul agglomeration. Thus, formally, Altai Krai demonstrated better progress in forming an agglomeration but in face Kemerovo Oblast is more agglomerated. We may assume that completion of formation of neighboring agglomeration sharing common administrative border will be accompanied with spatial competition.

*C. Kuzbass agglomeration conurbation*

Agglomeration conurbations having two or more core cities are of special interest to researchers. In Russia clearly demonstrated features of an agglomeration conurbation can be found in Samara-Tolyatti and Kuzbass agglomerations.

Kemerovo Oblast differs from other administrative formations by its correlation between total area and total population. Kemerovo Oblast is the most densely populated region of the Asian part of Russia, with 28.4 people per 1 km<sup>2</sup>. This is one of the highest indicators in Siberian Federal District. Kemerovo Oblast also has a high urbanization level, with urban population comprising 84.9%.

The specifics of agglomeration process in Kemerovo Oblast, i.e. conurbation, are caused by its two historically formed center cities – Kemerovo and Novokuznetsk. Thus, a small region has two potentially agglomerative zones. This enabled us to adopt the notion of Kuzbass agglomeration that includes Kemerovo and Novokuznetsk agglomerations [19:186]. The prerequisites for Kuzbass agglomeration formation were the developed road network, available industrial relations, intensive and regular interactions and traffic between regional settlement. Only 25% of the population lives outside agglomerations in Kemerovo Oblast. In fact, we must take into account this “agglomeration shadow” – satellite towns and smaller settlements. Population of peripheral towns reduces because people move closer to agglomerations core cities and Kuzbass conurbation follows this trend.

Kemerovo is both the administrative center and the core city of the agglomeration. The specific feature of Novokuznetsk agglomeration is its combination of monocentric agglomeration and polycentric conurbation attributes. Novokuznetsk is often included in the list of largest agglomerations. This situation creates the conditions for potential competition between Kemerovo and Novokuznetsk.

Relations between two largest cities of Kuzbass agglomeration are often described as competitive. Novokuznetsk is called the “southern capital” of the region. People of Novokuznetsk consider Kemerovo to be a competitor, some even believe it does not deserve to be the administrative center. It is discussed on the local level whether to develop Novokuznetsk agglomeration as part of Kuzbass agglomeration or as a standalone agglomeration. The potential competition between two conurbation core cities is mostly related to budget financing by federal and regional authorities, attracting private investors and social bonuses and preferences capable to create new workplaces [20:192]. The main sources of labor resources for Novokuznetsk agglomeration are settlements located near the city. Kemerovo attracts resources from all over the region.

Actually, Kemerovo and Novokuznetsk complete each other as center cities. The relations between them can be described as quasicompetitive because they exist in the agglomerated regional space and constantly interact with each other. So, the only object of competition is labor resources.

Kuzbass agglomeration is heavily influenced by external competitive forces because it is located between Novosibirsk and Tomsk agglomerations. Borderline settlements of Kuzbass agglomeration can be more attracted to centers of neighboring agglomeration due to their availability. Good interregional communication is a trigger for concentration of workforce beyond the region.

Novosibirsk, Tomsk and to a certain extent Barnaul are surrounded by scientific centers requiring intellectual resources. This creates competition for the intellectual capital between neighboring agglomerations. The percentage of school graduates that left Kuzbass agglomeration to study in other regions is growing every year. As a result, this worsens the quality of local labor resources (Table 2).

TABLE II. LABOR RESOURCES OF AGGLOMERATIONS (2016.)

Agglomeration	The number of higher education institutions	Average age of the population (years)	Relative share of people with higher education employed in economy, %	Migration surplus in 2017 (thousands)
Barnaul	18	38.8	22.4	- 6 472
Kuzbass	12	38.3	23.4	- 2 615
Novosibirsk	33	38.9	25.1	15 284
Tomsk	16	37	31.2	196

Source: International Economic Statistics. Russia, Siberian Federal District URL: <http://statinfo.biz/HTML/M98F11625L1.aspx> / (as of November 1, 2018)

Kemerovo agglomeration cannot compete with neighboring agglomerations by the number of higher education institutions. The data indicate Tomsk carries out its potential as a scientific and research center (Table 3).

TABLE III THE NUMBER OF STUDENTS IN STATE HIGHER EDUCATION INSTITUTIONS (PER 10 000 PEOPLE)

Agglomeration	1995	2009	2015	2018
Barnaul	146	372	290	218
Kuzbass	132	362	247	191
Novosibirsk	282	621	426	362
Tomsk	420	827	606	549

Source. Russian regions. Social and economic indicators. 2018 [http://www.gks.ru/free\\_doc/doc\\_2018/region/reg-pok18.pdf](http://www.gks.ru/free_doc/doc_2018/region/reg-pok18.pdf) -das of February 1, 2019

**IV. CONCLUSION**

Thus, Kuzbass agglomeration conurbation is affected by several competitive forces: internal (quasicompetition between core cities) and external (neighboring emerging agglomerations trying to “capture” Kemerovo and Novokuznetsk agglomerations).

