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EVOLUTIONARY DEVELOPMENT OF MAJOR CITIES OF THE RUSSIAN FEDERATION: NEW TOOLS FOR TERRITORIAL MANAGEMENT

Ph. D. I. S. Glebova
Kazan Federal University, Kazan, Russia
gle-irina@yandex.ru
Ph. D. S. S. Berman
Kazan Federal University, Kazan, Russia
sv180@mail.ru
Ph. D. R. A. Abramov
Plekhanov Russian University of Economics, Moscow, Russia
oef08@mail.ru

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Abstract

A modern city is a complex multifunctional system concentrating considerable material, financial and labour resources. Cities are the most active adopters and sources of innovation, being the spatial centres of progressive change in all spheres of social life. However, an inseparable part of the history of urbanisation is also the history of cities losing their power and eventually leading a quiet life of local centres of small territories or completely dying out. This is an attribute of the urban cycle pattern. Most of the times, a decline in a city's development rates is incomprehensible for several years and failure to timely address it prevents the city from restoring its previous levels of development. That accounts for the need to analyse the evolutionary development of territories. Importantly, the indicators included in such analysis are primary indicators of urban socioeconomic development and their dynamics are closely linked with the city's image and stability of management.

Keywords

Evolutionary development – Development phases – Managing major cities

Para Citar este Artículo:

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Introduction

Managing a city's socioeconomic development is a focused process of enhancing living standards and popular wellbeing, the level of development and competitiveness of the production and service sectors, as well as territorial management performance. Analyses of a city's evolution and management decisions allow forecasting urban development taking into account the cyclical patterns and avoiding past mistakes in city management.

The purpose of this study is the assessment of the phases of the evolutionary development of Russia's major cities in 2008-2016 with a view to developing new approaches to managing territories. The conclusions are based on the conducted analysis of statistics for 13 cities, as well as expert assessments. The following cities were studied: Volgograd, Voronezh, Ekaterinburg, Kazan, Krasnoyarsk, Nizhny Novgorod, Novosibirsk, Omsk, Perm, Rostov-on-Don, Samara, Ufa and Chelyabinsk. The subject is evolutionary development management of major cities in Russia.

Historical evidence clearly shows that territorial development cannot be represented as a monotonically increasing function. Since the 1970s, cyclical processes have been studied at various levels of spatial socioeconomic systems operating within a country, namely, regions, cities and agglomerations[1]. The cyclical regional pattern is also reflected in the theory of growth poles[2] stating that spatial economic centres, which accommodate production of leading industries, become the poles of inputs as they ensure their most efficient operation. A regional growth pole aggregates growing and expanding industries within an urban area with a potential of further development of economic activity within their influence regions. Therefore, a growth pole may be approached as a geographic agglomeration of economic activity or as a network of cities accommodating a complex of rapidly developing production facilities with export orientation. The pole growth is sustained by impulses of national demand and feeds through to secondary industries. The first study of the urban evolutionary phase was conducted by Jay Forrester, the outstanding American researcher, professor, leading expert in major systems and computer management theory. He established that urban infrastructure pays off more than city-forming main employers. Therefore, a decline in income at enterprises leads to lower personal income for the whole population; the demand for city infrastructure thus decreases and further causes city stagnation. The major limiting factor is the territory, i.e. the lack of development space may cause stagnation. J. Forrester also believed that urban systems could not develop stably at a uniform pace, the slacking areas needed support, growth in one indicator did not necessarily cause growth in another indicator, even if the indicators are closely linked together[3].

[1] A. Croitori, “Schumpeter, J. Business cycles: a theoretical, historical and statistical analysis of the capital process”, Journal of comparative research in anthropology and sociology, Vol: 8 num 1 (2017): 67-80; F. Braudel, Civilization materielle, economies, et capitalism: XV–XVIII siecle, vol. 3 (Paris: Armand Colin, 1979); I. Wallerstein, “The Invention of Time Space Realities: Towards an Understanding of our Historical Systems”, Geography, Vol: 73 num 4 (1988): 289-297 y F. Perry, F. Diffusion of innovation and regional economic growth. The Annals-Region Science, num 5 (1998).

[2] J. Boudeville, Les espaces economiques (Paris: Puf, 1970) y P. Martin y G. I. P. Ottaviano, “Growth and agglomeration”, International economic review, Vol: 42 num 4 (2001): 947-968.

[3] J. W. Forrester, Urban dynamics (Waltham: Pegasus communications, 1969) y J. W. Forrester, “Policies, decisions and information sources for modeling”, European J. Operational Res, Vol: 59 num 1 (1992): 42-63.

The papers by modern researchers[4] represent the cyclical development process as a result of interaction between the external environment and basic urban life processes linked together by positive and negative feedback contours. Other authors cite urban economic cycles as a primary cause inciting the urban development cycles. For monotowns, their life-cycle dynamics will be determined by the dynamic of the sole city-forming employer[5]. One of the latest theories relates to the idea of people's needs and interests as a driving force in urban development: “while the new economy is the economy of human value added, its main basis being not resources but humans, human labour and creativity, thus, such new citizen is the major taxpayer and major source of all goods. And a stakeholder in all respects”[6].

Methods

In this paper, the phases of urban evolutionary development were assessed based on Jay Forrester's methods. The analysis included the calculation of four indicators:

1) population (thousand people);
2) job vacancies;
3) new housing supply (sq. m.);
4) per capita public goods (thousand roubles).

Firstly, the average growth rate was calculated for each of the selected indicators as a relation of the current level vs the previous period; the average was further calculated for the obtained results. The following conventional references were used for easier calculations:

∆ H for the average growth rate of new housing supply;
∆ PG for the average growth rate of per capita public goods;
∆ P for the average population growth rate;
∆ J for the average growth rate of job vacancies in the city.

To determine the urban development phase, we compared the average growth rates for the above indicators. The "development" phase is characterised by outpacing growth in the indicators of new housing supply and per capita public goods compared to the aggregate of the population and job vacancy growth rate:

∆ (H and PG.)> ∆ (P and J) or (∆ H> ∆ P and ∆ H> ∆ J) and (∆PG> ∆ P and ∆ PG> J∆).

