

Thoughts about the Future of Russian Cities: Evidence from Ekaterinburg

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Abstract: With the beginning of the development of spatial strategies in Russian cities, discussions on the choice of the future trajectory broke out with renewed vigor. We build our reasoning on the example of Yekaterinburg, a large Russian industrial center with a rich history. Many specialists from various fields and just the citizens took part in the public discussions of the Yekaterinburg spatial strategy. In addition, much of the discussion was concentrated on existing or prospective buildings, roads, highways. Therefore, the discussion deviated to some extent from the key point— ‘How do you see the city of the future?’

The strategic models of industrial city or logistics center are still very popular in Russia. In our opinion, the achievement of the goals of the 21st century requires fundamentally new approaches based on the knowledge generation and development of human capital. Therefore, the future of Ekaterinburg is seen as a global knowledge city, which is based on the concepts of global city and knowledge city. The latter, in turn, is an integral part of the broader theoretical frameworks of the knowledge economy and knowledge-based society. This research area is rapidly developing causing sharp discussions. At the same time, Russian cities face very serious challenges. The federal subordination of higher education institutions and scientific organizations turns them into "foreign bodies" in the regional and municipal environment; the wave of optimization of regional universities and branches of the Russian Academy of Sciences threatens to kill regional scientific identity, local scientific schools. Science concentrated in the capital cities simply cannot meet the needs of such a huge country like Russia.

The aim of our work is not the development of a final model of prospective urban development, but only defining of a certain theoretical and methodological foundation that will be used in future research. This research should answer the main question – ‘How can we create regional science-driven cities with a high level and accessibility of culture and science?’

Keywords: urban studies, knowledge city, knowledge economy, institutional configuration, urban competitiveness

1. Introduction

In 2014, Russia began the process of spatial planning, which significantly changed the theoretical and methodological approaches to the development of the territories. The *Federal Law ‘On the strategic planning in the Russian Federation’* (2014) defines a spatial development strategy as *"a strategic planning document that defines the priorities, goals and objectives of the regional development of the Russian Federation and aims to maintain the stability of the settlement system in the territory of the Russian Federation"*. The problem is that the term space is treated quite ambiguously:

- *Territory* - a certain unit of space, which includes a lot of objects and relationships between them;
- *Habitat* - a set of properties of social, economic, cultural, and natural environment;
- *Economic system* - space for the realization of entrepreneurial initiative and achieving an economic effect.

Grounding on the experience of Yekaterinburg, we can state that the development of the spatial development strategy has caused not only intense interest of the community but also a lot of arguments about the future of the city. In the public discussions of the project, many specialists from various fields and just the citizens took part (*100 thoughts about Yekaterinburg | 100MoE*, 2016). Unfortunately, the selection of opinions for further analysis and design was not entirely transparent - the selection (synthesis) criteria were not announced. In addition, much of the discussion was conducted around existing or prospective buildings, roads, highways. Therefore, the discussion deviated to some extent from the key point (in our opinion) – ‘*How do you see the city of the future?*’

Of course, this question does not have and cannot have an unambiguous answer. However, we would like to draw attention to the thesis, which we often heard recently: "Ekaterinburg, being an industrial center

throughout its history, must remain an industrial giant." We dwell on the discussion of this thesis solely because of its extremely wide spreading. However, at least environmental considerations put this idea in doubt. China's example shows that at the cost of the rapid development of industry are extreme conditions for the life of the population. Undoubtedly, China has exceptional examples of innovative development, such as the Zhongguancun Science Park, but this only speaks of the Chinese authorities' understanding of the hopelessness of the traditional industrial development model.

Ekaterinburg has a highly benefiting economic position being at the intersection of the country's major transport arteries, and this fact sometimes empowers talks about the city development model as a logistics center. Even taking into account the strategic advantages, this concept seems somewhat outdated. Often, we can observe the conflict of values within one document: for example, at the presentation of the adjusted strategy of Ekaterinburg-2035, we had to face several visions within the framework of a single document - the "creative city" and the "transport and logistics center". By any stretch of the imagination, these options can hardly be called complementary; in addition, there can be only one vision of the future (certainly determined within the framework of a democratic selection procedure), and only ways of achieving it can be different. We do not in any way claim to abandon the development of industry or logistics, but the strategic direction of development should meet the challenges of the 21st century, but not the previous century. At the same time, Russian cities face very serious challenges. The federal subordination of higher education institutions and scientific organizations turns them into "foreign bodies" in the regional and municipal environment; the wave of optimization of regional universities and branches of the Russian Academy of Sciences threatens to kill regional scientific identity, local scientific schools. Science concentrated in the metropolitan cities simply cannot meet the needs of such a huge country like Russia.

