Study of the cities competitiveness: on the example of cities of the republic of Tatarstan

Rezeda Khabibrakhmanova, Engzhe Safina, Ilshat Safin, and Farid Abdulganiev

1 Kazan Federal University, Institute of Management, Economics and Finance, Kazan, 420008, Russia
2 Agency for the State Order of the Republic of Tatarstan, Kazan, 420021, Russia

Abstract. The article examines the socio-geographical definition of the competitiveness of a city, as well as the types of cities competitiveness. Based on the methodology for calculating the index of the city competitiveness, the competitiveness of the cities of the Republic of Tatarstan as part of the spatial system of the Russian Federation is determined. Based on the research results, the cities of the Republic of Tatarstan are ranked by the competitiveness index and by the number of specialized types of economic activity.

The relevance of cities territorial studies is due to the socio-economic, ecological role of cities in the development of countries, constituent entities of the country. Cities are becoming centers of development, which gives rise to problems of territorial imbalances in socio-economic development. Cities are differentiated on the basis of demographic, economic, social, ecological parameters of their development and functioning. Therefore, there is an inequality of cities in their attractiveness for accommodating the population and for enhancing the functioning of the business community.

There is a scientific and practical need to define such a concept as the competitiveness of cities.

Key words: city competitiveness, management of the region competitive policy, city functions, city-forming base.

1 Introduction

Analyzing the socio-economic development of the Russian Federation regions, it can be noted that the Republic of Tatarstan is among the leaders. The socio-economic position of the region is determined by relatively stable objective factors due to the geographical location and their history, as well as subjective factors that depend on the policies implemented by the federal and regional authorities in relation to the regions, and, above all, tax, budget, price and investment.

It should also be said that the socio-economic development of the region directly depends on the development of cities in the region. In this regard, the analysis of the cities competitiveness experience of Tatarstan Republic is of particular interest.
In modern economic and geographical studies, the study of effective territorial development has become a topical subject. Modern territorial development includes the diagnosis of urban settlement systems [1]. Geodemographic development of cities determines the potential for investment in the socio-economic sphere of cities and the transformation of employment [2]. Suburbanized territories represent a demographic and resource potential for urban agglomeration [3]. Economic geographers assess the socio-geographical aspects of territorial differentiation [4], determine the ways of innovative development of the subjects of the country and actualize the problem of the formation of a modern competitive specialization of the economy [5], identify the export opportunities of Russian cities in the field of education, in the world economy [6].

Due to the relevance of the country's spatial development, there is a growing scientific and practical interest in the study of cities as support centers of the territories of the constituent entities of the Russian Federation. The subject of this study is the competitiveness of the city. The purpose of the study is to define the concept and types of city competitiveness, approbation of the methodology for researching competitiveness in the cities of Tatarstan Republic (RT), identifying competitive types of economic activity in the cities of the Republic of Tatarstan.

2 Methods

\[ IC = \sqrt[5]{EI \times ILP \times ISE \times IMA \times ITI} \]

\[ EI = \frac{NEP1}{PC1\cdot \frac{NOC}{TPC}} \]

\[ ILP = \frac{C1/NEP1}{C/TP} \]
C – the total cost of shipped goods of own production, works and services performed by the cities themselves, rubles;

TP – the total population of cities, people.

The index of social and ecological well-being of the city is proposed to be calculated by the formula

\[ ISE = \frac{1}{\left( \frac{P_1}{VE_1} \right) TP / TVE} \]

Where,

P_1 – the population of the city, people;

VE_1 – the volume of emissions into the city's atmosphere, t;

TP – the total population of cities, people;

TVE – the total volume of emissions into the city's atmosphere, i.e.

The city's migration attractiveness index is proposed to be calculated using the formula

\[ IMA = \frac{NA_1}{PC_1} \cdot \frac{TNA}{TPC} \]

Where,

NA_1 – the number of arrivals to the city, people;

PC_1 – population of the city, people;

TNA – the total number of arrivals to cities, people;

TPC – the total population of cities.

