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Developing a concept for the economic and social management of a city with due account for the predicted industrial development

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Subject. Theoretical, methodological, and practical issues related to the economic and social management of the city with due account of the predicted values of the industrial development.

Objectives. Justification of scientific and methodological provisions of a conceptual nature related to urban management and solving local social problems by forecasting the level of industrial development.

Methodology. The authors put forward a hypothesis: if the level of industrial development is forecasted accurately, it is possible to plan upcoming changes in the main economic and social indicators of the municipal economy. Theoretically, the hypothesis is based on the method of logical scaling and synthesis of scientific and practical knowledge. Statistical studies were conducted using the method of econometric and financial analysis based on socio-economic indicators of industrial cities in the Southern Federal District of Russia for the period from 2013 to 2022. Forecasting for the subsequent periods is based on an applied approach to constructing estimates of the quasi-maximal likelihood of the level of industrial development, which was carried out using the theory of stochastic differential equations based on methods of probabilistic forecasting.

Results and discussion. As a result of the study, it was substantiated that municipal management contributes to the production of material goods and to harmonisation of socio-economic relations between local authorities, businesses, public organisations, and individuals, which are interrelated with the level of industrial development of a city. The developed applied approach to constructing estimates of the quasi-maximal likelihood of values of socio-economic parameters makes it possible to forecast the level of industrial development of cities in the Russian Federation. Point and interval forecasts lay the foundation for planning economic and other indicators. The concept of economic and social management of administrative-territorial units was proposed. The mandatory socio-economic blocks of the concept were supplemented with the functionality of prediction modelling, which requires further discussion, critical understanding, and subsequent improvement. Future changes in local industrial policy need to be analysed and evaluated in terms of their effectiveness in the context of structural modernisation of the economic and organisational mechanism for urban and social management of the city.

Key words: urban economy, management, social sphere, industrial development, prediction modelling.

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Introduction

The social and economic relations on the municipal level are of a dual nature. On the one hand, it is impossible to achieve order and to build a civil society without a strong hand from the state. However, the democratisation of public administration is impossible without the decentralisation of intergovernmental relations. In addition, without the democratisation of public administration, it is impossible to create capable institutions of local government.

When creating units of the urban economy, the administration has the right to reorganise or liquidate them with the agreement of the established authorities. The economic entities of the city receive the so-called municipal assignment. These can be autonomous or statefunded organisations that receive financial support from the local administration. A specified percentage of the profit from the municipal property used by the municipal enterprise (institution, business company) is spent on the needs of the city. In addition, after taxes and other deductions are paid, a certain share of the profits of these organisations goes into the city budget in a timely manner, which allows for the management of the economy and the social sphere of the city. Hence, the scientific and practical problems discussed in this article are highly important.

Over the past decade, there have been many international studies devoted to the analysis of the impact of a number of factors on the socioeconomic indicators of industrial centres. Such factors include the cost of industrial buildings (Ríos et al., 2017), the degree of innovation of the industrial capacities of the city's enterprises (Torugsa & Arundel, 2017), the energy efficiency of some industries (Cantini et al., 2021), and the environmental friendliness of waste produced by local industries and municipal services (Garbarino et al., 2020). One of the most significant works describing general theoretical aspects of the

problems related to the sustainable development of the municipal economy is the monograph by J. Enders and M. Remig (2016).

However, despite notable results of foreign colleagues with regard to the practical implementation of the policy of urban economy industrialisation in the modern context (Liu, 2019), setting the priorities of the municipal neo-industrial policy, and their attempts to anticipate structural economic changes in the 21st century (Aiginger & Rodrik, 2020), there is still a decline in scientific interest in the problems of industrial development of cities and territorial agglomerations.

More research dedicated to the latter issue has been conducted in Russia. A. V. Baranov et al. (2022) raised the issues of optimisation of the staff structure of municipal administrations in the context of creating tools for the development of the local economy and social sphere. I. F. Denisenko and E. N. Tovanchova (2023) identified the role and importance of municipalities in the public management of cities in the South of Russia. The authors described the experience of the most successful local administrations of the Rostov Region with regard to the solution of problems related to the socio-economic development of territories. M. A. Ovakimyan and A. B. Savchenko (2022) investigated the problems of developing "ecosystem" tools for monitoring the achievements of local industries in the context of decisions taken by the authorities.

