SCIENTIFIC REVIEW

World Urbanization Prospects and the Problem of Its Infrastructural Provision

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ABSTRACT – *This article describes world urbanization prospects, discovers some peculiarities of city growth in different regions, and makes the analysis of dependencies in economic growth and infrastructure investments. As a result, considerable discrepancies in urbanization process and its infrastructure provision are revealed, and new sources of finance for solution of this problem are offered.*

KEY WORDS: *infrastructure, urbanization, capital investment, infrastructural fundraising*

Introduction

Population and its spatial distribution are the matter of particular importance in the strategic decision-making at the state and the supranational level, because these determine the structure and dynamics of resources consumption. The process of urban growth, associated with the formation of early states, has started in the IV - early III millennium BC [Modelski, Devezas and Thompson, 2008]. However, today the academic and practical researches are focused on the processes of XX - XXI centuries, which some authors describe as mega urbanization [Firman, 2009; Taubenböck, 2011]. In the recent years, one can observe a shift of urbanization paradigm. Previously it was considered as a problem for development; now the scientific community and policy makers understand the inevitability of urbanization and perceive it as the engine of economic growth [The World Bank, 2009].

The purpose of this paper is to study world prospects and some regional differences in urbanization processes, to identify problems of infrastructure provision and to suggest some solutions.

Trends and projections of global urbanization

The main organizations that study population growth in the most of the world's countries are the United Nations, the World Bank, and the United States Census Bureau, all of which use the deterministic approach. However, for planning purposes probabilistic projections are useful. The most common approach to contending uncertainty in population

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projections is the scenario, or high-medium-low approach. Other approaches to producing probabilistic population projections include ex-post analysis, time series methods, and expert-based approaches. The Bayesian hierarchical model is about to assess the uncertainty of the range of possible future outcomes based on the country's current situation and past trend [Adrian E. Raftery, Nan Li, Hana Ševčíkovác, Patrick Gerland, Gerhard K. Heilig, 2012].

According to the UN forecasts until 2050, urbanization will occur mainly in the less developed countries (all regions of Africa, Asia (excluding Japan), Latin America, the Caribbean, Melanesia, Micronesia and Polynesia). At the same time, the population of urban areas of Africa and Asia by the year 2050 will not exceed 65%. As it is now, the most urbanized areas will be North America (88.6%), Latin America and the Caribbean (86.6%), Europe (82.2%). In general, the part of the urban population of the planet will be 67.2% [The UN, 2011].

The UN projections of the proportion urban in 2050 tend to be slightly higher than the preliminary projections by the Bayesian urban projection model, but this method is appropriate to use when studying certain country forecast, which gives more specified results [Alkema, Gerland and Buettner, 2011].

According to the World Bank, urban population is projected to reach 5 billion by 2030; fully two-thirds of the world's population will then be urban. Ninety percent of this growth is taking place in developing countries. Around 5 million people migrate every month to cities in developing countries, in search of jobs and better access to services [The World Bank, 2009].

Urban growth is highly concentrated in a few hundreds cities and will continue to be. Mc Kinsey Global Institute suggests that just the top 600 cities will contribute nearly 65% to global GDP growth in the period till 2025. In 2012, 20% of world's population reside in these cities. According to mentioned forecasts, another 440 cities in the developing countries will deliver 47% of global economic growth in estimated period [Mc Kinsey Global Institute, 2012].

It should be noted that the definition of urban area is a fundamental problem for urbanization research. There is no global standard for urban environments. The definition of urban area varies among countries and sometimes it even varies over time within a single country. In the UN methodology a number of inhabitants is the main indicator of urban territory (it can vary from 200 to 20 000 people in different states). In many countries other criteria are also taken into consideration in statistical surveys: population density (Canada, USA), municipality (Hungary, Spain, Finland), primarily employment in non-agricultural sectors (Armenia, Azerbaijan, Georgia, Lithuania, Moldova, Poland, Russia, Ukraine), distance between dwellings (France, Romania, Sweden) [The UN, 2011]. Mc Kinsey Global Institute defines cities as broad metropolitan areas integrated into a connected urban region that include 150,000 or more inhabitants in developed regions and 200,000 or more inhabitants in developing regions [Mc Kinsey Global Institute, 2012].