[4] R. H. Samet, “omplexity, the science of cities and long-range futures”, Future, num 47 (2013): 49-58; S. V. Ward, “Cities as planning models”, Planning perspective, Vol: 28 num 2 (2013): 295-313 y A. Potter y H. D. Wattsy, “Evolutionary agglomeration theory: Increasing returns, diminishing returns, and the industry life cycle”, Journal of Economic Geography, Vol: 11 num 3 (2011): 417-455.

[5] G. Halseth, Transformation of Resource Towns and Peripheries: Political economy perspectives. University of Northern British Columbia. Canada. 2016 y V. Kandpal, “Shaping India’s future by building smart future sustainable cities”, International journal of Electronic government research, Vol: 14 num 4 (2018): 27-38.

[6] S. Joss, “Future cities: asserting public governance”, Palgrave Communications, Vol: 4 num 1 2018).

The "growth" phase indicates a reverse situation compared to the "development" phase, with population and job vacancy growth rates running ahead of new housing supply and per capita public goods:

Δ (P and J)> Δ (H and PG) or (Δ P> Δ H and Δ P> Δ PG) and (Δ J> Δ H and Δ J> Δ PG).

In the "stagnation" phase, population growth exceeds the growth of labour demand and per capita public goods and the population is balanced with new housing supply:

P>J and Δ P> Δ PG and P = H.

The "decline" phase is characterised with a decline in all base indicators:

Δ H↓ Δ P↓ Δ J↓ Δ PG↓, with the deteriorating quality of services, residential housing and public goods.

Results

Our method included the calculation of growth rates for population, job vacancies, new housing supply and aggregate spending on healthcare, education, sports, culture and utilities as a proxy for public goods availability for all major cities of the Russian Federation for the period from 2008 till 2016. Based on the calculations, indicators were derived to identify the phase of urban development for each analysed time interval. For instance, Kazan is in the growth phase, as the average population and labour demand growth rates are above the rates of new housing supply and per capita public goods (Figure 1).

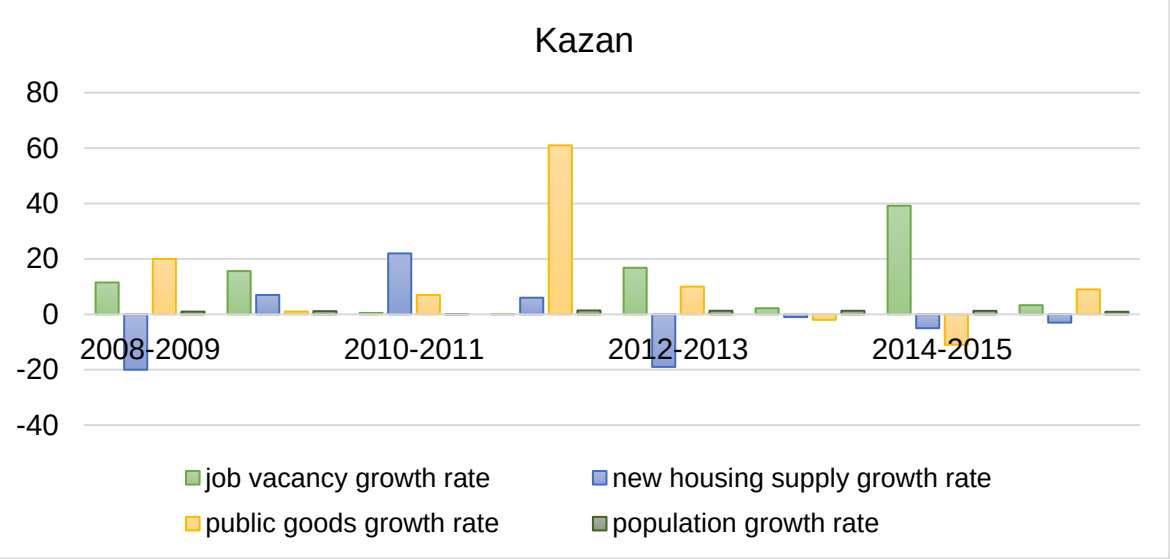

Figure 1
Growth rates of indicators in Kazan for 2008-2016
Source: developed by the authors

Over the analysed period, Kazan's transition from one phase to the other phase depended on several factors: the overall national economic situation; hosting the 2013 Universiade; preparation for sports megaprojects (2015 World Aquatics Championship,

FIFA 2018). Thus, during the global financial crisis in 2008-2009, even as it enjoyed the "growth" phase, the new housing supply rate showed a considerable decline, though not as sharp as in Samara, Ufa and Chelyabinsk. The following years marked by the "development" phase, and all indicators showed positive dynamics until 2013. A considerable slowdown in construction in 2013 was due to the lack of development space. Besides, the residential housing market over the discussed period was influenced by declining purchasing power and high mortgage interest rates. The slowdown in funding reflected high inflation and aspirations for economic stabilisation after the crisis. The period of 2015-2016 in Kazan came as a period of transition between the development and growth phases, reflecting a decline of new housing supply.

Despite its "development-phase" averages, Ufa has registered a slowed development profile in recent years (Figure 2).