Ateam of authors consisting of D.A. Endovitsky, Yu. A. Trestchevsky, P. A. Kanapukhin, and A. Yu. Kosobutskaya (2023) analysed the Russian practice of managing the innovative development of regions. They empirically confirmed the significant differentiation of municipal units in terms of the efficient functioning of industrial subsystems by many indicators. S. V. Palash (2020) proposed a method of multidimensional evaluation of the effectiveness of the projected

structure of the industrial development policy, including at the places where municipal facilities and services are localised.

The research of E. G. Kosheleva (2019), S.P.Kurdzhiev, and P.A. Bokhan (2022) was dedicated to the problems of harmonising the systems of state and municipal administration in the context of the development of economic and social relations based on the principles of partnership between industrial businesses, authorities, and the society. According to E. N. Strizhakova and D. V. Strizhakov (2020), the further development of the regions and cities of Russia is associated with the development and implementation of industrial policy of the appropriate scale.

I. I. Lazarev, A. A. Gevorgyan (2022), A. V. Polovyan, and A. F. Yaluner (2023) discussed the issues of sustainable development of economic entities and megapolises. The authors proposed to address these issues with the help of smart tools of industrial and other purposes. V. V. Oreshnikov, and Yu. S. Aitova (2019) use economic and mathematical modelling in relation to the management of municipal units.

Despite a wide range of studies (see publications listed above and works by other scientists) directly related to or adjacent to the subject of the proposed research, the conceptual foundation of the management of the economy and social sphere of the city does not appear to be fully developed. This fact influenced the choice of goals, tasks, and the working hypothesis of the study described in the abstract of this article.

The paper has a traditional structure: the description of the factual material and the used methods of scientific search are followed by the description of the main results and their discussion. These components of the paper are related to the scientific novelty of the study. The main part of the article is concluded with a section that provides opportunities for further discussion of the topic and related issues.

Research materials and methods

To verify the proposed hypothesis (see the abstract) and the possibility of adapting the scientific and methodological provisions to modern Russia, we

used laws and regulations of the Russian Federation, i.e. the Budget Code of the Russian Federation of 31.07.1998 No. 145-FZ, Federal Law of 09.02.2009 No. 8-FZ "On Providing Access to Information on the Activities of State Bodies and Local Self-Government Bodies", Federal Law of 27.07.2010 No. 210-FZ "On the Organisation of the Provision of State and Municipal Services", Federal Law of 6.10.2003 No. 131-FZ "On the General Principles of Organisation of Local Self-Government in the Russian Federation", Decree of the Government of the Russian Federation of 15.06.2009 No. 478 "On the Unified System of Information and Reference Support of Citizens and Organisations on Questions Concerning Cooperation with the State and Local Authorities by Means of the Internet", Order of the Government of the Russian Federation of 17.11.2009 No. 1993-r "On Approval of the Consolidated List of Priority State and Municipal Services Provided in Electronic Form". To test the proposed approach, it was necessary to use statistical data regarding Russian regions and cities¹, Taganrog in particular². In addition, we also had to analyse the documents of the city administration of Taganrog, including the charter of the city³, the approved development strategy⁴, the action plan for the implementation of this strategy⁵, and the official development forecast⁶.

¹ Regions of Russia. Social and economic indicators of cities. URL: https://rosstat.gov.ru/folder/210/document/13206

² The main indicators of the socio-economic development of the city of Taganrog. URL: https://tagancity.ru/page/analiz-pokazatieliei-sotsial-no-ekonomichieskogho-razvitiia-ghoroda-taghanrogha

³ Charter of the municipality "City of Taganrog". URL: https://dumataganroga.ru/regulatory/ustav.pdf

⁴ The strategy of socio-economic development of the municipality "City of Taganrog" for the period up to 2030 approved by the Decision of the City Duma of Taganrog of 26.12.2018 No. 527. URL: https://dumataganroga.ru/regulatory/resheniya-gorodskoy-dumy-goroda-taganroga/2018/2018-12-26-r-527.pdf

⁵ Action plan for the implementation of the strategy of socio-economic development of the municipality "City of Taganrog" for the period up to 2030. URL: https://tagancity.ru/uploads/documents/economy/analitika//Plan_meropriyatiy_po realizacii strategii.pdf

⁶ Forecast of socio-economic development of the city of Taganrog for the long-term period of 2019–2030 approved by the Decree of the Administration of the City of Taganrog of 07.11.2018 No. 2098. URL: https://tagancity.ru/page/postanovlieniie-administratsii-ghoroda-taghanrogha-ot-07-11-2018-2098

The applied approach to constructing estimates of the quasi-maximal likelihood of the level of industrial development using the theory of stochastic differential equations is based on the methods of probabilistic forecasting proposed by an outstanding mathematician from Donetsk, B. V. Bondarev (1997).