All mentioned additional factors, which are taken into account in determining the urban settlement, are associated with certain infrastructure, that lets distinguish urban and rural areas.

Economic sense of infrastructure is ambiguous and has changed during years. The majority of sources point out that this notion came to economic literature from military terminology in 40-s of XX century. The notion of infrastructure was getting wider alongside with development of new technologies, scientific and technological progress and production growth.

All definitions of infrastructure can be divided into two groups. On one hand, infrastructure is the set of service systems to maintain production and life support. Other notions emphasize on the role of infrastructure as a set of institutions which support all economic activities.

In our opinion, these two definitions can be combined and infrastructure can be defined as the system of institutions and organizations which are to create conditions for production and distribution of goods and sustain human life activities.

These two groups of definitions reflect classification of infrastructure into soft and hard infrastructure, which is widely spread in western economic publications. Hard infrastructure is limited to capital assets that serve the function of conveyance or channelling of people, vehicles, fluids, energy, or information, and which take the form either of a network or of a critical node used by vehicles, or used for the transmission of electro-magnetic waves. Soft infrastructure includes both physical assets such as highly specialized buildings and equipment, as well as non-physical assets such as the body of rules and regulations governing the various systems, the financing of these systems, as well as the systems and organizations by which professionals are trained (professional training, accreditation and discipline) [Towry-Coker, 2011].

In Soviet economic literature infrastructure is regarded as human services, non-manufacturing business which doesn't generate profit, as a sphere of activity but not sphere of production, where added value is not produced.

Since the late 80's of the XX century western economists have paid considerable attention to the study of the relationship between infrastructure and the productivity, and its impact on economic development. The first generation of studies is based on the production function and cost function; further researches are related to models of economic growth, and the econometric models (vector autoregression). Summarizing the results of many studies, we can say that each of these approaches to the identification of the factors of economic growth justifies the postulate that the infrastructural improvement has a positive effect on the economic growth. At the same time, the most controversial issue is the degree of influence of infrastructural factors, the direction of causality between productivity and infrastructure, as well as the effectiveness of certain types of infrastructure. The researchers also suggest that the effectiveness of public capital investment in infrastructure varies from country to country, regions and sectors [Torrisi, 2009].

Today cities, not states, create of the world's infrastructure of transport, communications, finance, education, and cities are the "engines" of development. It is important to understand that the process of urbanization means not only increase in the number of cities' inhabitants and populated areas, it also means a change in the structure of production, employment, environment and social standards, i.e. require decent infrastructure.

According to the Mc Kinsey Global Institute projections till 2025, cities are expected to need to build commercial and residential buildings equivalent to 85% of today's building

stock or an area the size of Austria. Nearly 80.0 billion cubic meter increase in municipal water demand is expected in the world's cities until the mentioned year [Mc Kinsey Global Institute, 2012].

Regional features of urbanization processes

We must consider some regional peculiarities of urbanization and pursue condition of urban infrastructure as urbanization consequence.

Developed countries have urbanized mostly gradually. The growth of cities in North America and Europe is generally associated with industrialization. It began in the late XIX - early XX centuries, and it's the technical progress that has paced urban upturn. Growth of cities went on gradually, thus urban areas provide inhabitants with decent accommodation and conditions for human development. Cities in developed countries of Western Europe and North America, in general, have well infrastructure and can be considered a sample to follow, although, every city is in some way more or less comfortable for living.

Developing countries today are facing rapid migration that often defines the process of cities growth with only slight influence of authorities.

China economy shows the fastest grows in the world nowadays. Due to the enormous volume of cheap rural work force, massive infrastructure development is the foundation for sustainable economic growth and competitiveness. Functional and fiscal decentralization, that was the result of the tax reform in 1994, significantly increased the financial incentives and the ability of local authorities to develop infrastructure. Despite this, in recent years the Chinese economy demonstrates signs of overheating, because there is still a substantial gap between the infrastructure needed for high growth, and possibilities. The policy of active investment in infrastructure (15% of GDP) keeps being principal in country growth policy [Pravakar Sahoo, Ranjan Kumar Dash, Geethanjali Nataraj, 2010].

