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Urbanization and Economic Development in Russia

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Abstract

The paper studies trends in the urbanization in Russia, discusses advantages and disadvantages of the urbanization to the economic development and provides empirical analysis of the relationship between the economic growth and the urbanization in Russian regions. The results show that Russian economy has not exhausted the resources of the urbanization; however the effect of large cities is not big.

Keywords: urbanization, economic development, Russian regions, empirical estimates.

The spatial organization of economic activity is an important factor influencing the growth, efficiency and structure of the development. Global trend of the development is the increasing role of cities, urbanization is a phenomenon of all countries in the world and is characterized by, firstly, the rapid increase in urban population and, secondly, the rapid growth of large cities. 13% of the world's population lived in urban areas in 1900, in 1950 - 29%, in 1990 - 46% and in 2010 - over 50%. At the beginning of 20th century there were 10 cities in the world where population exceeded one million people; in 2000 this number reached 400. In the most developed countries, the share of urban population is 75-80%, and the proportion is stable in recent years. In developing countries the share of city dwellers - much lower, but the growth rate of urban population is higher. Changing of the system of settlement in favor of the cities has become a significant feature of the economic dynamics of the most of the world.

Urbanization: resources and constraints of the development

"State of the World's Cities 2010/2011" UN-HABITAT reports that the rates of economic growth and urbanization levels have a positive correlation. In another issue of this organization (Urban World, 2010) one of the graphs shows that productivity in the biggest cities of the world is significantly higher than the national average. This statistics suggests that urbanization can stimulate economic growth.

The theory proposes a number of sources of benefits that are associated with urbanization, they are both on the side of consumers and on the producers' one. A city is a spatial concentration of population and labor force and, consequently, it increases the number of different consumer markets and related specialized industries. Propensity of consumers to the diversity means that city offering a greater variety of goods and productive resources increases the utility of the consumers. Accordingly, the growth in size of the settlement is associated with growth of consumer welfare.

Producers decrease cost due to the closeness of counterparties provided by the localization of economic activity in a city. Lower transport and transaction costs make it possible to reduce prices, to redirect resources at investment and to the expansion on the new markets. There are goods which can be produced in metropolitan areas only; in this case the production is profitable when significant demand is concentrated in a compact area. Thus, the close location of producers

and consumers reduces overall costs, contributes to the effectiveness and creates additional opportunities to expand the size of and to create new markets.

Trend of the modern development is deepening the specialization and greater dependence on contractors. Active communication between the enterprises in the cities contributes to the establishing clusters and networks which can eliminate the negative effects of intra-industry competition and reduce the risk of inter-firm cooperation. The industrial clusters also give the flexibility in sharing common resources and in reducing operating costs, provide access to a range of specialized infrastructure and service.

A city offers opportunities for more efficient use of industrial and social infrastructure, which are generally public goods. Increasing the number of users makes it more profitable and diverse, and reduction of the individual cost stimulates the development. The result is a higher quality of life compared with the peripheral nonurban areas. This is reflected in a more developed system of transport and communications, health and education, culture and leisure industry in cities. Reducing the cost of infrastructure services due to higher population density makes them available, creating additional opportunities for development of human capital and business.

The key factors of modern development are innovations, information and knowledge. The concentration of economic, financial, administrative and human resources improves the conditions for an active exchange of business information, for creation and dissemination of inventions. Innovations are increasingly stimulated by the interactions between different sectors, rather than between firms of the same industry. Therefore, cities are not only more effective, they have advantages in terms of creation and introduction of new ideas and technologies, thus providing impetus to the dynamics of development and to the productivity growth. Innovative development makes special demand for education and science infrastructure. Knowledge, its accessibility and intellectual capital generating innovations have become important factors in improving performance and extending range of new products. Cities are the places of concentration of higher education and academic research, and the leaders in this area are the biggest cities. Urban infrastructure offers business and institution platforms for the development, its elements are business parks, business incubators, etc. They contribute to the diffusion of innovations; they reduce production cost and period of technological adjustments. However, there is a limitation, which is that the value of innovation is reducing while knowledge is spreading rapidly among other firms.