To conduct preliminary processing of economic and social indicators, it was necessary to use the method of financial analysis (Polovyan & Terentieva, 2022) and economic and statistical methods of assessment (Treshchevsky et al., 2022). The econometric methodology included the least squares method and the method of sequential regression analysis. The article by D. A. Endovitsky, Yu. I. Treshchevsky, P. A. Kanapukhin, and A. Yu. Kosobutskaya (2023) can serve as an example of a successful application of these methods.

Conceptual views on the management of the economy and social sphere of the city was systematised using the method of logical scaling and synthesis of scientific and practical knowledge (Aiginger & Rodrik, 2020).

Results

The modern methodology of socio-economic forecasting makes it possible to accurately predict the main indicators of economic and other

activities at the macro, meso, and micro levels. We will go by the ideas of B. V. Bondarev (1997), who laid the foundations of probabilistic and statistical methods for constructing point and interval forecasts based on the theory of random processes.

The scientific novelty of the study is the development of an applied approach to the construction of estimates of the quasi-maximal likelihood of values of socio-economic parameters using the theory of stochastic differential equations. This approach makes it possible to predict the level of industrial development of the cities of the Russian Federation, which can serve as the foundation for planning key socio-economic indicators and the development of conceptual views on the management of the economy and social sphere of administrative-territorial units.

In this case, the unknown parameter $\theta_0 \in \Theta \subset \mathbb{R}^k$ is the predicted level of industrial development of the city, which is estimated by the implementation of the random process $\{X(t), t \in [0,T]\}$, i.e. by the volume of production of goods and services by the local industry within the period of time t, most often associated with the end of the year, quarter, month, etc. Modelling was based on a stochastic differential equation (Table 1).

Table 1 Stochastic model describing the dynamics of the volume of production of goods and services by the city's industries

Model Element	Explanation and Applied Meaning
$\frac{dX(t)}{dt} = a(t, X(t), \theta_0) + \sigma(t)\eta(t/\epsilon),$ $X(0) = x_0$ (1)	Model (1) in the form of a stochastic differential equation with an initial condition of $X(0) = x_0$ for the volume of production of goods and services by the city's industries
$\frac{dX(t)}{dt}$	The rate of changing volume of production of goods and services by the local industries
$a(t,X(t),\theta_0)$	Average growth/decrease coefficient for the volume of production of goods and services by the city's industries
$\sigma(t)$	Root-mean-square risk coefficient of industrial development of urban areas
$\eta(t/\epsilon)$	A multiplier describing the stochastic nature of the industrial development of the city in the form of "economic white noise" with a small parameter $\boldsymbol{\epsilon}$

Source: improved and adapted by the author.

The improved model (1) allows determining the estimate of the quasi-maximum likelihood of the predicted level of industrial development of the city from the model trajectory θ_ϵ . The probability of absolute deviation of the predicted value θ_ϵ from the actual θ_0 depends on the value of the small parameter θ_0 , i. e.

$$P\{|\theta_{\varepsilon} - \theta_{0}| \le R(\varepsilon)\} \ge 1 - \gamma - p(\varepsilon). \tag{2}$$

Formula (2) includes value γ , which for applied problems of economics and management is 0.05, i.e. no more than 5 % error is allowed. Functions $R(\varepsilon)$ and $p(\varepsilon)$ infinitely approach zero when small parameter ε tends to zero. For each value ε , estimate (2) takes on a specific form.

As a result of adaptation of model (1) describing the dynamics of the volume of production of goods and services by the industries of the cities⁷ of the Southern Federal District, it was found that $\varepsilon = 10^{-9}$, which was used to obtain $R(\varepsilon) = 10^{-\frac{79}{2}}$ and $p(\varepsilon) = 0,1$. Theoretical inequality (2) has acquired an applied character:

$$P\left\{\left|\theta_{\varepsilon}-\theta_{0}\right| \leq \frac{1}{10^{39} \cdot \sqrt{10}}\right\} \geq 0.85.$$
 (3)

In inequality (3), a slight deviation was recorded between the predicted level of industrial development of the city θ_{ϵ} and its actual value θ_{0} . Moreover, the probability of this event is at least 85 %, which can be considered satisfactory for short-term forecasts.