The recent work of the Institute of Economics of Ural Branch of the Russian Academy of Sciences uses a scenario approach to strategic forecasting of urban development (Lavrikova *et al.*, 2016). Eight development scenarios have been considered, i.e. the basic, inertial, and innovative scenarios have been analysed in detail. The innovative scenario assumes neoindustrialization processes in the context of high investment rates and enhanced migration. In this scenario, the question arises from the declared quantitative growth of the human factor without taking into account the qualitative aspect. This approach can lead to the decrease of nominal wages, which can only benefit the traditional sectors of the economy (not sure). To create a qualitatively new strategy, we need first-class human capital. Accepting the method of scenario planning, we just propose to shift the emphasis in the innovative scenario from the commodity production to the production of ideas. Therefore, the future of Ekaterinburg is seen as a *global knowledge city*, which is based on the concepts of global city and knowledge city. The latter, in turn, is an integral part of the broader theoretical frameworks of the knowledge economy and knowledge-based society. This research area is rapidly developing causing sharp discussions. The aim of our work is not the development of a final model of prospective urban development, but only defining of a certain theoretical and methodological foundation that will be used in future research.

2. Background

Yekaterinburg (from 1924 to 1991 - Sverdlovsk) is one of the oldest industrial centres in Russia. The city was founded in 1723 on the border of Europe and Asia in 1667 kilometres from Moscow. Now Ekaterinburg is the centre of the Sverdlovsk region and the Ural federal district. This region is the leader of Russian engineering and metallurgy. Ekaterinburg has been an industrial city throughout its history. In the Soviet period, the city grew in industrial suburbs, which gradually absorbed the environment. So, the type of city was formed that is typical for many cities of the Urals and Siberia - a city-plant. Now we are talking about the merger of Yekaterinburg with small towns within a radius of 50 km, i.e. about the Yekaterinburg agglomeration.

Yekaterinburg agglomeration is a fundamentally new project for Russia in terms of governance of agglomeration processes. The already existing agglomerations (Moscow, St. Petersburg, Nizhny Novgorod) were created according to a rigid monocentric model: the vertical axis of the power of the central city extended to the satellite cities, i.e. the administrative unit remained the same. In Yekaterinburg, the notion of "polycentric agglomeration" widespread in Europe (Lisbon, Paris, London, the Ruhr area in Germany) has been officially stated. It assumes the formation of a multilevel integrated, qualitatively new formation, the emergence of which entails a synergistic effect on its components. Realization of reasonable and consistent steps towards the agglomeration requires a clear understanding of the socioeconomic, administrative, and sociocultural tendencies of the whole as well as its elements.

Municipalities participating in the project of the Yekaterinburg agglomeration do not merge into a single administrative unit but form an equal union. Cities remain independent, but they jointly solve strategic issues. Nevertheless, it is stressed that agglomeration processes are not limited to the problems of territorial governance.

Many people call Ekaterinburg the third most important city in Russia. In part, the goal of the Yekaterinburg agglomeration project is to establish the city as a "third capital". If the project is successfully implemented, this experience can be successfully used in other regions of Russia. However, already at the design stage, there are a number of potential problems that make it difficult to implement scientifically sound ideas. First, in the Russian legislation, there is no concept of a city-agglomeration (existing agglomerations in the legal plan are simply cities). Therefore, the norms of the relations between the elements of the agglomeration, as well as the relationship between the agglomeration and external actors, will have to be built practically from scratch. Secondly, the absence of a dominant does not eliminate the need for a coordinating centre. But the main problem is that the new status cannot be achieved by the old methods. It requires something completely new, from the concept to the specific urban solutions. Against the background of the reduction of scientific institutions in Yekaterinburg, the theoretical basis of re-industrialization looks like a dead end.

3. From the Medieval City to the Global Centre

Since the late Middle Ages, cities have become centers of political and economic life. Trade flourished there, bank capital was accumulated, handicraft production developed. In the course of the industrial revolution of the 18th - early 19th centuries, the image of cities changed. Cities transformed from trade centers into manufacturing areas. By the middle 19th century, the growth of cities and production became so rapid that large industrial centers began to absorb nearby cities. Then the question of the optimal concentration of production and its economic effects was raised for the first time.