According to Chinese statistics, in early 2012, the urban population exceeded 50% [National Bureau of Statistics of China, 2012]. However, many scientists dispute this number. The researchers note that the policy of accelerated development has led to the forced urbanization, which spilled over into violent eviction of farmers from their lands. Many migrant workers, who live in cities, cannot have city residents' rights, and thus far, they cannot be considered as part of the urban population. In many big cities in China, apartments are empty. Housing prices in Beijing and Shanghai are significantly higher than the average income of citizen, 85% of urban population in China is in need of housing improvement, but they cannot afford it. In most Chinese cities, short-term economies of scale are in priority. As a result, many urban localities do not meet the needs of city inhabitants; not take into account environmental aspects, aesthetics [Sahoo , Dash, Nataraj, 2010].

When analysing the current approach of the Chinese authorities to urban growth stimulation, one can predict that insufficient investment in human capital may lead to crisis in urbanization processes, similar to that occurred in the former Soviet republics.

Urbanization in the USSR was, in fact, a by-product of rapid industrialization. Soviet model of urbanization showed significant contradiction between considerable quantitative and inadequate qualitative changes. The rapid growth of the urban population went well ahead of the adaptation of the former rural residents to the urban way of life, urban culture.

The growth of cities has led to a fundamental change in the settlement system and productive forces distribution in the vast territory, but it was not supported by the social priorities of the state.

It should be noted still, that urban development in the USSR was carried out according to certain standards of utilities and social infrastructure provision. These standards reflect the desire to minimize the level of investment in nonmanufacturing sector. However, the state provided all strata of society with free education and health care. This ultimately stimulated cultural, spiritual and physical development of the population, as confirmed by the high level of education and well-being of the Soviet Union in the late 80's of the XX century.

The crisis of the Soviet model of urbanization came together with the crisis of the Soviet model of the state in general, and until today, it has a negative impact on the development of the independent republics of the former USSR. As a result, the significant part of the population does not possess one of factors of production such as entrepreneurial ability. This happened because urban settlements were formed to serve large industrial facilities, which were the base for local economy. Today, these cities are dying, because the former employees of state factories are not ready to work independently. In this case, the solution to the crisis is in creation of a new type of city citizen [Pivovarov, 2001].

Today we can observe significant imbalances in the territorial and economic development of the countries of the former Soviet Union, including urban infrastructure. This resulted in the lack of housing and utilities under the threat of collapse in cities.

In the literature, this phenomenon has got the name of false urbanization or pseudo-urbanization. Pseudo-urbanization is the condition in which a large city has formed in an area without a functional infrastructure to support it. A city in which significant growth in the absence of adequate infrastructure has taken place is deemed as “pseudo-urbanized” [Rengasamy, 2009].

Some researchers argue that urbanity is a typically Western species of the genus economic and civic culture, and a Western phenomenon by its nature [Anton Zijderveld, 1998]. This even resulted in rejection by some Western scholars as true cities many cities developed in post World War II in developing countries, in making distinction of them from the urbanization of the West and in regarding them as “pseudo-urbanization” or “subsistant urbanization” which is something negative and needed to be stopped or avoided through government efforts and policies [Xue, 2010].

Pseudo-urbanization is typical for developing countries. We should consider the example of India, which like China has one of the highest economic growth rates. At the same time, many of the major cities of India have spacious slums – areas with poor housing, which does not meet sanitary requirements, without necessary social and transport infrastructure.

According to the UN forecast, by 2020 the number of people living in slums, will be about 1.4 billion people, 33.1% of the urban population will be living without sanitation and hygiene conditions, mainly in Africa and Asia [The UN, 2011]. This prognosis lets to tell that the urbanization process in the world is uneven and erroneous. It is aimed to provide the productive sector with workforce, but exposes millions of people to a miserable existence.