Cities are characterized by more advanced and flexible labor market, and, the larger the city, the greater its capacity to meet demand from the business. Modern technologies have requirements not only for size, but also to the structure, quality and qualification, and the weight of the contribution of human capital in the dynamics and characteristics of economic development is constantly increasing. Qualification characteristics of regional labor market affect the type of the located production, the abilities to generate and to perceive innovations. The level of education, age and social structure of the population also determine the inclination and ability to entrepreneurship, business culture. Cities benefit significantly compared to the rural settlements of these characteristics. There is a feedback, urban population has a wider range of choice of employment and the theory of consumer behavior interprets this extension as an increase in individual utility. Personal skills and abilities receive the possibility of an adequate application and the most efficient usage in the industrial sector.

The concentration and diversity of resources in urban and metropolitan areas offer opportunities of economies of scale, large market and a combination of factors of production, but under certain conditions, the rapid growth of urban settlements is accompanied by negative consequences. The limits of urbanization are given by resource constraints. Under conditions of high rates of extensive development cities generate increasing demand and a particularly high burden on the non-transportable factors of production: land and water. Shortage of land leads to its high price and congestion. Water pollution also imposes costs connecting with creation of sanitation systems, sewage disposal and sustainable water supply.

Cities suffer from environmental degradation and pollutions. The population of large cities is far from the nature and green areas, the preservation of which is difficult due to the shortage of land. However in the modern world the environment and local resources become more and more serious restrictions for the economic activity.

One of the most acute problems of large cities is the transport infrastructure. The concentration of auto transport in the cities is increasing, while the solutions of the problem lag behind and require significant resources. As a result, the time of traveling within the cities to the place of work or study, which generally is non-productive, is very high. Urban residents are also at increased risk of accidents and fatalities.

The reverse side of concentration of economic activity and high population density in cities is reduction of housing affordability and overcrowding of residence, what reduces the attractiveness and quality of life in the cities, and sometimes provokes a crime.

It is statistically confirmed that an increase in overall well-being of the population of large cities is associated with a sharp income inequality and with growth in absolute and relative poverty. This leads to an accumulation of discontent, to social conflicts what is a brake on economic development. The reasons for the slowdown are, firstly, the need for large-scale redistribution, causing a net loss for society. Secondly, poor people have limited opportunities for education, loans to business, resulting in the underutilized potential of this category of the population, all these negatively affects the productivity of the economy and its growth rate. Thirdly, conflict resolution and achieving balance in society require additional resources that are spent unproductively, what reduces the overall efficiency of the economic system.

Another argument in favor of the conflicting influences of urbanization on overall economic growth is the fact that urban development is not only due to internal resources, but to a greater extent due to external sources. Migration from villages and small towns, the concentration of business and accumulation of financial resources and investment in major cities can lead to high inter-regional inequality, the emergence of stagnant and depressed areas, of the “economic deserts” around cities.

An impact of urban life on the social capital in society is also ambiguous. On the one hand, the small size of the settlement, isolation, lack of alternatives and the static relationships, strong social ties force to fulfill the commitments and made reputation mechanism effective. At the same time in the large and dynamic societies, relationships are anonymous, informal norms and rules are less effective. These considerations bring to the conclusion that urbanization does not help to build trust, harmony and cohesion. But there are counterarguments, advanced education culture and communication infrastructure provide opportunities for active purposeful interactions and form a range of social networks, all this is an argument in favor of the development of social

capital. Obviously, the result of the combination of the positive and negative effects depends on the society, its culture, stage of the development and on national values and norms.

If we consider the case of Russia, urbanization can be attributed to factors that positively influence the development of social capital. This conclusion is based on estimates of the correlation of various indicators of the level of trust, harmony and cohesion in the country, on the one hand, and the share of urban population in Russia's regions on the other hand (Table 1).

Table 1. Regression of indicators of development of social capital in Russian regions on the level of urbanization

Indicator of social capital	Share of urban population
Most people can be trusted	0,104*
Dealing with people you should be careful	-0,160**
In our country harmony and cohesion dominate among people	0,121*
In our country disagreement and disunity dominate among people	-0,183*
Among the inner circle of people harmony and cohesion dominate	0,024**
Among the inner circle of people disagreement and disunity dominate	-0,0280***

Sources: GeoRating of Public Opinion Foundation and the Federal State Statistics Service of the Russian Federation; the sample includes data on 2007 on 63 Russian regions.

The effects of urbanization on economic development are ambiguous and depend on the stages and features of the country's development, on a network of spatial relations, its density and structure, and on the functions of cities. As a result, despite the presence of some universal characteristics, a combination of benefits and costs of urbanization in each country has its own specifics.