One of the first concepts of urban development belongs to Alfred Marshall (Marshall, 1890). His ideas were later developed and supplemented by Arrow (1969) and Romer (1986), the final design was given by Glaser (Glaeser, 1992). This concept is known in science as Marshall or Marshall - Arrow - Romer (MAR) concept. The core of the theory is *knowledge-spillovers* between firms as the engine of innovation. However, the external effects of knowledge-spillovers arise only under the condition of specialization, i.e. firms in the region should be one or similar industries. Due to this fact, these interactions within the industry was called the localities (specialties) or *Marshall externalities* (MAR). Marshall also identified the economies of transport costs and concentration of labor.

In the second half of the 20th century, both the nature of cities and the assessment of their role in economic development changed dramatically. Jane Jacobs argued that the city is not just an economic unit or product of socioeconomic development, but the main engine of the economy (Jacobs, 1969, 1984). The Jacobs system, unlike MAR, implies a diversified economy. Knowledge-spillovers are an exogenous factor in relation to the particular industry. At the same time, the city creates a favorable environment for the knowledge exchange and technology transfer between industries, thus urbanization becomes an important source of innovation. The city turns into a unit of the knowledge economy, and diversity becomes the main condition for fruitful innovation.

M. Porter put forward an argument similar to Jacobs that a city is a place of increased competition between subjects of the same industry, which, in the end, stimulates innovation and technological progress (Porter, 1990). Nevertheless, the issue of the relationship between innovation and the city is still disputable today (Moulaert and Sekia, 2012; Shearmur, 2012). On the other hand, there is ample evidence of the positive impact of agglomeration as a geographical cluster on economic growth (Polese, 2005). It is also clear that GNP per capita is higher in large cities (compared to the nation-wide indicators) (Polese, 2005), but the issue of causality between urban growth and economic growth remains controversial. A single opinion about what is primary is still missing.

By the end of the 20th century, the paradigm of '*global city*' had been formed (Sassen, 1991; Hill and Kim, 2000), which reflected the processes of globalization in the world economy. Classical examples of global cities are Seoul, Tokyo, New York.

4. Global Knowledge City

Ergazakis, Ergazakis, Metaxiotis, & Psarras (Ergazakis *et al.*, 2008) summarized the strategic challenges of knowledge-based development (KBD) faced by modern cities. First, it is necessary to democratize the urban environment, which will ensure the involvement of the widest possible circles in the creation, storage, dissemination, and consumption of knowledge. The availability of digital technology ('digital inclusion') should also improve the quality of life of all community members through the use of high technology. Nevertheless, it is necessary to take into account the fact that not all companies are ready to operate in a new innovative environment, therefore, the transformation processes require careful planning. The authors make an important conclusion that the existing industrial capitalist model is not sustainable.

Van Winden, Berg, Van Den, & Peter (Van Winden *et al.*, 2007) developed the theoretical framework of the knowledge city consisting of 'foundations' and development tools. The city of knowledge has a multi-layered structure: (1) a knowledge base that includes educational and scientific institutions, as well as R & D; (2) the structure of the economy, which affects the initial level of development of the knowledge city; (3) quality of life and urban public goods affect the city's ability to attract highly skilled labor force; (4) urban diversity contributes to the creative environment; (5) an accessible environment provides knowledge transfer; (6) social equity and inclusiveness minimizes social tension; (7) finally, '*scale effect*' - large knowledge cities offer more opportunities for highly qualified professionals and businesses. It is important to remember that in the case of economies of scale, the economic law of diminishing returns is relevant. There is a breaking point in which marginal costs are equal to marginal utility, after which the efficiency of further increase in the size of the city begins to fall. Determination of the optimal size of a knowledge city is a serious methodological problem that requires further research.

The main tools for the development of knowledge cities are human capital accumulating and development of the knowledge-intensive sectors of the economy. Human capital includes communication technologies, as well as creativity and culture. The second group of tools includes highly skilled labor and urban development clusters. We should note that the concept of human capital connects both groups of tools for the development of knowledge cities. Yigitcanlar, O'Connor, & Westerman (Yigitcanlar, O'Connor and Westerman, 2008) applied this concept to the analysis of the Melbourne case. In the case of Brisbane, Yigitcanlar & Velibeyoglu (Yigitcanlar and Velibeyoglu, 2008) created a concept based on the analysis of various environmental categories: (1) creative environment; (2) administrative environment; (3) business environment; (4) natural environment; (5) built environment.