The developed applied approach (1) – (2) to constructing estimates of the quasi-maximum likelihood of values of socio-economic parameters using the theory of stochastic differential equations was applied to one of the cities of the Southern Federal District, i. e. Taganrog. This city is located close to the border with the Donetsk People's Republic and its industries are fairly developed.

Financial and economic analysis showed that in Taganrog, which is second in the Rostov Region only to Rostov-on-Don in terms of housing construction, new forms of municipal mortgages are being actively introduced. However, the consequences of the coronavirus pandemic and other objective reasons affected the process of commissioning new apartment buildings (Fig. 1).

At least 100 thousand square meters of housing in apartment buildings are rented annually in Taganrog. However, the construction rates have slowed significantly since 2019.

One of the reasons is as follows: the population prefers individual housing, the share of which in Taganrog exceeds 30 % and is growing every year.

Financial and economic analysis showed that Taganrog ranks second in the Rostov Region in terms of the percentage of small and medium-sized businesses⁹, which employ more than a third

⁹ Regions of Russia. Social and economic indicators of cities. URL: https://rosstat.gov.ru/folder/210/document/13206

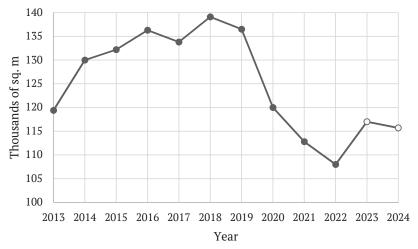


Fig. 1. Dynamics of commissioning municipal housing in Taganrog [forecast for 2023 and 2024 was made based on author's approach (1) - (2)]

⁷ Regions of Russia. Social and economic indicators of cities. URL: https://rosstat.gov.ru/folder/210/document/ 13206

⁸ The main indicators of the socio-economic development of the city of Taganrog. URL: https://tagancity.ru/page/analiz-pokazatieliei-sotsial-no-ekonomichieskogho-razvitiia-ghoroda-taghanrogha

of the working population of the city. In 2021, 44.8 thousand people were employed at small and medium-sized businesses, and in 2022 this figure increased by about 5 %. According to the applied approach to the construction of estimates of the quasi-maximum likelihood of the predicted values of the level of industrial development of Taganrog, the number of employees in small and medium-sized businesses in 2023 will be about 47 thousand people and in 2024 it is expected to fluctuate between 48 and 49 thousand people (Fig. 2).

Small and medium-sized businesses in Taganrog are represented by 97 % of individual entrepreneurs and microenterprises¹⁰. The financial indicators of

these economic entities are growing steadily with insignificant fluctuations (Fig. 3).

The economic policy implemented by the municipal administration of Taganrog is based on the expansion of the retail trade segment¹¹. Here, the position of local businesses is traditionally strong.

Between 2013 and 2022, retail trade turnover grew from 35.6 billion roubles to 66.9 billion roubles, in other words it almost doubled (Fig. 4).

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¹¹ The strategy of socio-economic development of the municipality "City of Taganrog" for the period up to 2030 approved by the Decision of the City Duma of Taganrog of 26.12.2018 No. 527. URL: https://dumataganroga.ru/regulatory/resheniya-gorodskoy-dumy-goroda-taganroga/2018/2018-12-26-r-527.pdf

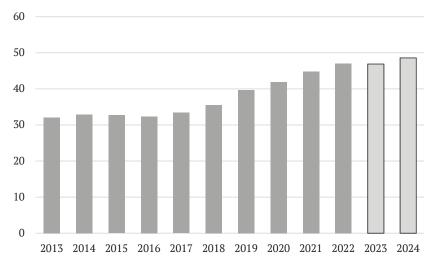


Fig. 2. Number of employees in small and medium-sized businesses in Taganrog, thousand people [forecast for 2023 and 2024 was made based on author's approach (1) - (2)]

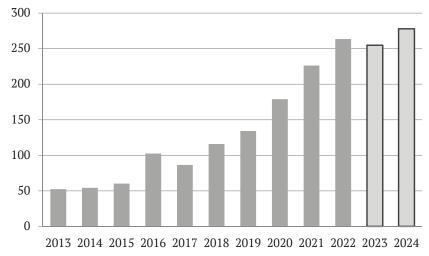


Fig. 3. Turnover dynamics of small and medium-sized businesses in Taganrog [forecast for 2023 and 2024 was made based on author's approach (1) - (2)]

¹⁰ The main indicators of the socio-economic development of the city of Taganrog. URL: https://tagancity.ru/page/analiz-

There was a slight decline in 2020, which was associated with the coronavirus pandemic. However, in 2021, the turnover increased by more than 20 %. The average annual growth was 7.5 %.