Infrastructure needs and the sources of their funding

The best way to describe the present situation in the sphere of infrastructural provision of cities is to use notion proposed by D. Worster - infrastructure trap. That is how he named the consequences of construction and development of the irrigation system in the XIX century in California (USA). Water supply infrastructure for agricultural needs in the region was originally created by the owners of the land. Due to the growing production and demand for water, they founded utility company, and it used borrowings to finance the development of the system. Because of the lack of private funding, construction projects were held up several times; after that the ecosystem of the local rivers became impossible to restore. Hard ecological situation has led to the centralization of infrastructure management in the state bodies. Nevertheless, today one can establish the fact of failure of public financing for maintenance and development of infrastructure, and the question of search of new investment resources is on the agenda [Worster, 1994].

Thus, the economic growth achieved due to infrastructure investment reaches "environmental dead-end", because natural resources of regions are limited, and the intensification of production cannot be infinite. At the same time, world urbanization and increase of infrastructural needs seem objective.

The OECD projects that infrastructural needs in the next decade will increase significantly under the influence of global economic growth, technological progress, climate change, urbanization. Besides the existing infrastructure is aging rapidly, and permanent budget deficits in many countries makes its renovation difficult. This results in a shortage of traditional sources for investment, that's why alternative ways of funds attraction are to be found, as well as optimization of the use of the existing infrastructure is to be implemented.

Rough estimates of OECD show that by 2030 the total investment needs of the member countries for telecommunications, roads, railways, electricity and water supply will amount up to 2.5% of world GDP. If one adds the facilities for electricity, oil, gas and coal production, investment needs of OECD countries will reach the level of 3.5% of world GDP. These numbers don't include the cost of development of airports, ports and warehouses infrastructure. Mostly funds are required to create new infrastructure [The OECD, 2007]. These estimates relate to 34 OECD member countries, which are developed countries and already have sufficient infrastructure for normal human existence. Assessment of needs for infrastructure investment to the developing and poor countries may considerably exceed mentioned OECD forecasts.

For many countries, crisis is time and incentive to reconsider the policy and change priorities of state regulation, to define new models of economic growth. At the same time, the post-crisis economic policy of the United States, China, and India shows that infrastructure investments are still government priority.

Given estimations prove that infrastructural needs cannot be satisfied with traditional sources of financing. OECD strongly recommends that member countries use the possibilities to attract business to the implementation of infrastructure projects (public-private partnerships, resources of pension funds and other large institutional investors), as well as an opportunity to diversify and expand the traditional sources of revenue, which, in essence, means an increase in the tax burden [The OECD, 2007].

The last trend in Western Europe and the U.S. is an entrepreneurial city. Many municipalities have entered into a struggle for limited resources. This resulted in business-led urban development, technological innovation, striving for social and environmental sustainability. This is often coupled with aggressive marketing: to become an EU 'capital of culture' or to host the Olympic Games or some international trade fairs etc. One of the determinative factors of this tendency is infrastructure. Private sector domination of the city can result in a decline of public services and infrastructure; the marketization of educational institutions; assistance for business as the first priority of local government [Vakoulenko, 2004].

An investment activity in certain region depends on the condition of the object for investment, and on territorial factors of the region for investment. It is important to note that infrastructural factors can be identified in both mentioned groups of factors. Thereby, urban infrastructure is an important factor in investment decision making. Increased competition between cities make leaders at the local and state level to create strategies that would enable them to effectively compete on the investment resources market and to finance infrastructure projects.

If taking into account the OECD forecasts, it is clear that own resources of municipalities and raised funds cannot cover enormous need for infrastructure investments.

In this case, the issue of infrastructure traps demand the alternative approaches to its solution. We suggest considering the original (and the simplest) way to finance infrastructure projects – collective funding by stakeholders, i.e. users of the infrastructure, city residents. Because of current size of infrastructural needs, estimated projects cost this idea seems to be impossible to implement, but this source of funding worth to be evaluated.

Nowadays infrastructural fundraising is widely spread for social, scientific and cultural projects. In USA volunteering and philanthropy is especially widespread. According to the Annual Report on Philanthropy for the Year 2011, charity contributions for the mentioned period for the spheres of education, human services, health, public society benefit, arts, culture and environment are equal to USD 141.31 billion (47.4% of total raised amount) [The Giving USA Foundation, 2012]. These funds are not regulated by government and local authorities, but still are invested into projects which gain profit for the whole society.