We can combine these two concepts through the model of *institutional configuration*, by which we mean '*models of the interaction of institutions and their stakeholders in a specific economic space*' (Frolov, 2016). This concept considers institutionalization in the unity of interaction of subjects, i.e. categorical and relational social groups, and factors - institutions. Such an approach overcomes the artificially created break of subject-object relationships in traditional institutionalism. We understand institutions as a set of formal rules and informal constraints, as well as coercion mechanism (North, 1990). In turn, according to the type of subject-object relationship, institutions can be classified into 4 types (Frolov, 2016): *normative* - norms, rules, customs, standards, conventions, contracts, etc. (North, 1990); *functional* - status functions and routines (Nelson, 1994; Searle, 1995); *structural* - organizational forms and models of transactions (Scott, 1995); *mental* - collective representations, beliefs, stereotypes, values, cognitive schemes, etc. (Denzau and North, 1994). Institutions are exogenous to the subject but endogenous to the system as a whole. Thus, institutional configurations are spatially specific, in other words, individual for specific countries and regions. Our vision of the institutional configuration of the knowledge city is shown in Figure 1.

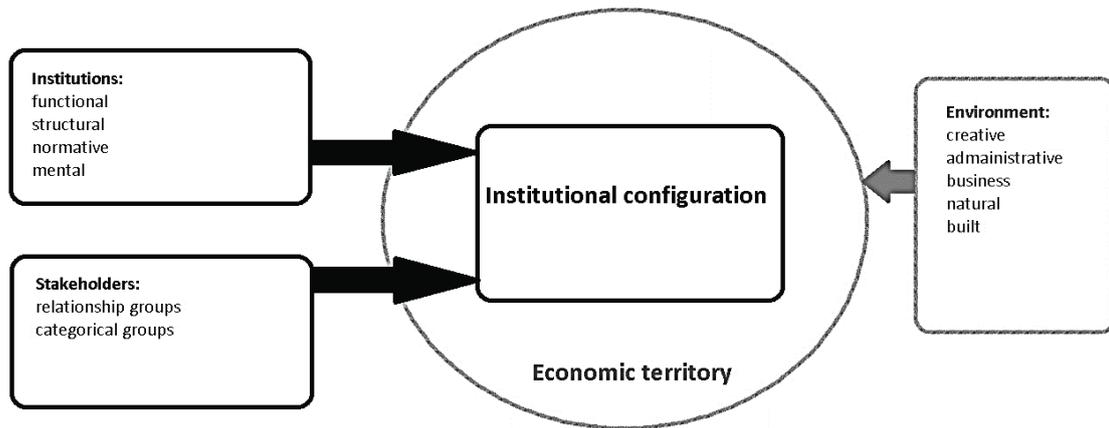


Figure 1: Institutional configuration. This model reveals the mutual influence of stakeholders, institutions, and environment.

The concept of global knowledge city does not imply a rejection of production; knowledge is also a product, and its generation can be defined in terms of the production process (Figure 2): (1) production; (2) exchange; (3) distribution; (4) consumption. In an applied respect, the process of knowledge generation can be represented as a knowledge cluster, the elements of which are: (1) human capital - training and attracting highly skilled labor force; (2) research and development; (3) creation and sale of intellectual property; (4) academic entrepreneurship; (5) creation of new high-tech industries.