The economic policy of the city authorities to maintain high standards of public catering is also socially important and impacts the financial indicators (Fig. 5).

The low figures of 2020 can be explained by the peak of coronavirus pandemic. The more significant figure is an almost 25 % increase in turnover in 2022. The average annual increase dynamics is more than 5 %.

Results and discussion

The analysis showed that the municipal authorities of the cities of the Russian Federation

are taking consistent actions in order to change the specialisation of small and medium-sized businesses in the direction of their industrialisation¹². Urban economy needs manufacturing enterprises.

In addition, as a result of the economic policy conducted by city administrations large-sized businesses and small-sized business are tied together with subcontract relations, which have been actively developing due to the digitalisation of management processes. In relation to Taganrog, this applies to the industrial sectors of the city's economy: metallurgy, mechanical engineering, and the light and food industries¹³.

¹³ Charter of the municipality "City of Taganrog". URL: https://dumataganroga.ru/regulatory/ustav.pdf

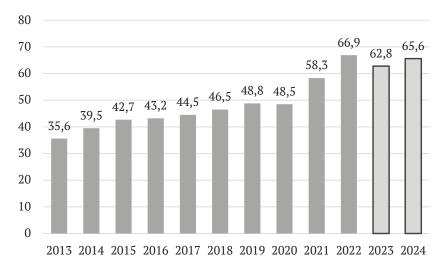


Fig. 4. Dynamics of retail trade turnover in Taganrog, billion roubles [forecast for 2023 and 2024 was made based on author's approach (1) - (2)]

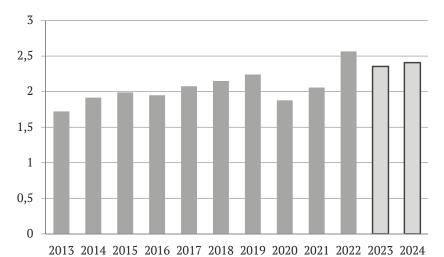


Fig. 5. Turnover of public catering enterprises in Taganrog [forecast for 2023 and 2024 was made based on author's approach (1) – (2)]

¹² Regions of Russia. Social and economic indicators of cities. URL: https://rosstat.gov.ru/folder/210/document/13206

Experience has proven that the sector of social entrepreneurship is actively developing in the industrial cities of Russia. It specialises on provision of services, and its areas of responsibility are health care, education, social services, culture, and ecology.

Russian universities offer education programmes in social entrepreneurship. Local authorities organise promotional events to improve the image of social business. Public organisations raise money for its needs and unite the efforts of self-motivated people.

The problems of economic policy in the field of retail trade in the cities of the Russian Federation include counterfeit and low-quality goods present on the consumer market, a

significant impact of the shadow business, a low degree of the development of wholesale trade, and a decline in consumer demand. Municipalities in many cities around the world face similar difficulties (Garbarino et al., 2020).

In our opinion, the economic policy conducted by city authorities should prioritise objectives aimed at the introduction of effective retail formats. The efficiency of family enterprises of commercial entrepreneurship, distribution centres of goods, and remote trade organisations is well-grounded (Aiginger & Rodrik, 2020). However, in our opinion, it is also necessary to provide support to the economically disadvantaged groups of population in terms of their purchase of socially significant goods and services.

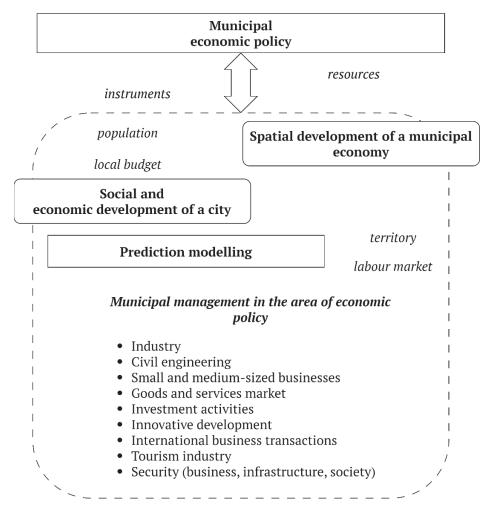


Fig. 6. A scheme describing the concept of economic and social management of the city with a due account for predicted industrial development and the implemented economic policy [adapted by the author in relation to Taganrog: The strategy of socio-economic development of the municipality "City of Taganrog" for the period up to 2030 approved by the Decision of the City Duma of Taganrog of 26.12.2018 No. 527. URL: https://dumataganroga.ru/regulatory/resheniya-gorodskoy-dumy-goroda-taganroga/2018/2018-12-26-r-527.pdf]