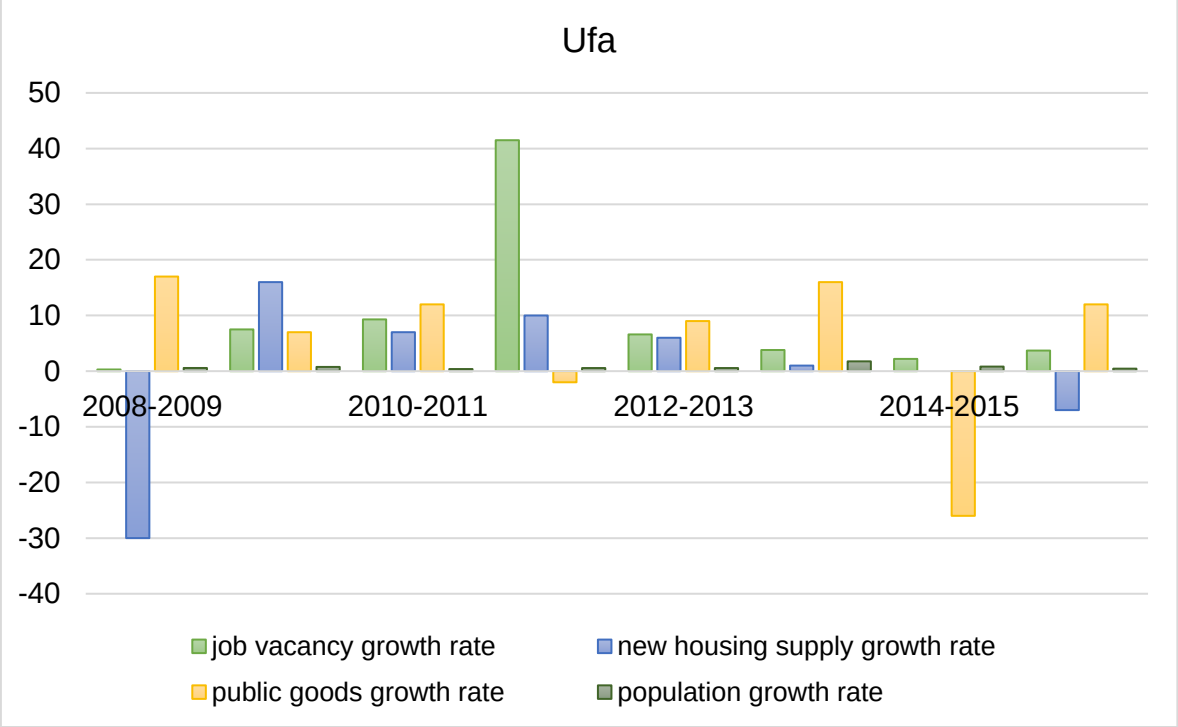

Figure 2
Growth rates of indicators in Ufa for 2008-2016
Source: developed by the authors

The calculations show that population growth figures are low and do not exceed 1%, while the job vacancy rates have been negative since 2013. The decline in vacancies has adversely affected population trends, as it deteriorated the city's migration profile. Near-zero rates of new housing supply are linked to higher prices and simultaneous declines in the purchasing power. City development is coming to a halt and may reach the "stagnation" phase in the near future.

Samara is in the "growth" phase, however, the problem is zero growth in population (Figure 3). No growth has been observed in the new housing supply over the recent years; a visible decline has started in 2013. The public goods' rates have also been negative. Despite the positive trend in job vacancies in the city, their overall numbers have declined.

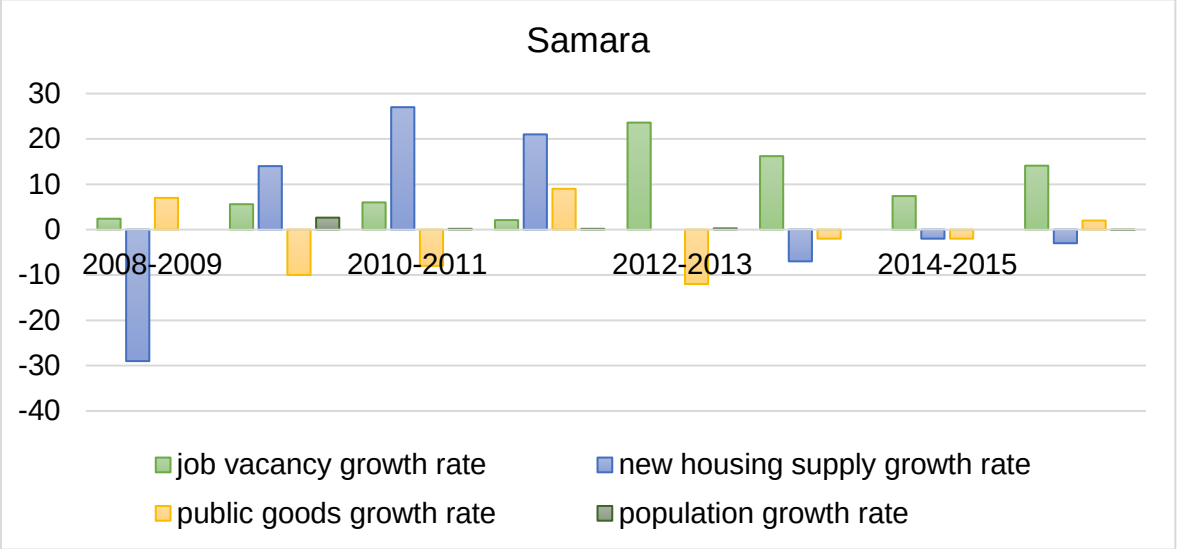

Figure 3
Growth rates of indicators in Samara for 2008-2016
Source: developed by the authors

Ekaterinburg is in the "growth" phase (Figure 4). The city's active development is supported by the constantly growing population. After a decline in 2013-2014, labour demand comes at 7.8% by 2015. The new housing supply has been mixed, with a negative rate registered in 2012-2013, which might be linked to the economic crisis and high inflation. The growth rates of per capita public goods have shown a negative average, however, a nascent positive trend was observed in 2015.