Empirical estimates of the effects of urbanization

Global estimates

The idea that cities as sources of economic growth has been formulated Jane Jacobs (Jacobs, 1969) and this hypothesis was tested on different databases. The rapid growth of urban population gives a new impetus to studies of urbanization. In 2008, more than half of the world's population lived in urban areas already, by 2030 the urban population is expected to increase to 5 billion, and the cities in developing countries will include 81% of the world's urban population (Urban World, 2010).

According to the estimates (Henderson, Nijkamp, Thisse, Mills, Cheshire, 2004) 38 largest cities in the European Union in 2000 held only 0.6% of the total territory, but had accumulated about 25% of the population and approximately 30% of GDP. In Japan, the central region, comprising 5 prefectures in 1998, held only 5.2% of the land, but 33% of the population and produced 42% of GDP. In the United States in 1997, 53% of the population lived in 40 major cities.

One of the literature reviews (Rosenthal, Strange, 2004) concludes that double increase in the size of cities will elevate the productivity of firms in different countries by 3 to 8 percent. Another study (Melo, Graham, Noland, 2009) reports that for China, Japan and Sweden the rate of return is less than for the United States and France. Nakamura (Nakamura, 1985), making the estimates for Japan, came to the conclusion that the double increase of urban population leads to an increase in productivity by 3.4%. Ciccone and Hall (Ciccone, Hall, 1996) found a positive effect of population density on productivity in the U.S., they reported that a doubling of the city's population will increase productivity by 6%. In another study Ciccone (Ciccone, 2002) presented the results of estimates for France, Germany, Italy, Spain and the UK, in accordance with them a doubling of the urban population will increase productivity by 4.5%.

The results of the similar estimation for Eastern Europe and Central Asia show that the average effect of agglomeration is higher than in OECD countries. The estimates using data on 1992 – 2003 for the Hungarian enterprises came to the conclusion that a doubling the size of the cities would give rise of factors' productivity by 16% (Békés, Harasztosi, 2010), this indicator is 2 times greater than one for OECD countries. The estimates of agglomeration effects for Ukrainian companies received by Vakhitov (Vakhitov, 2010) also are significantly higher than those presented in the review of Rosenthal and Strange. The contribution of population density in productivity growth in Europe increased steadily in 1980 and 2003, and this was mainly due to the Eastern European countries.

Russian studies

Foreign studies of urbanization in Russia are traditionally held by political scientists and geographers. They proceed from the postulate of the irrational spatial distribution of the production as a result of the socialist planning, restrictions on migration to the cities and Gulag system. These arguments brought to two conclusions, firstly, the "overcrowding" of the northern and eastern regions of Russia and the fallacy of setting up cities there, and, secondly, the artificially low urbanization in the European part of the country (Hill, Gaddy, 2003). The statement of the irrationality of the urban settlements in the Soviet period suggests a strengthening inter-regional migration in the transition period in Russia. However this prediction has not come true.

One of the proposed reasons of the slow transition to the market equilibrium is that the command economy imposed restrictions on migration to large cities, and, conversely, encouraged it into the middle ones. In addition, despite the fact that the fall of communism lifted formal restrictions on internal migration the economic and political factors that hinder the active movement of the population remain (White, 2007). Weak housing market also limited the migration. After the reforms the housing market has been liberalized, but the legacy of housing shortage and monopolization of the construction market significantly distort the market structure, it is far from the competitive one. The shortcomings of the reforms, insufficiently protected property rights, lack of information on land ownership and on the housing market led to significant transaction costs and poor investment climate that deterred investment in domestic real estate market (Buckley, Gurenko, 1998).

In Russia problems of urbanization are studied by geographers and economists. Lappo stated that agglomeration process in Russia is artificially retarded (Lappo, Polyansky, 1999). Tretyakov and Nefedova confirmed the hypothesis of differential urbanization on major regions of Russia

(Nefedova, Treyvish, 2002). Zayonchkovskaya and Nozdrina evaluated the migration mobility of the population and area of the attractiveness of major cities using case studies (Zayonchkovskaya, Nozdrina, 2008). Lexin studies the economic problems of cities based on municipal statistics, in one of the recent paper he pointed out at abnormally high, in his view, concentration of economic and social activity in the administrative centers of the Russian Federation and in a few large cities. He considers the concentration of the administrative resources in the "regional capitals" as an additional factor aggravating regional inequalities (Lexin, 2006, 2009). Zubarevich analyzes the dynamics of economic development of cities, using the data on the weight of the cities in the regions (Zubarevich, 2006). The team of authors from the Institute of Economic Forecasting RAS presented an analysis of the main characteristics and problems of Russian cities in last decade (Belkin et al, 2011).