Retail markets and fairs in the city should also be maintained in a worthy condition. The quality of the sold products should be controlled. Despite the fact that our opinion to a certain extent agrees with the expert opinion (Liu, 2019), it is necessary to adapt international experience to the realities of Russia.

The above-mentioned problems can be overcome if they are solved comprehensively following a conceptual vector of action.

We propose to further discuss one of the key results of this study: the concept of managing the economy and social sphere of the city, which was developed with due account of the predicted industrial development and which ensures the implementation of the economic policy (Fig. 6).

For further discussion, it is important to note that the proposed scheme of the management concept consists of a financial and economic block, a social block, a spatial development block, a municipal management block, a budget formation block, and a block of resources and instruments. This conceptual foundation was improved by supplementing it with the functionality of prediction modelling.

The flexibility of the proposed concept scheme allows it to be adapted to the industrial cities of Russia. A prerequisite for the development of similar schemes for the industrial centres of the Donetsk People's Republic is the dissemination of the Russian experience in terms of preparing programme documents for socio-economic development by means of municipal management.

Conclusions

While conducting the research, the author developed an understanding of how the goals of the urban economic policy can be achieved. The obtained results are characterised by an increment of scientific and practical knowledge in the field of regional and industrial economy. It also contains elements of scientific novelty.

For example, one such element is the applied approach developed by the author to constructing estimates of the quasi-maximum likelihood of values of socio-economic parameters. This

approach is based on the theory of stochastic differential equations and makes it possible to predict a wide range of socio-economic indicators of the cities of the Russian Federation, at least in the short term. The collective estimate of the level of industrial development of the urban economy is the foundation for planning the economic policy of the municipality. The main result of this study is the proposed concept of administrative actions related to the economy and social sphere of the administrative-territorial unit.

It was substantiated that among the efficient components of the municipal management are comprehensive support of urban investment projects; centres of advanced training and retraining of the required labour forces (local and newly-arrived), including administrative employees; instruments helping to promote the principles of public-private, public-municipal, and social partnership; the legal and regulatory framework for labour safety; economic incentives for energy saving and infrastructure modernisation; introduction of environmental science into the municipal economy; and methods of creating comfortable urban environment.

The economic policy implemented by a city's authorities requires a number of strategic initiatives to form a modern consumer market in the city, which involve:

- creating an electronic digital register of facilities that make up the consumer market of the municipal urban district;
- developing an interactive map of wholesale
 and retail trade facilities, consumer services
 enterprises, and catering establishments;
- creating an electronic trading platform for the sale of goods and services by local manufacturers;
- organising the logistics infrastructure of Internet commerce with a territorial network of pickup points;
- improving the service of providing information about services, goods, shopping facilities, and municipal catering points.

Despite the growing turnover of small and medium-sized businesses in the cities of the Russian Federation, the author recommends continuing the practice of addressing the most common problems arising from:

- an increase in non-tax payments;
- a reduction in effective demand in the consumer market;
- insufficient number of suitable land plots with the necessary infrastructure and energy resources;
- a shortage of personnel with the required qualifications;
- difficulties in interacting with monopolistic enterprises;
 - unfair competition with shadow businesses;
- low interest in economic activities among young people;
- insufficient opportunities for obtaining microloans by small and medium-sized businesses.

The industrial development of Russian cities is hampered by social problems. Some social groups do not have access to mortgage lending for housing construction.

In addition to the construction of houses, builtup areas should also be developed. Management of the economy and social sphere of the city in correlation with industrial policy, can help solve housing problems by:

- improving the overall state of the municipal housing;
- bringing the housing to modern quality standards that ensure comfortable living conditions;

- reconstructing the urban systems of engineering, communal, and social infrastructure;
- creating conditions for the development of infrastructure facilities;
- demolishing substandard housing and building high-quality apartment buildings in its place;
- resettlement of residents of old housing and providing them with comfortable apartments at the expense of the developer;
- reconstructing buildings that are historical and cultural monuments and ensuring their proper care.