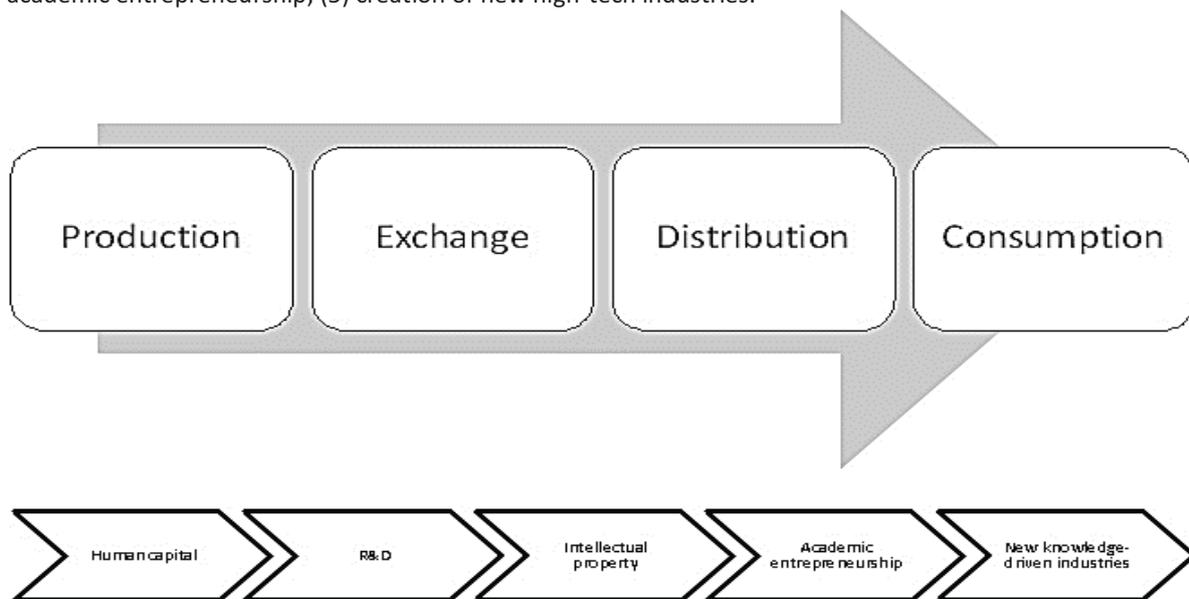


Figure 2: Knowledge cluster.

The joint application of the theoretical framework of the institutional configuration and the concept of the knowledge cluster will ensure the unity of the theoretical and applied levels of research. Regarding political decisions made on the basis of research results, it is important to note that in the course of transformation of institutions and especially transplantation of new institutions, it is necessary to take into account the current state of the institutional environment. In the opposite case, institutions can turn into alien elements within the institutional configuration.

5. Strategic Issues

The concept of knowledge-based urban development has a clearly expressed strategic aspect implying the creation of sustainable competitive advantages by urban areas. The discourse of *competitiveness* at the macroeconomic level traces back to Michael Porter. In his influential work *The Competitive Advantage of Nations* (Porter, 1990) Porter applied his concept of the strategic advantage of firms and industries to the

analysis of the competitive position of nations. He claimed that the new paradigm of competitive advantage replaced the outdated Ricardian theory of comparative advantages. Under what conditions do firms and industries achieve international success in discrete sectors and industries? The search for these conditions constitutes a national (regional, urban) strategy of competitive advantages. Porter considered productivity as the only basis for national competitiveness (Porter, 2000). Unfortunately, Porter's definitions lacked clarity, which could not but cause criticism. The main critic of Porter was Paul Krugman (Krugman, 1994, 1996).

However, the notion of competitiveness at a macro level spread very quickly in the academic community, especially among "New Regionalists" (Storper, 1997; Maskell, P., Malmberg, 1999; Malecki, 2002; Huggins, 2003). In parallel with the development of the concept of regional competitiveness, a huge amount of literature on *urban competitiveness* appeared (Lever, 1993; Cheshire and Gordon, 1995; Kresl, 1995; Ciampi, 1996; Budd, 1998; Begg, 1999, 2002; Gordon, 1999). Despite the fact that the conceptual framework of urban competitiveness was developed simultaneously with regional competitiveness, the content of the concepts is somewhat different. We can define regional competitiveness as a combination of functional specialization and economies of agglomeration that creates local assets being a subject to competition between cities (Gordon and Cheshire, 1998). Add institutions here and we will get a definition very similar to the theoretical model of the institutional configuration that we examined in the previous section.

Peter Kresl highlights six *attributes* of a highly competitive urban economy (Kresl, 1995). Besides, Kresl identifies two groups of *determinants* of urban development - quantitative and qualitative. The use of this model seems promising, but with a number of transformations. First, in order to make the model more visible, we propose to use the classical form of the input-processes-outputs (IPO) model characteristic of the process management. Secondly, determinants and indicators require specification. We tried to formulate a possible set of parameters in Table 1.

Table 1: A model of urban competitiveness.

Inputs	Processes	Outputs
– (Positive) the balance of investment cash flows	– Design of institutions	– Employment (above the national average)
– The proportion of residents with higher education (bachelor, master)	– Number of world-class scientific events (conferences, workshops)	– Growth rate (above the national average)
– The proportion of residents with scientific degrees (Ph.D., Doctor)	– Number of international and Russian events on environmental issues	– Share of innovative goods and services
– Proportion of employees engaged in research and development	– Number and size of higher education institutions	– Share of environmental-friendly goods and services
– Immigration of highly qualified specialists	– Number and size of research institutions	– Number of patents received
– Investments in infrastructure	– Number and size of corporate departments of R & D	– Share of patents registered in international patent offices (USA, European Union, Japan)
– The amount of housing built for employees engaged in research and development		– Issued licenses for the use of intellectual property
		– Number of innovative start-ups
		– Academic entrepreneurship

Undoubtedly, this model does not pretend to be final, we invite all interested readers to a discussion. Proposed scheme can be used for indicative planning of urban areas in the future.