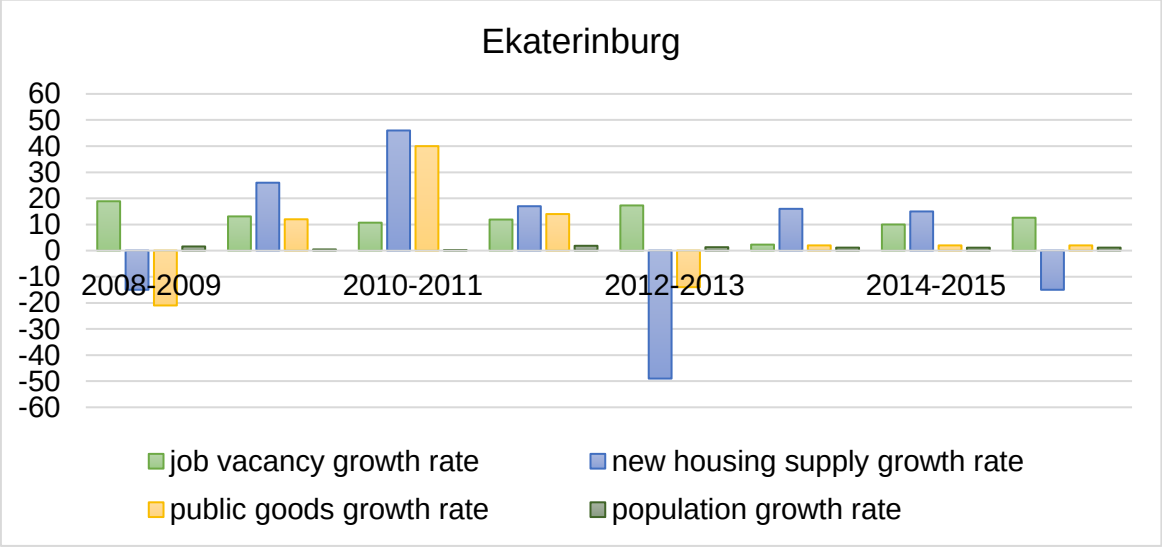

Figure 4
Growth rates of indicators in Ekaterinburg for 2008-2016
Source: developed by the authors

Nizhny Novgorod is in the "development" phase, despite the negative population growth figure on average for the period from 2008 to 2015 (Figure 5).

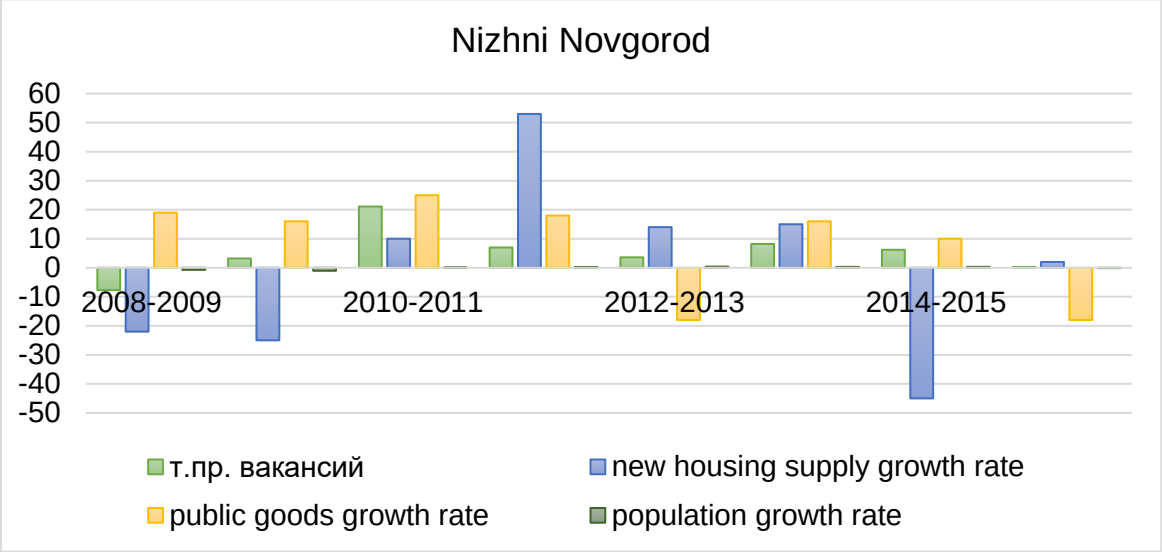

Figure 5
Growth rates of indicators in Nizhni Novgorod for 2008-2016
Source: developed by the authors

New housing supply averages follow a positive trend in general, however, the indicator declined considerably in 2014-2013, which impaired buying potential. Generally, Nizhny Novgorod is in the "development" phase, however, if the issues of declining population, new housing supply and public goods availability are not addressed, the city may emerge in the "growth" phase and move further to "stagnation" in the near term.

Novosibirsk is in the "development" phase: the rates of new housing supply and per capita public goods funding are above population growth and job vacancy growth rates (Figure 6).

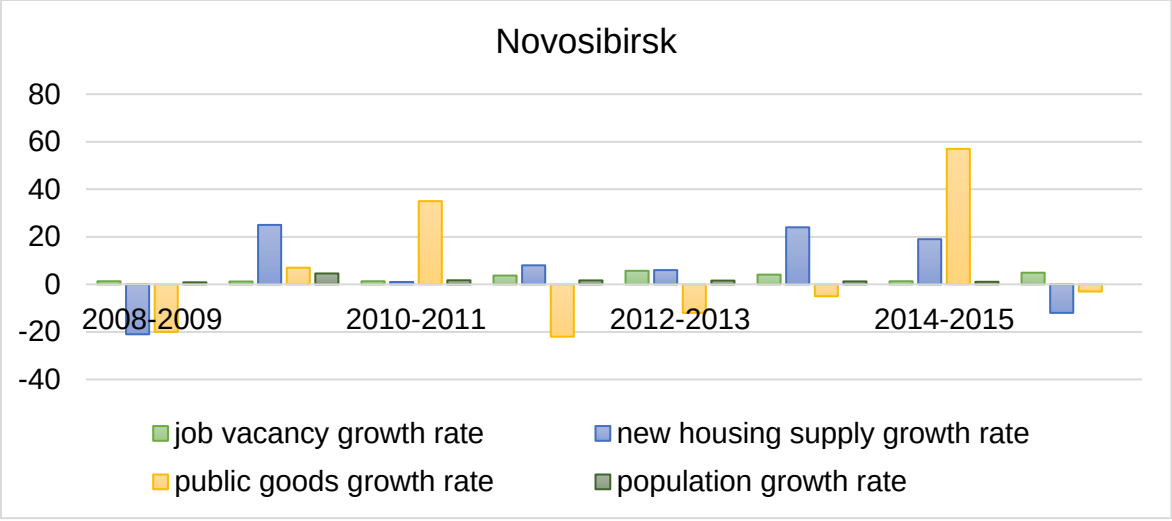

Figure 6
Growth rates of indicators in Novosibirsk for 2008-2016
Source: developed by the authors

In 2008-2009, the city's profile appeared as a "growth" phase nearing the stage of "stagnation" due to economic instability. The period of 2009-2011 marked the "development" phase followed by "growth" later on. However, in 2015-2016, negative growth rates in new housing supply and public goods funding brought Novosibirsk back to the "development" phase.