Depending on the transformation of economic policy priorities, we recommend analysing its features and assessing its effectiveness under local conditions. In our opinion, further research in this area can be devoted to further optimisation of the changing structure of the mechanism of administrative actions. It is important to use key aspects of the industrial development of the city to identify reserve capacities allowing the municipality to adapt to the new economic and social relations.

Conflict of Interest

The author declares the absence of obvious and potential conflicts of interest related to the publication of this article.

References

- 1. Aiginger, K., & Rodrik, D. (2020). Rebirth of Industrial Policy and an Agenda for the Twenty-First Century. *Journal of Industry, Competition and Trade*, *20*(2), 189–207. https://doi.org/10.1007/s10842-019-00322-3
- 2. Baranov, A. V., Tagaev, A. V., & Bryukhanova, N. V. (2022). Optimization of structure and staffing of local self-government bodies as a tool for socio-economic development of municipal education. *State and Municipal Administration*. *Scientists Notes*, *3*, 9–16. (In Russian). https://doi.org/https://doi.org/10.22394/2079-1690-2022-1-3-9-16
- 3. Bondarev, B. V. (1997). Evaluation of calculated influences in parabolic systems, L 1-approach. *Random Operators and Stochastic Equations*, *5*(4), 357–369. https://doi.org/10.1515/rose.1997.5.4.357

- 4. Cantini, A., Leoni, L., De Carlo, F., Salvio, M., Martini, C., & Martini, F. (2021). Technological energy efficiency improvements in cement industries. *Sustainability (Switzerland)*, *13*(7). https://doi.org/10.3390/su13073810
- 5. Denisenko, I. F., & Tovanchova, E. N. (2023). The role of local government in the system of public authority of the Russian Federation: best practices of the Rostov region. *State and Municipal Administration*. *Scientists Notes*, *1*, 11–17. (In Russian). https://doi.org/https://doi.org/10.22394/2079-1690-2023-1-1-11-17
- 6. Enders, J., & Remig, M. (2016). *Theories of Sustainable Development*. Routledge.
- 7. Garbarino, E., Orveillon, G., & Saveyn, H. G. M. (2020). Management of waste from extractive industries:

- The new European reference document on the Best Available Techniques. *Resources Policy*, *69*. https://doi.org/10.1016/j.resourpol.2020.101782
- 8. Kosheleva, E. G. (2019). Economic prerequisites of interaction of subjects of intellectual entrepreneurship and the state in the framework of realization of projects of public-private partnership. *Bulletin of Donetsk National University. Series B. Economics and Law*, *3*, 84–92. (In Russian).
- 9. Kurdjiev, S. P., & Bokhan, P. A. (2022). Development of proposals to improve the methodology of monitoring socio-economic development of the Rostov region. *State and Municipal Administration. Scientists Notes*, *4*, 12–18. (In Russian). https://doi.org/https://doi.org/10.22394/2079-1690-2022-1-4-12-18
- 10. Lazareva, I. I., & Gevorgyan, A. A. (2022). Innovative nature-saving technologies "smart transportation" in the system of sustainable management of megapolis. *State and Municipal Management. Academic Notes*, *1*, 21–28. (In Russian). https://doi.org/https://doi.org/10.22394/2079-1690-2022-1-2-21-28
- 11. Liu, E. (2019). Industrial policies in production networks. *Quarterly Journal of Economics*, *134*(4), 1883–1948. https://doi.org/10.1093/qje/qjz024
- 12. Oreshnikov, V. V., & Aitova, Y. S. (2019). Application of economic and mathematical modeling methods in the development of the municipal development strategy. *Issues of Territorial Development*, *3*(48), 1–13. (In Russian). https://doi.org/https://doi.org/10.15838/tdi.2019.3.48.3
- 13. Ovakimyan, M. A., & Savchenko, A. B. (2022). "Ecosystem" of public power interaction: etiquette of managerial decision-making. *State and Municipal Administration. Scientists Notes*, *3*, 49–54. (In Russian). https://doi.org/https://doi.org/10.22394/2079-1690-2022-1-3-49-54
- 14. Palash, S. V. (2020). Estimation of systemic efficiency of structural industrial policy in the Russian Federation. *Economics and Entrepreneurship*, 12,