This paper contributes to the study of urbanization in Russia and provides estimates of the influence of the concentration of economic activity in cities on the performance of the Russian regions.

Trends in urbanization in Russia

Russia can be attributed to a country with a high level of urbanization. According to the national census conducted in October 2010, the share of urban population in the country in 2010 amounted to 73.7%. In the world as a whole the urban population reached 50% only in 2008, in Russia this level was recorded in the late 50s of the last century. Naturally, the rate of urbanization in Russia has gradually decreased and reached stabilization. Russian urban population reached 73% in 1990 and fluctuates around this level past 20 years.

The change of the urban population in Russia is influenced by three factors: natality, migration and the administrative reforms. The latter is the establishing of new urban settlements and transformation of rural settlements into urban or vice versa.

Starting in 1992, the low birth rate has become a major factor in reducing the number of urban residents. Immigration from cities was observed in 1991-1992 and it exacerbated the decline of the urban population of Russia (Figure 1).

The administrative reorganizations had significant impact on the official statistical data on the urban population in Russia, especially in 1991, 1992, 1999, and 2004. Transformation of the urban settlements into the rural ones was particularly extensive in these years (Fig. 1). One of the reasons for such administrative decisions was that the transition processes in the country have changed the direction of the migration flows. As a result part of the urban settlements rapidly lost population, what caused changing their status or even termination. The ongoing reform of local governments also played a role and led to the establishing new municipalities or uniting several settlements. Continued transformation of small cities (population ranges from 5 to 10 thousand people, but not more than 50 thousand people) into rural settlements and their incorporation into the larger urban settlements resulted in the reducing the number of small cities, although number of middle and big cities was growing (Figure 2).

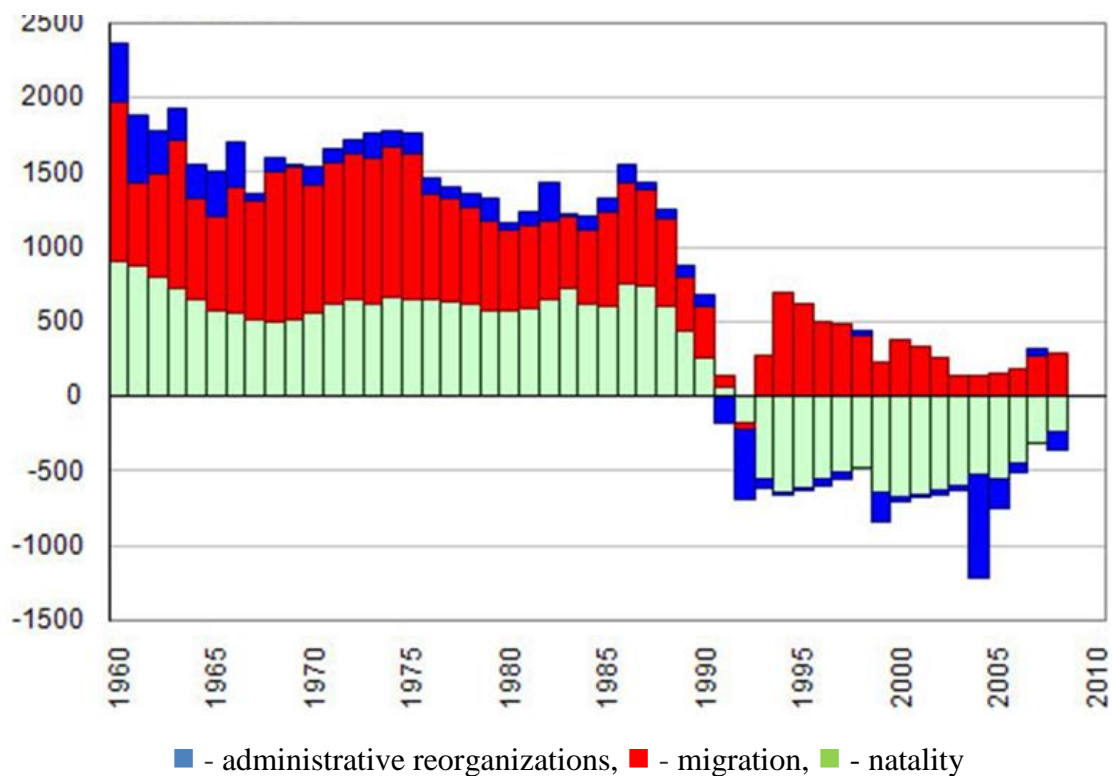


Figure 1. Components of the change in urban population in Russia, 1960-2010 years, thousands of people (Source: Shcherbakova E, 2010)