The years 2010-2013 in Chelyabinsk constituted the "growth" phase; negative growth rates were observed in the number of job vacancies and new housing supply; the growth of population and per capita public goods funding slowed down. Such trend was due to the overall instability of the economic situation. The two subsequent periods were marked by changing dynamics, as the city stepped into the "stagnation" phase.

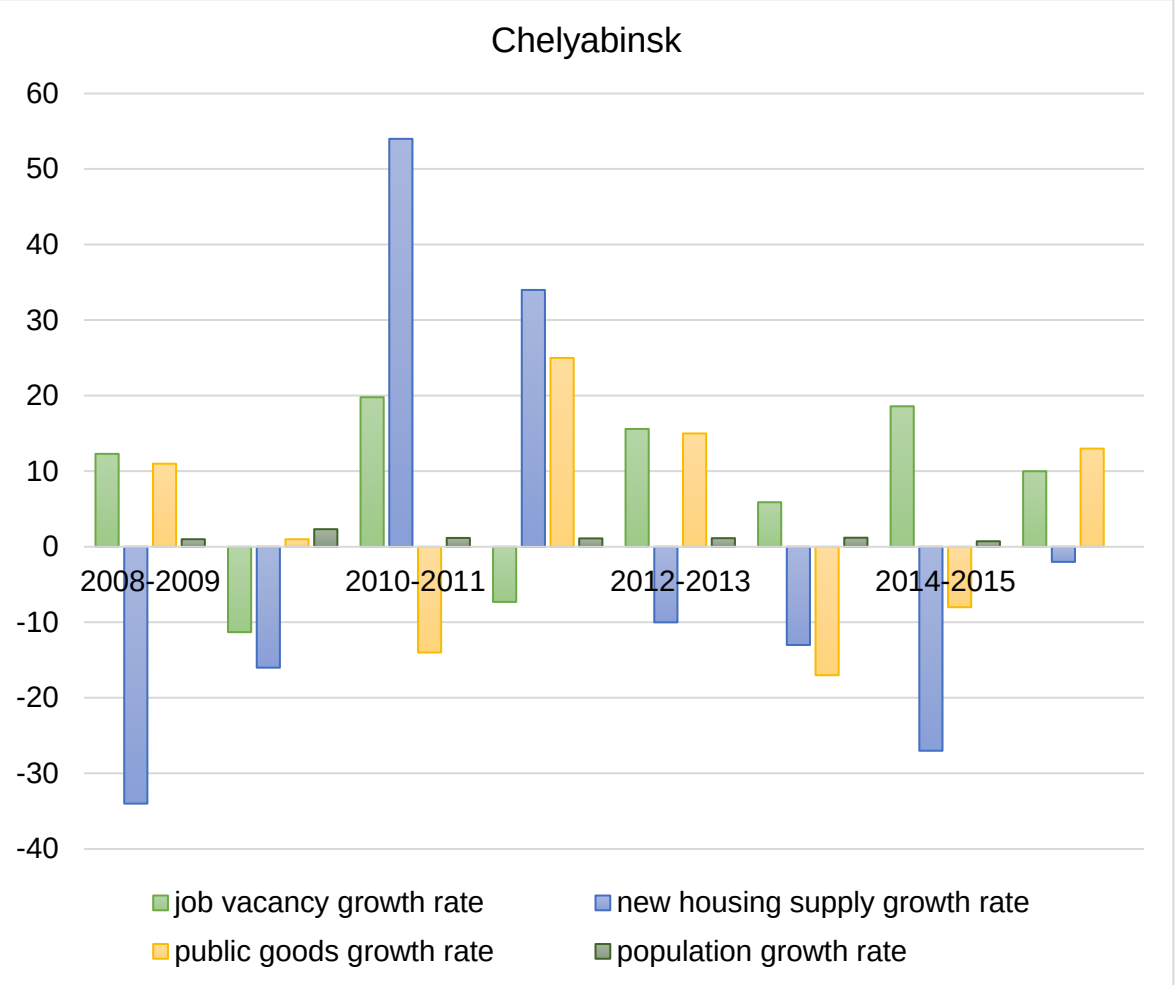

Figure 7
Growth rates of indicators in Chelyabinsk for 2008-2016
Source: developed by the authors

Based on the findings for Omsk, the whole analysed period predominantly indicated "stagnation", as the attempts of the municipal government to improve the situation in the housing market failed to produce a standing positive effect in the area (Figure 8). The slowdown of population and business activity growth in Omsk (negative job vacancy trends between 2010 and 2015) led to a deterioration of all socioeconomic indicators in 2014.