- 240–250. (In Russian). https://doi.org/https://doi.org/10.34925/EIP.2021.125.12.047
- 15. Polovyan, A. V., & Terentyeva, M. Y. (2022). Problematika investitsionno-innovatsionnogo razvitiya ekonomiki vysokho-technologicheskoy sindustrii: theoretical basis. *Bulletin of Donetsk National University. Series B. Economics and Law, 2*, 240–249. (In Russian).
- 16. Polovyan, A. V., & Yaluner, A. F. (2023). Assessing the impact of smart-industry tools on sustainable enterprise development. *Management Accounting*, 7, 160–168. (In Russian). https://doi.org/https://doi.org/10.25806/uu72023160-168
- 17. Ríos, A. M., Benito, B., & Bastida, F. (2017). Factors Explaining Public Participation in the Central Government Budget Process. *Australian Journal of Public Administration*, *76*(1), 48–64. https://doi.org/10.1111/1467-8500.12197
- 18. Strizhakova, E. N., & Strizhakov, D. V. (2020). Realization of industrial policy at the municipal level: problems and opportunities. *City Management: Theory and Practice*, *4*(38), 37–42. (In Russian).
- 19. Torugsa, N. (Ann), & Arundel, A. (2017). Rethinking the effect of risk aversion on the benefits of service innovations in public administration agencies. *Research Policy*, *46*(5), 900–910. https://doi.org/10.1016/j.respol.2017.03.009
- 20. Treschevsky, Y. I., Kosobutskaya, A. Y., Garin, L. K., & Rodnin, M. N. (2022). The impact of sanctions on regional economies: general and special. *Region: Systems, Economics, Management, 3*(58), 36–46. (In Russian). https://doi.org/https://doi.org/10.22394/1997-4469-2022-58-3-36-46
- 21. Yendovitsky, D. A., Treschevsky, Y. I., Kanapukhin, P. A., & Kosobutskaya, A. Y. (2023). Empirical analysis and forecasting of dynamics of innovative development of Russian regions. *Proceedings of Voronezh State University. Series: Economics and Management*, 1, 51–64. (In Russian). https://doi.org/https://doi.org/10.17308/econ.2023.1/10932

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Формирование концепции управления экономикой и социальной сферой города с учетом прогнозирования уровня промышленного развития

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Предмет. Теоретические, методические и практические проблемы управления экономикой и социальной сферой города с учетом прогнозных значений уровня промышленного развития. **Цель.** Обоснование научно-методических положений концептуального характера применительно к управлению городским хозяйством и решению социальных задач местного масштаба с помощью прогнозирования уровня промышленного развития.

Методология. Выдвигаемая гипотеза состоит в том, что наличие адекватного прогноза уровня промышленного развития города позволяет планировать предстоящие изменения основных экономических и социальных показателей муниципального хозяйства. Теоретической основой авторской гипотезы послужил метод логического масштабирования и синтеза научно-практических знаний. Статистические исследования проведены с применением методов эконометрического и финансового анализа на базе социально-экономических показателей промышленных городов Южного федерального округа России за период с 2013 по 2022 г. Формирование прогнозов на последующие временные периоды опирается на прикладной подход к построению оценок квазимаксимального правдоподобия уровня промышленного развития, что осуществлено с помощью теории стохастических дифференциальных уравнений, базирующихся на методах вероятностного прогнозирования.

Результаты и обсуждение. В ходе исследования обосновано, что муниципальный менеджмент, способствуя производству материальных благ, служит задачам гармонизации социально-экономических отношений между местной властью, бизнесом, общественными организациями и отдельными индивидуумами, находящимися во взаимосвязи с уровнем промышленного развития города. Разработан прикладной подход к построению оценок квазимаксимального правдоподобия значений социально-экономических параметров, позволяющий прогнозировать уровень промышленного развития городов Российской Федерации. Точечные и интервальные прогнозы служат основой для планирования хозяйственных и иных показателей. Предложена концепция управления экономикой и социальной сферой административно-территориальной единицы. Обязательные социально-экономические блоки концепции дополнены функционалом прогнозного моделирования, перспективного для обсуждения, критического осмысления и последующего совершенствования. Будущие изменения в местной промышленной политике подлежат анализу и оценке эффективности с позиций структурной модернизации экономико-организационного механизма управления городским хозяйством и социальной сферой территории.

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