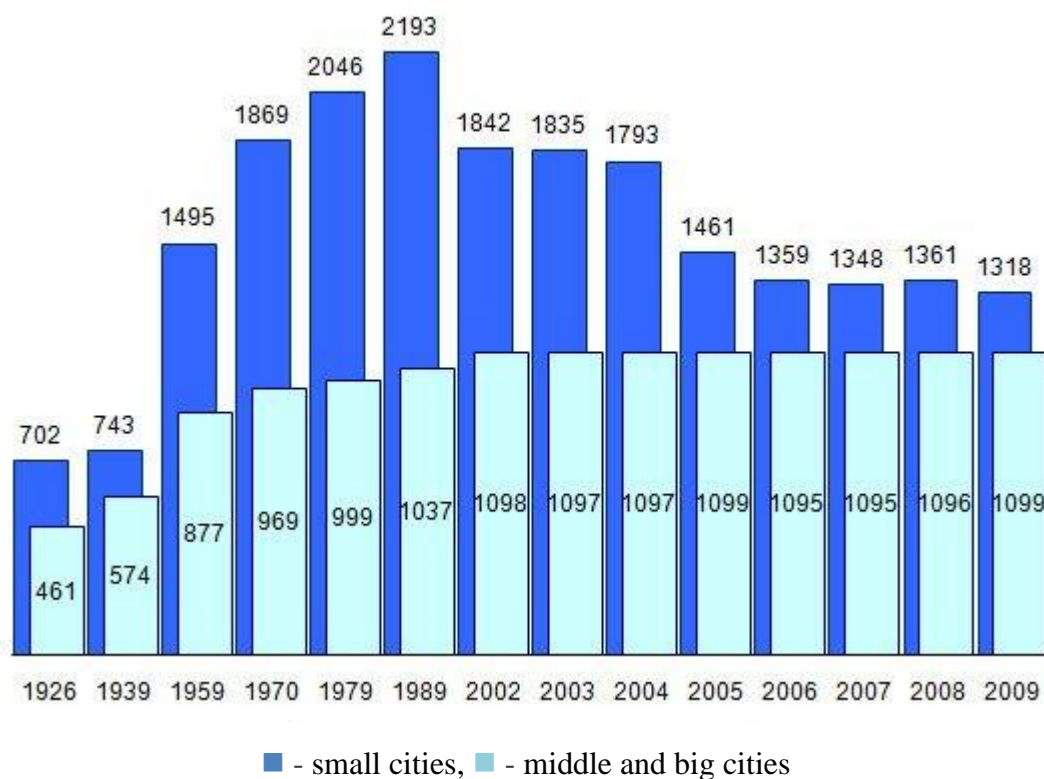


Figure 2. Number of urban settlements in Russian Federation (Source: Shcherbakova E, 2010)

In 1990-2010 share of urban population in Russia decreased by 0.5% and in absolute terms the urban population declined by 5 million people. The decrease of urban population in those years

resulted largely from the reducing the number of small cities and people living in them (Figure 3). The number of small cities in 1990 decreased by 332 units, while a number of middle and big cities during this period increased by 54. The influence of the administrative decisions makes indicator of the share of urban population in Russia less reliable characteristics of the urbanization process, it not always accurately reflects the dynamics of settlement networks, although it is important and the most frequently used in the literature.