It is important to note that no development strategy can do without strategic communications, which brings us to the topic of *city marketing*. Recently, we faced the failure of the transport reform in Ekaterinburg, which failed solely because of unsuccessful communications with the population. The subject-object relationship in this area is highly arguable. If the subject is the municipal authorities, then the question arises about the object of the action. In the case of a firm, we are talking about increasing profits as the main goal of the marketing mix, but speaking about the territories (cities, regions); the scheme will be somewhat more complicated. To clarify this issue, let's have a look at the very subject of competition - as mentioned above, this is the attraction of certain activities and accumulation of local assets. Grounding on this, the main purpose of the city's marketing plan is the attraction of investments; the main asset in our case will be human capital. Accordingly, consumers in the model will be business (existing and potential) and city residents (existing and potential) with an emphasis on attracting high-class professionals. However, the practice of Russian activities suggests that the model lacks an important element - the authorities of higher levels. In the conditions of the redistribution

economy, a significant part of the resources comes through the state financing channels; besides, administrative resource (also an extremely important asset) depends on the regional and federal authorities. Therefore, planning of strategic marketing communications should be conducted in three main areas: business, residents (community), and higher authorities.

6. Conclusions

The process of planning of spatial development strategies that began in Russia has provoked heated discussions about the future of Russian cities. We had the opportunity to observe this process during the discussion of the strategy of spatial development of Ekaterinburg. We are concerned about the fact that most often the discussion reduced to specific architectural solutions. At the same time, the prospective development of old industrial cities in the 21st century requires fundamentally new approaches and paradigms. The aim of the work was not searching for exhaustive answers to questions about the development direction of Russian cities (and not only Russian ones). We made an attempt to develop a consistent theoretical and methodological foundation, on which further theoretical and applied research will be based.

As a new paradigm of urban development, we propose a theoretical framework of global knowledge city that integrates the concept of knowledge city and the phenomenon of a global city. Recently, a significant amount of theoretical and methodological approaches to the analysis of the knowledge cities has been accumulated. In our opinion, now there is a need to systematize disparate concepts. As a means of systematization, we propose using the model of institutional configuration at the theoretical level and the concept of knowledge cluster for applied research. In the future, we plan to study the cases of knowledge cities and develop recommendations for economic policy on this theoretical foundation.

Does the development paradigm of the city affect spatial development and architectural solutions? In our opinion, certainly, affects. The image of the future influences the identification of places of attraction and nodes of the transport infrastructure. With reference to the industrial city, these will be industrial enterprises, to the logistics center-warehouse terminals, to the city-museum - sights, and monuments of art. For the knowledge city, the key points on the urban plan should be centers of knowledge generation. It can be universities, or research institutions, or libraries, or centers of collective creativity. The very atmosphere of the city should contribute to creation.

Recently, several innovation centers have appeared on the map of Russia - Kazan, Ekaterinburg, and Tomsk. Nevertheless, Russian cities lack globalization (in a good sense of the word). The mobility of intellectual workers, knowledge exchange with the largest foreign scientific centers is what will enable the strategies of Russian regional centers to reach a fundamentally new level of development. In addition, the most important task is the creation of the comfortable environment for professionals involved in the process of knowledge generation. As an example, we can cite the idea of the creation of small '*science towns*' within urban agglomerations, where people will not only live but also generate new ideas through the atmosphere of creativity. Improvement of the quality of the urban environment is able not only to attract leading specialists from abroad but also stop the '*brain drain*' that has been continuing in Russia since the beginning of the 1990s. The breeding ground for creativity is culture. Best practices of federal centres like Moscow and St. Petersburg should be transferred to major regional centres. The emergence of regional science-driven cities with a high level and accessibility of culture is a real opportunity for the emergence of the '*Lomonosovs*¹' of the 21st century. Besides, having received an education in a regional centre, they will not cling to the capitals by hook or by crook; they will contribute to the rise of Russian province, which has been always rich in talents.

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¹ Lomonosov is the famous Russian scientist of the 18th century, who came to the capital from the countryside on foot to study science.

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