One of the ways to compensate negative consequences of potential competition between neighboring competition is to create so-called macroregions. In 2010 it was suggested to join Tomsk, Kemerovo, Novosibirsk Oblasts and Altai Krai into one microregion. The aim was to define and work on common development objectives for all four Russian Federation subjects. The space of the planned microregion is already not homogenous and is characterized by an evident tendency of centralization around the core (Novosibirsk agglomeration) attracting businesses of economic subjects and work migrants. Foreign experience demonstrates positive examples of creating cross-border agglomerations (macroregions). Geographical proximity of agglomerations could enable their autonomous strengthening or cumulative dynamic. This new Siberian agglomeration could have favorable conditions for solving common tasks thus compensating negative consequences of competition between neighboring agglomerations and within single agglomeration conurbation.

**References**

- [1] R.L. Forstall, R.P. Greene, J.B. Pick «Which are the largest? Why lists of major urban areas vary so greatly». Tijdschrift voor Economische en Sociale Geografie. Volume 100, Issue 3, 2009, pp. 277-297 DOI: 10.1111/j.1467-9663.2009.00537.x
- [2] C. Fang, D.Yu «Urban agglomeration: An evolving concept of an emerging phenomenon» Landscape and Urban Planning Volume 162, June 2017, pp.126-136 DOI: [org/10.1016/j.landurbplan.2017.02.014](https://doi.org/10.1016/j.landurbplan.2017.02.014)
- [3] T. Tabuchi « Agglomeration in World Cities». Procedia - Social and Behavioral Sciences 77, 2013. pp.299 – 307 DOI: 10.1016/j.sbspro.2013.03.088
- [4] Animitsa R., Vlasova N. Kontseptsiya gorodskikh aglomeratsiy [Town agglomerations concept]. URL: <http://group-global.org/ru/node/1596> (as of August 20, 2018)
- [5] G. R Stigler, R. Sherwin. «The extent of the market» Journal of law and Economics, vol. XXVIII. October, 1985, p.554
- [6] P. Krugman What is new about the new economic? Oxford Review of Economic Policy. vol. 14, NO. 2. 1998, pp.7-17
- [7] Porter (2000). Competition -Sph. -Moscow: Izd. Home «Williams». 608c
- [8] Zobova L., Shaabshev V. Kuzbasskaya konurbatsiya kak primer prostranstvennoy struktury gorodskoy aglomeratsii [Kuzbass conurbation as spatial structure of town agglomeration]. Vestnik Kemerovskogo gosudarstvennogo universiteta [Kemerovo State University Bulletin], No. 1-4 (61), 2015, pp. 209-212.
- [9] K. Karima «Competitiveness in urban systems. Studies on the ‘Urban Century» Available URL: [https://research.vu.nl/ws/portalfiles/portalfiles/1040737\\_\(as of September 10, 2018\)](https://research.vu.nl/ws/portalfiles/portalfiles/1040737_(as%20of%20September%2010,%202018))
- [10] N. K Kurichev, E. K. Kuricheva «Relationship of housing construction in the moscow urban agglomeration and migration to the metropolitan area» Regional Research of Russia. Vol. 8, no. 1. 2018, p. 1–15 DOI: 10.1134/S2079970518010069
- [11] M. Fujita Evolution of Spatial Economics// The Japanese Economic Review. Vol. 61, No. 1, March, 2010, pp.1-32

- [12] 2009 Report on global development for the World Bank. Moscow, Ves mir Publising house, 2009, pp. 54-55
- [13] L. Stricker, M. Baruffini «Spatial Planning and Policy Evaluation in an Urban Conurbation: a Regional Agent-Based Economic Model». *Ekonomika regiona*, 13(1), 2017, pp. 261-275, DOI: 10.17059/2017-1-24
- [14] I. Begg «Cities and competitiveness» *Urban Studies*. Vol. 36. N. 5-6, 1999, pp. 795—809
- [15] Tambovtsev V. Konkurenciya kak ekonomicheskoye blago [Competition as economic virtue] // *TERRA ECONOMICUS*. Vol. 15, No. 1, 2017, pp.16-28
- [16] E. Schoenberger, R. A. Walker «Beyond exchange and agglomeration: resource flows and city environments as wellsprings of urban growth» *Journal of Economic Geography*. Volume 17, Issue 5, 1 September 2017, pp. 935–958, DOI: org/10.1093/jeg/lbw012
- [17] Grudin M., Chistyakov P. Sibirskaya konglomeratsiya kak draiver ekonomicheskogo rosta Rossii [Siberian conurbation as a driver of Russian economic development]. 11<sup>th</sup> National Conference on Development. Novosibirsk, May 22, 2015// URL: <https://drive.google.com/file> (as of August 10, 2018)
- [18] Yarotskaya E. K voprosy o kriteriyakh identifikatsii gorodskoy aglomeratsii v usloviyakh innovatsionnogo razvitiya regionov [On criteria for identifying town agglomerations in the process of innovational regional development]. *Vestnik nauki Sibiri [Siberian Science Bulletin]*No. 5(6), 2012, pp.185-190
- [19] L. L. Zobova, V. A. Shabashev «The problem of providing food resources in urban agglomerations (the case study of the Kuzbass agglomeration)» *Foods and Raw Materials*, vol. 4, no. 1, 2016, pp. 186–196. DOI: 10.21179 / 2308-4057-2016-1-186-196
- [20] O.P. Ivanova, G.D. Antonov, V.A.Shabashev, L.L. Zobova, A.Yu. Nesterov «Formation of agro-industrial cluster on the priority social and economic development area of the mono-industry town» *Foods and Raw Materials*. T. 5. № 1. 2017, pp.192-204. DOI: 10.21179 / 2308-4057-2017-1-192-204