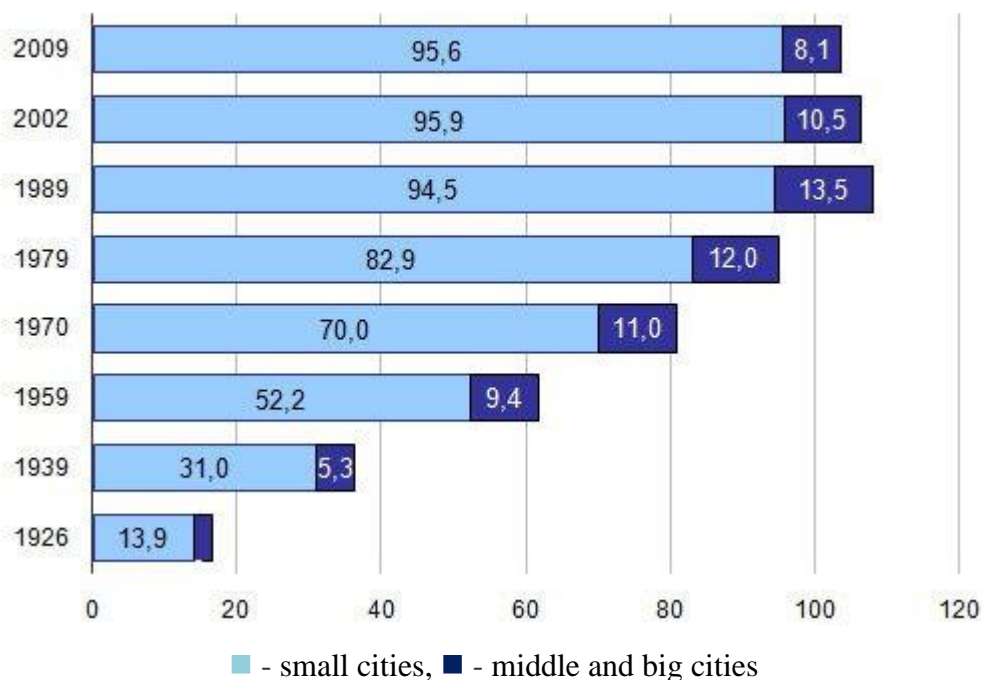


Figure 3. Structure of the urban settlements in Russia, 1926-2009, millions of people
(Source: Shcherbakova E, 2010)

In 2010 87% of Russian cities had population less than 50 thousand people, but nearly 66% of the urban population was concentrated in large cities where population amounted 100,000 or more, and about 25% of the urban population lived in cities - millionaires.

Among the Russian cities Moscow is the biggest one, the number of people in the capital exceeds 10.5 million, and St. Petersburg (the second largest city) has more than 4.6 million inhabitants. The urban population, concentrated in cities - millionaires increased in 1989-2002 from 23.3% to 25.8%. However by 2010 it decreased to 24.8%; Perm and Volgograd due to the reduction of the population returned to the group of cities having population less than 1 million people. However, the proportion of people living in the big cities having more than 100 thousand people rose from 62.4% in 1989 to 65.8% in 2010. The share of people living in big cities remained rather stable - around 71% (Table 2).

Russian regions differ significantly in urbanization, both at the macroeconomic level and the subnational one. Among the macroeconomic regions the Northwestern (83.5) and the Central (81.3) have a high proportion of urban population, the minimum rates of urbanization have the North Caucasian (49.1) and the Southern (62.4) Federal Districts. At the subnational level the lowest share of urban population is typical for the national republics: Altai (27.6%), Chechnya (35.0%), Ingushetia (38.3%), Karachaevo-Cherkessia (42.3%), Dagestan (45.3 %), Kalmykia (44.1%), and Tuva (53.1%). Naturally, such jurisdictions as Moscow and St. Petersburg have the highest percentage of the urban population - 100%.

Table 2. The distribution of urban population in Russia among the cities of different sizes, %

	1926	1939	1959	1970	1979	1989	2002	2010
Up to 20 thousand people	20,7	9,6	8,7	6,7	5,2	4,6	5,2	5,3
20 - 49,9 thousand people	14,6	18,0	17,6	15,5	13,2	12,3	12,1	12
50 - 99,9 thousand people	18,4	13,2	12,9	11,3	11,2	11,8	11,6	11,4
100 - 499,9 thousand people	20,2	32,5	29,6	33,3	32,3	29,8	29,6	28,3
500 - 999,9 thousand people	-	3,7	15,9	12,0	15,3	14,9	12,9	16,1
1000 thousand people and more	26,1	23,0	15,2	21,2	22,8	26,6	28,6	26,9

Source: the Federal State Statistics Service of the Russian Federation

Urbanization and economic growth in Russian regions

Model specification and data

There are arguments for and against the positive impact of urbanization on economic development. Because of the significant role of agglomeration effects we also have to take into account not only the level but also the structure of the urbanization.