There is evidence of collective financing of infrastructure needs from Ukraine. The project of construction of the "Children's Hospital of the Future" in capital city Kiev is procured solely by private contributions. It is important to note that the Ukrainians, as well as other citizens of the former Soviet Union, after the collapse of the financial system in the early 90's of the XX century are not likely to invest their savings. At the same time, due to the mass media advertising the charity fund, which organized the hospital construction, managed to raise UAH 154.5 million of donations (about 19 million US dollars) during 2006 – 1st half of 2012. This fundraising involved 633 businesses and 10,280 individuals [The official internet page of Charity Fund "Children's Hospital of the Future", 2013]. It should be noted that the hospital was not built (as of February 2013), but the raised amount confirms the readiness of citizens to invest in the urban infrastructure development. If this project had been implemented successfully by local authorities under the proper control, it would have had a significant positive effect for the citizens who invested their money, and for the politicians who would have realized the wishes of voters.

Legislation of Russian Federation provides for the possibility of self-taxation of citizens – to impose onetime payments to address specific local issues. The decision to enforce self-taxation procedure must be made by local referendum. In Russia self-taxation is the most spread in Kirovskaya region. During the years 2006-2009, 99 local referendums were conducted and RUR 5.2 million was raised for municipal needs in this region [Nikita Belyh, 2009]. Unfortunately whole country statistics is absent.

Financing of election campaign in the United States can be a good example of funding for political initiatives. The main source to provide campaign activities is donations from citizens. Surely elections are not financed only by private contributions of citizens, but the overall collected amounts impress on. For instance, according to the U.S. Federal Election Commission data, during the presidential campaign of 2012 all candidates raised 584.2 million USD of individual contributions less than 200 dollars [The Federal Election Commission, 2013]. These facts prove that political ideas can give the ground to attract funding, because citizens expect to receive indirect benefits of these donations. Right coverage and the use of PR-technologies can make municipal infrastructure projects to be successful crowdfunding projects, because of high gain for the donators, even though it cannot be expressed in monetary terms (because as a result social objects of common use are created).

Thus, we can talk about the prospects of elaboration of infrastructure fundraising. By this notion we mean the process of raising funds and other resources on non-reimbursable basis for the municipal infrastructure projects implementation. We believe that such initiatives should come from the local governments, because the creation and renovation of infrastructure include construction projects, which are better to control centrally.

Conclusion

On the one hand, acceleration of urbanization processes has a positive effect on economic development, because it helps to concentrate material, financial, and human resources in one place and to use them more effectively. On the other hand, in many cities, increasing in the number of inhabitants goes much faster than the development of infrastructure. Inability to meet the investment needs for infrastructure development requires a search for new sources of funding. In this paper, we propose the way to attract household savings to finance infrastructure projects.

In our opinion, the implementation of infrastructure fundraising is possible only at the municipal level. This idea is consistent with current trends of entrepreneurial cities appearance, when strategic planning functions are passed to the local level. Self-taxation implementation requires additional study of the social and economic conditions and public opinion in certain city in order to identify the prior needs of citizens and their willingness to finance infrastructure projects.

Further theoretical studies on this question should be carried out using a multi-disciplinary approach, namely to study the behavioral characteristics of individuals in a certain economic conditions, individual disposition to charity donations, the effect of the collective and society influence in this regard. It is useful to develop practical tools of financial PR to raise private funds to finance infrastructure projects.

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Svetske urbanizacijske perspektive i problem infrastrukturnih mera

***REZIME** – Ovaj članak opisuje svetske urbanizacijske prospekte, otkriva neke od osobenosti razvijanja grada u različitim regionima, i pravi analize zavisnosti ekonomskog rasta i ulaganja u infrastrukturu. Kao rezultat, uočene su značajne razlike u urbanizacijskim procesima i u infrastrukturnom snabdevanju, novi izvori finansiranja, nude se za rešavanje ovog problema.*

***KLJUČNE REČI**: infrastruktura, urbanizacija, kapitalne investicije, infrastrukturni fandrajzing*

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