The ITI territorial interaction index is proposed to be calculated on the basis of the gravitational model according to the formula

\[ ITI = \sum_{i=1}^{n} \frac{PC_i \cdot PC_n}{D_{in}} \]

Where,

i – the city for which the territorial interaction index is calculated;

n – the number of cities;

PC_i – the population of the city for which the territorial interaction index is calculated, people;

PC_n – the population of the cities in relation to which the territorial interaction of the city is being studied, people;

D_{in} – the distance between the i and n cities.

The authors also calculate the coefficients (C) of specialization of the Tatarstan Republic cities for 2020 using the formula:

\[ C = \left( \frac{P_1}{P_2} \right) / \left( \frac{P_3}{P_4} \right) \]

Where,

P_1 – the number of people employed by the type of economic activity of the city, people;

P_2 – the number of employed by the type of economic activity in the cities of the Republic of Tatarstan, people;

P_3 – population of the city, people;

P_4 – the population of the cities of the Republic of Tatarstan, people.

The type of economic activity is classified as specialized, provided that the coefficient of specialization is not less than 1. Accordingly, the city-forming base of the city is represented by types of economic activities that are aimed at serving the external region.

Cities are classified as competitive in terms of economic activity, for which the calculated specialization coefficient has a value of at least 1.
3 Results and discussion

Competitiveness of the city is the ability of the city as a territorial system to offer the population and business more advantages in comparison with other cities; this ability is formed as a result of a controlled process of city development in certain geographic, economic, social, environmental conditions at macro-, meso-, microterritorial levels.

It is proposed to consider the economic, social, ecological, economic and geographical types of the city's competitiveness.

The criterion for assessing the competitiveness of a city is proposed to consider the properties of the city, which constitute the advantages of a given city relative to other cities.

The economic competitiveness of cities depends on the city-forming base of the city, which affects the investment potential of the city, is formed by specialized types of economic activity.

The criterion of the city's economic competitiveness is the sectoral structure of the economy from the point of view of the prospects for the formation of stable and high incomes of the population, the reduction of poverty of the population and the creation of a middle class of society.

The city-forming base of the city as a criterion of the city's social competitiveness is assessed from the standpoint of opportunities for diversifying jobs and reducing unemployment, increasing the migration growth of the working-age population.

The city-forming base of the city affects the standard of living of the population, the formation of a variety of needs of the population, depending on the level of consumer demand.

The needs of the population are conditioned by such factors as the level of income and the structure of expenditures of the population, the level of prices and inflation, the level of education of the population.

The standard of living of the population is an important prerequisite and consequence of the development of the local economy, the real estate market, socio-economic development and the competitiveness of the city.

Urban competitiveness criteria include the quality of the urban living environment, the development of urban infrastructure, which influence the formation of an urban lifestyle.

The social and economic competitiveness of the city is logically interconnected with the city-forming base and specialized functions of the city, which generate high labor productivity and in their development make demands on such a development resource as an educated and qualified labor force.

The ecological competitiveness of cities means the ability of a city to develop on the basis of sustainable development principles.

The economic and geographical competitiveness of cities means advantages for the potential development of the city based on such territorial properties of the city as obtaining benefits from the economic-geographical and transit-geographical location of the city, from the location of the city relative to urban centers with intensive socio-economic development.

The relationship between the types of city competitiveness and the proposed private indexes of city competitiveness is presented in Table 1 (the “+” sign means that a certain private index is used to study this type of city competitiveness).