The basic idea of econometric estimates is to expand a production function $Q = AF(K, L)$ including urbanization level and its structure $Q = AF(K, L, U, S)$. Where A is total factor productivity, F – stock of private capital, L – labor force, U – urbanization level and S – indicator of agglomeration capacity. The regional urbanization level is measured by the share of urban population in a region; to characterize the capacity to generate agglomeration effects an average size of cities in a region is taken.

Russian regions differ essentially in the territory and in the economic activity. To eliminate effect of and correlation with the scale and to make the sample comparable across the regions a transformation of the initial data was done; gross regional product per capita and stock of capital per capita are used. The source for the data is official annual reports of the Federal State Statistics Service “Regions of Russia”. We use annual data for 79 Russian regions - subjects of Russian Federation. Covered period is 2000 – 2008 so data has panel structure. This period of time is characterized by macroeconomic stability and sustainable growth in Russia, this fact eliminates problem of accounting an impact of external and macroeconomic shocks.

Analysis of the scatterplot where share of urban population is plotted against gross regional product per capita (Figure 4) brings to the conclusion that a nonlinear dependence between the level of urbanization and economic productivity exists. Probably an inverted parabola combined with a positive slope can be used for the specification of the model. The comparison of size of urban settlement against regional productivity shows that we observe rather a linear relationship (Figure 5).