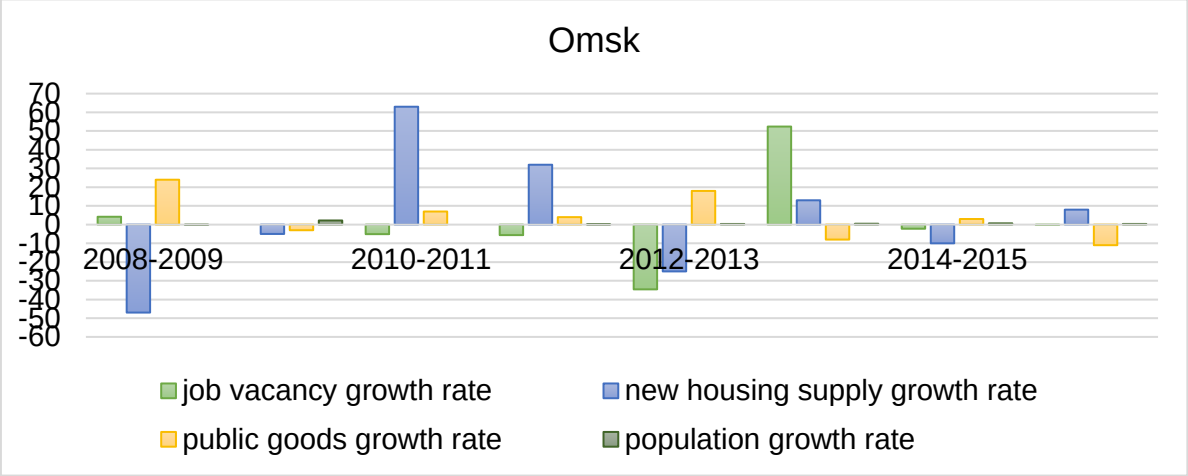

Figure 8
Growth rates of indicators in Omsk for 2008-2016
Source: developed by the authors

During the economic crisis, Rostov-on-Don showed a "growth" phase, the new housing supply rates were relatively low (Figure 9). In subsequent years, the dynamics were positive and the city progressed to the "development" phase. In 2013-2014, the dynamics of public goods declined, which transferred Rostov-on-Don to the "growth" phase and the subsequent period was marked by lower levels of all indicators, as the city stepped into the "stagnation" phase (2014-2015). By 2015-2016, the "development" phase had been restored.

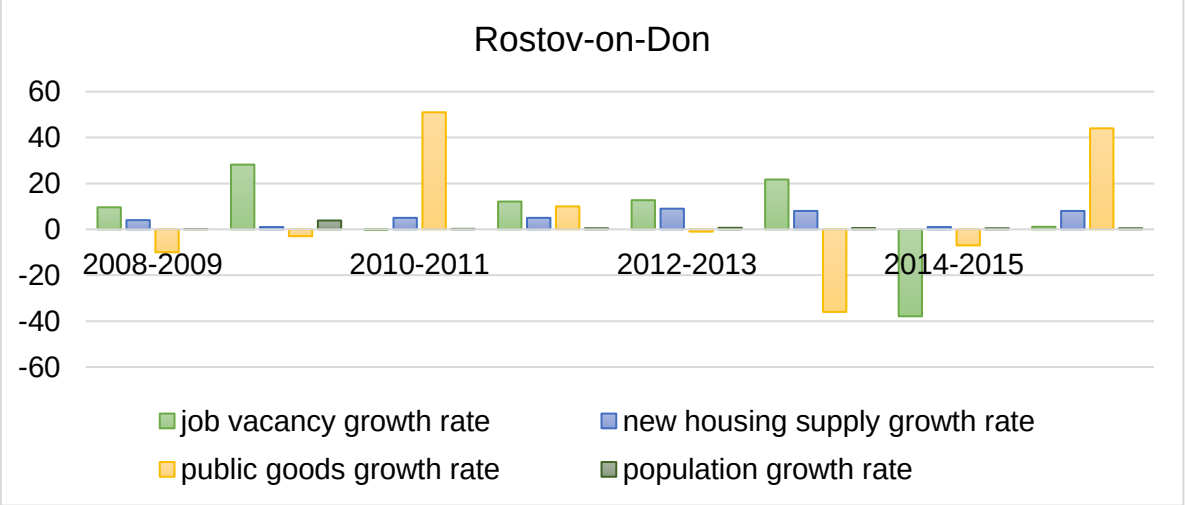

Figure 9
Growth rates of indicators in Rostov-on-Don for 2008-2016
Source: developed by the authors

The progression of Krasnoyarsk between phases over the analysed period shows a mixed pattern. Despite the "development" phase identified in the period from 2008 to 2010, all indicators were near zero (Figure 10). In 2012-2013, the city stepped into the "stagnation" phase and, by the last studied period, had limited the negative trend in all indicators.

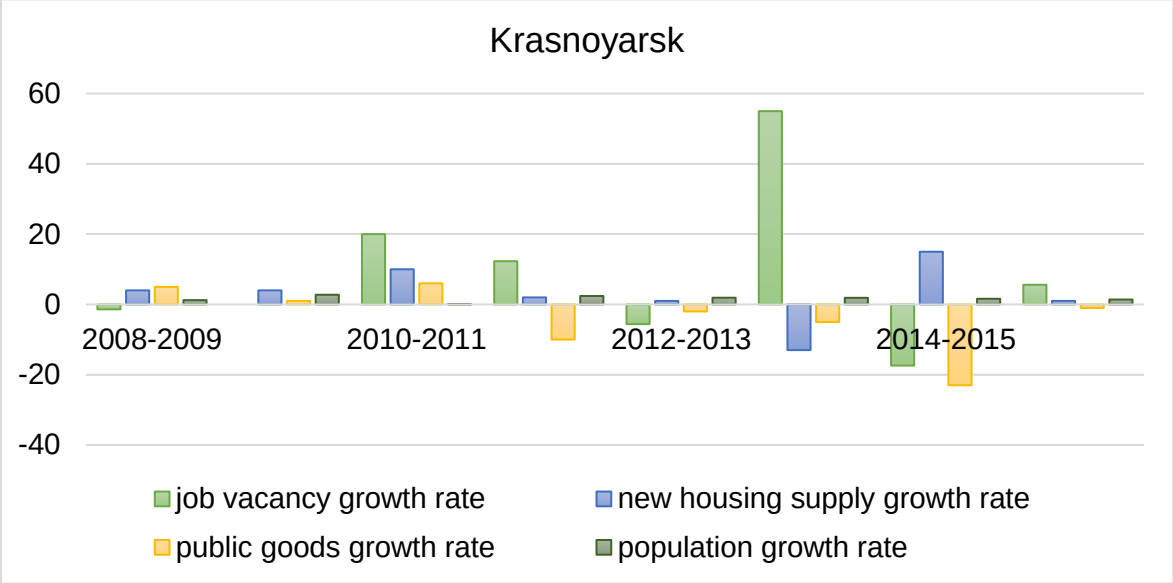

Figure 10
Growth rates of indicators in Krasnoyarsk for 2008-2016
Source: developed by the authors

Perm's profile over the whole analysed period showed wave-shaped dynamics, the only stable chapter being the new housing supply growth until 2014 (Figure 11). Population growth rates showed limited positive dynamics. Due to these indicators, the city ran the "growth" phase until 2013. In 2014-2015, the "stagnation" phase approaching the "decline" phase was observed due to the complicated conditions in the labour supply market and declining average salaries in the region.