<table>
<thead>
<tr>
<th>Types of competitiveness</th>
<th>EI</th>
<th>ILP</th>
<th>ISE</th>
<th>IMA</th>
<th>ITI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic and geographical</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Types of city competitiveness and private indices of city competitiveness
For the purpose of practical research and taking into account the availability of initial information that allows for a comparative analysis of the cities competitiveness, we calculated the indices of the cities competitiveness in the Republic of Tatarstan (see table 2):

<table>
<thead>
<tr>
<th>Town</th>
<th>EI</th>
<th>ILP</th>
<th>ISE</th>
<th>IMA</th>
<th>ITI</th>
<th>IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazan</td>
<td>1.06</td>
<td>1.54</td>
<td>0.19</td>
<td>1.53</td>
<td>23.86</td>
<td>1.74</td>
</tr>
<tr>
<td>Almetyevsk</td>
<td>0.77</td>
<td>0.30</td>
<td>2.22</td>
<td>0.77</td>
<td>1.01</td>
<td>1.67</td>
</tr>
<tr>
<td>Bugulma</td>
<td>1.02</td>
<td>0.69</td>
<td>1.45</td>
<td>0.97</td>
<td>0.12</td>
<td>1.71</td>
</tr>
<tr>
<td>Elabuga</td>
<td>1.03</td>
<td>0.69</td>
<td>3.86</td>
<td>0.97</td>
<td>0.11</td>
<td>2.46</td>
</tr>
<tr>
<td>Zelenodolsk</td>
<td>1.02</td>
<td>0.05</td>
<td>3.42</td>
<td>0.59</td>
<td>0.15</td>
<td>1.30</td>
</tr>
<tr>
<td>Leninogorsk</td>
<td>1.03</td>
<td>0.07</td>
<td>2.59</td>
<td>0.48</td>
<td>0.08</td>
<td>1.26</td>
</tr>
<tr>
<td>Naberezhnye Chelny</td>
<td>0.99</td>
<td>3.80</td>
<td>0.76</td>
<td>0.42</td>
<td>6.81</td>
<td>2.10</td>
</tr>
<tr>
<td>Nizhnekamsk</td>
<td>0.88</td>
<td>0.79</td>
<td>1.62</td>
<td>0.38</td>
<td>1.74</td>
<td>1.70</td>
</tr>
<tr>
<td>Chistopol</td>
<td>1.03</td>
<td>1.15</td>
<td>0.67</td>
<td>0.57</td>
<td>0.07</td>
<td>1.73</td>
</tr>
</tbody>
</table>

**Summary**

In the rating of the cities of the Republic of Tatarstan in terms of the competitiveness index, the cities that have become “significant” for the development of the industry of both the Republic of Tatarstan and the Russian Federation are in the lead. Elabuga is the capital of economic zones, the center of a cluster of factories of various types of activity. Naberezhnye Chelny is the center of the cargo engineering industry of the Republic of Tatarstan, located at JSC KAMAZ. Kazan is the capital of the republic, a millionaire city of the Russian Federation, a multifunctional center, a transport hub, the third capital of the Russian Federation. The fourth place is occupied by Chistopol. In fifth place is Bugulma. Nizhnekamsk is the industrial capital of the Republic of Tatarstan, where there are many refineries, the third largest city in the Republic of Tatarstan. Almetyevsk is the capital of oil, the asset of which is formed by oil production, the fourth largest city in the Republic of Tatarstan. Zelenodolsk is the closest logistics center to Kazan, where the traffic is distributed. The last place is occupied by Leninogorsk.

From a geographical point of view, the linear system of cities in the Republic of Tatarstan stands out — this is Zelenodolsk — Kazan — Elabuga — Naberezhnye Chelny — Nizhnekamsk.

**Agglomeration processes contribute to the strengthening of territorial interaction for the population, for the subjects of the economy. It is obvious that the features of population settlement and the location of these cities are interrelated with their high competitiveness.**

The cities of Almetyevsk, Bugulma and Leninogorsk are located at a distance of 50 km; they function as support centers for the development of the middle part of the Republic of Tatarstan.

**Conclusions**

The methodology for studying the competitiveness of cities allows us to study the integral competitiveness and private types of competitiveness of cities, to carry out a comparative analysis of the competitiveness of cities, to identify problems and features.
functioning of cities in conjunction with the study of specialized types of economic activity.

References


Realization of the housing policy on the city's level