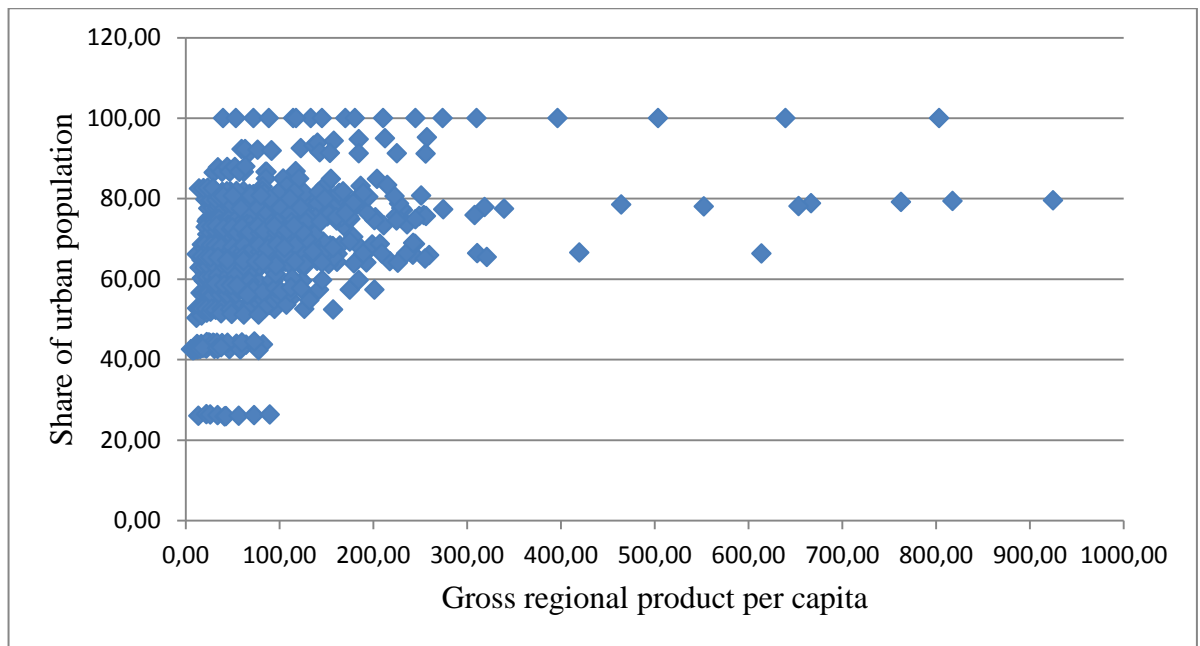


Figure 4. GDP per capita and share of urban population in Russian regions

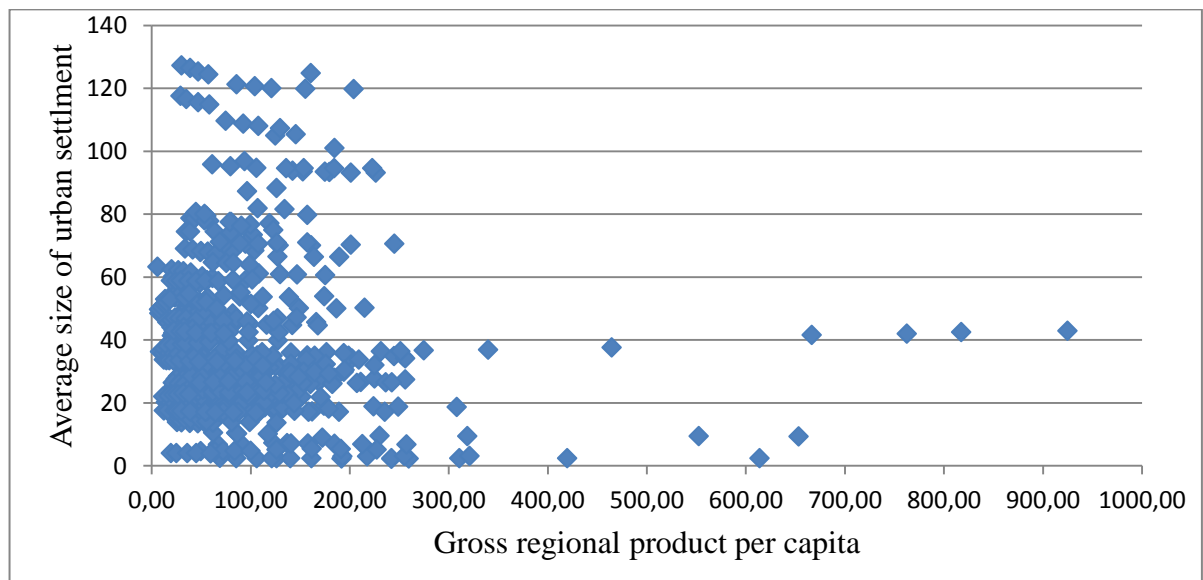


Figure 5. GDP per capita and average size of urban settlements in Russian regions

Thus, the specification of the estimated model is as follows:

$$\frac{Q}{L} = A + b \frac{K}{L} + c_1 U + c_2 U^2 + dS + \mu + \varepsilon, \quad \varepsilon \sim N(0, \sigma^2 I)$$

Here μ is variable of the fixed regional effects.

Tested hypotheses are the following:

Hypothesis 1. Urbanization stimulates growth of regional productivity in Russia. This hypothesis implies that the coefficient c_1 is positive and statistically significant.

Hypothesis 2. The positive effect of urbanization on the regional productivity in Russia is decreasing and at some level becomes an impeding factor. This hypothesis implies that the coefficient c_2 is negative and statistically significant.

Hypothesis 3. Large cities demonstrate higher performance and create positive externalities for the overall regional development. Confirmation of this hypothesis requires coefficient d to be positive and statistically significant.

The estimation results

The estimation method of the model was least squares one with fixed regional effects. The second moments of the error showed correspondence to the classical assumptions about the stochastic structure of the model. The results of the estimates are presented in Table 3.

Table 3. Results of the model estimates

Variable	Coefficient	Standard error	P-value
Constant	-509,2	261,2	0,052
Stock of capital	0,443	0,007	0,000
Share of urban population	21,02	7,038	0,003
The square of share of urban population	-0,195	0,047	0,000
Average size of cities	0,013	0,002	0,000
Number of the observations	711		
Number of the regions	79		
R^2_{within}	0,89		

The estimates confirm the tested hypotheses. The increase of share of urban population in the country by 1%, i.e. from 73.7% to 74.7% will increase the average regional productivity by 8%. However, the effect of urbanization is reducing; it follows from the negative sign in the square of urban population. The increase of a city size per 1 thousand residents would increase economic productivity by 0.1% only.

Thus, our analysis shows that despite the high level of urbanization in Russia and a number of negative effects of the concentration of resources in cities, the resources of urbanization are not exhausted. Cities develop effectively creating positive externalities and growth impulses on surrounding areas. The potential of changes in the structure of urban settlements in favor of large cities exists, but it is very small. Obviously, we should agree with the authors and politicians who are calling for active management of urban development through the support for the agglomerations networking with small and medium cities.

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