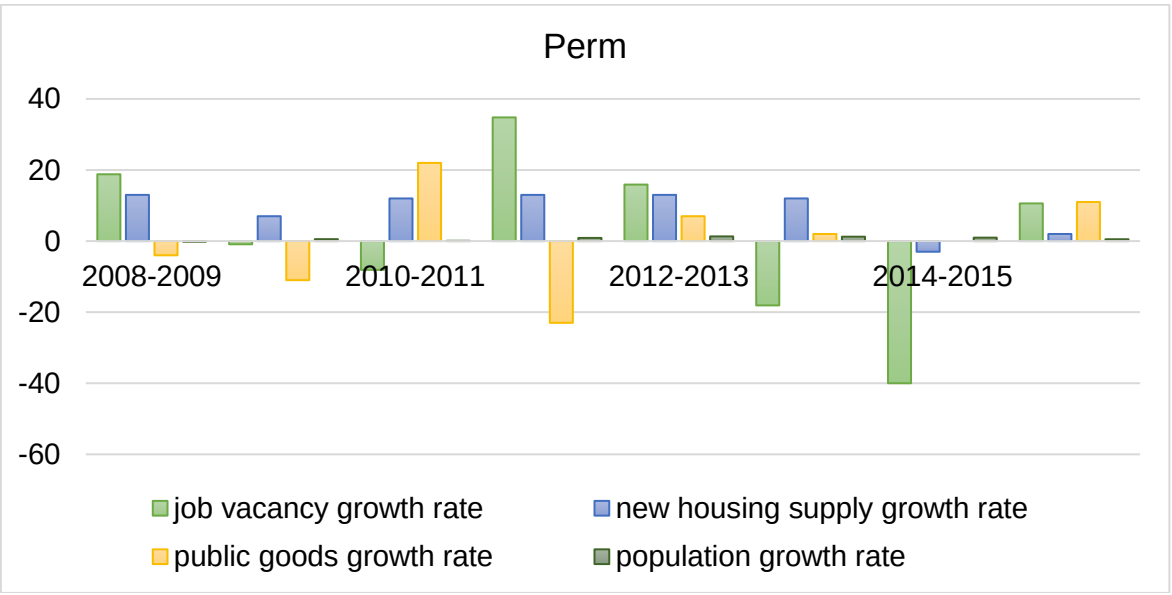

Figure 11
Growth rates of indicators in Perm for 2008-2016
Source: developed by the authors

At the beginning of the analysed period, Voronezh's phase was that of "development" and then, in 2010-2013, the dynamics changed, the city stepped into the "growth" phase (Figure 12). The city's socioeconomic trends were positive in the subsequent years, which kept it stably in the "development" phase.

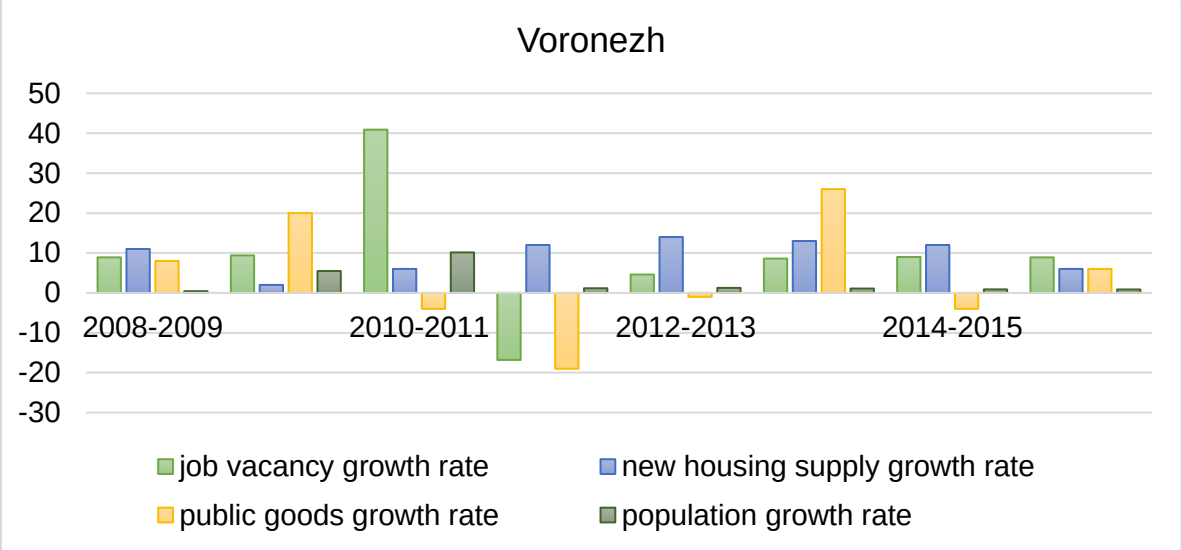

Figure 12
Growth rates of indicators in Voronezh for 2008-2016
Source: developed by the authors

The growth rate trends in Volgograd were unstable in all periods. In 2008-2009, the city was in the "development" phase, the situation changed in the subsequent years, as Volgograd proceeded to the "growth" phase. The period of 2014-2015 was that of "stagnation", in 2015-2016, the situation improved and the city entered the "growth" phase.

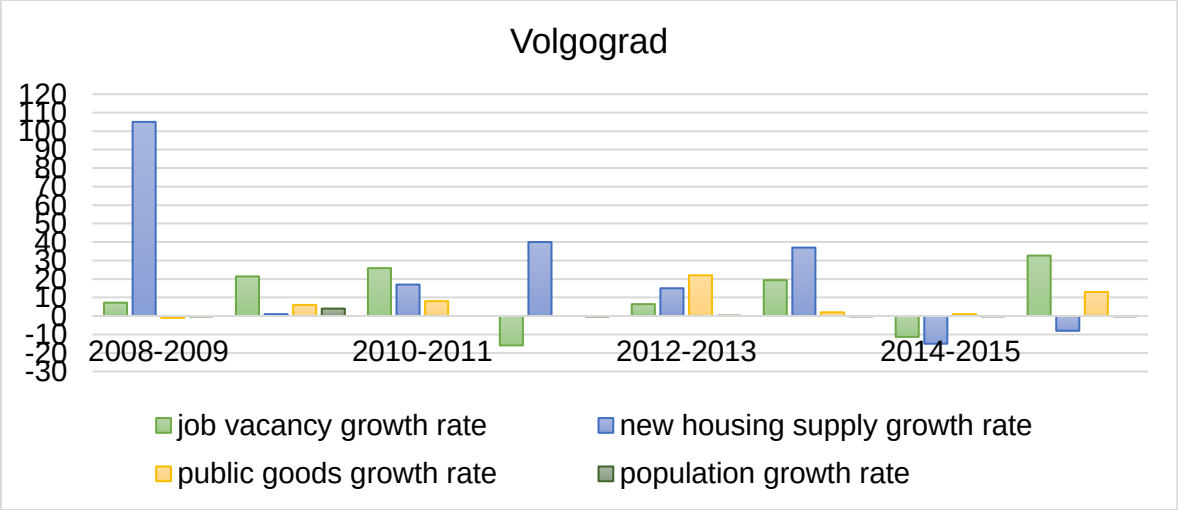

Figure 13
Growth rates of indicators in Volgograd for 2008-2016
Source: developed by the authors

Thus, the situation of "stagnation" is observed in Nizhny Novgorod, Novosibirsk, Chelyabinsk and Omsk, because the trends in the studied indicators are negative for the past two analysed periods. Kazan, Ufa, Samara, Ekaterinburg, Krasnoyarsk, Perm and Volgograd are in the "growth" phase at the end of the analysed period, but may further enter a slowdown phase. The "development" phase is observed in Rostov-on-Don and Voronezh.

Discussion

Determining the urban development phase helps to assess the current standing of the territory based on statistical data, however, the dynamics of indicators often depends on the performance of local authorities. We suggest there may be three major management instruments influencing the position of Russia's major cities in a particular evolutionary phase:

1) the dynamics of funding and performance in implementation of federal and municipal programs (shows the opportunity for lobbying city interests by municipal authorities at the federal level; the regional capital status nationally);
2) the brand of major Russian cities projected in the media and the implementation of "special" events, the mayor's image ("special" events or megaprojects operate as a technology and resource for successful implementation of commercial and non-profit ideas; these can be instrumental in shaping the reputation and image of hosts and may become the city's signature and symbol of its unique cultural, natural and historical heritage;
3) the public transition of power via the mechanism of democratic election (a stable and legitimate power structure creates the potential for local governments to implement long-term city development strategies supported by primary stakeholders in the area).

The analysis of 13 Russian major cities suggested the following considerations concerning the influence of management instruments over the city's evolutionary development phase:

- the dynamics of funding of federal and municipal programs do not generally affect the territorial evolutionary development. The cities with low profiles of evolutionary development had more funding in 2008-2016, meanwhile, it was lower in the cities with high development levels. The programs funded from the federal and municipal budgets are considerably similar in terms of their goals, tasks, intended outcomes and implementation mechanisms in the discussed cities but the cities' evolutionary phases are different;
- by providing information coverage of a city, the media project certain perceptions of the territory. We conducted content analysis for major cities of the Russian Federation to identify the overall number of positive and negative references in three print titles for 2016 (Rossiyskaya Gazeta, Nezavisimaya Gazeta and Izvestiya). The findings indicate that the top three cities by the number of positive references in the three newspapers are Volgograd, Perm and Rostov-on-Don and the top three for negative references comprise Chelyabinsk, Omsk and Samara. That said, Volgograd receives the least coverage both in the positive and negative terms;
- the cities in the "growth" phase (Kazan, Ufa, Ekaterinburg and Volgograd) are frequently cited in the media and have a track record of megaproject

implementation. In Ufa, Novosibirsk, Ekaterinburg and Volgograd, city leaders have poor ratings and change of power occurs frequently;

- the cities in the "stagnation" phase according to the findings, i.e. Nizhny Novgorod, Chelyabinsk and Omsk, fail to engage in building and promoting the city image and are characterised by frequent change of government authorities.

Conclusions

The analysis of urban evolutionary development allows a complex assessment of the socioeconomic development of a territory taking into account the dynamics of population, job vacancies, new housing supply and per capita public goods availability. However, these indicators, as well as city development overall, are influenced by a number of factors, such as the quality of performance of socioeconomic programs and megaprojects, the perceptions of the city brand, the image of the territorial leader and the stability of management. The performance of local authorities is, beyond doubt, a major factor of evolutionary urban development. This means that a key task for municipal governments is fostering leadership and organisational measures to develop a favourable investment climate, improve investment return potential, minimise risks for stable socioeconomic development and enhance living standards.

Major Russian cities are quite diverse by many indicators, such as geography, socioeconomic profile, population, etc. However, the development in each case is considerably dependent on the government system and authorities' abilities to find common ground with all stakeholders in the territory. Cooperating in the development of a vision for the future and in setting goals consistent with the city's actual needs would foster stakeholder engagement, as the respective strategy would be thus perceived as owned by the parties, not just imposed on them. Besides, an agreed urban development plan helps to bring down risks related to change of power and thus maintain the territory on the path of evolutionary development.

Acknowledgment

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