

Forecasting the Development of the Subsidized Region

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Abstract — The results of research on forecasting problems of the main indicators of socio-economic regional development are proposed in this article. Keen interest in these issues in modern conditions is determined first of all by the increased need for forecast solutions. The factual information for reliable substantiation of such decisions is not enough, it is necessary to use expert forecasting. The article also presents an approach which lays the foundation for forecasting and provides a capability for combined forecast calculations.

Keywords — forecast, the main indicators of socio-economic development, modeling, expert preferences, multi-level forecast calculations.

1. INTRODUCTION

After some rethinking of the new economic conditions, planning takes an important place in the problem of state regulation of the regional economy. It is now realized that only the forecast as a probabilistic idea of the prospects for the studied object in the future allows managers of different levels to see the main orientations of the changes taking place. This gives them the opportunity to make informed decisions because any management decision is ultimately a kind of reaction to a predictive vision of the future of a managed object. In addition, thanks to forecasts, managers are able to timely assess undesirable trends and threats and therefore take proactive measures to avoid a "shock of the future".

The question of combination of plan and market is still debatable despite the fact that in many developed countries various types of planning have been long and successfully applied. Almost all without exception economic entities want the regions in which they live and function to develop steadily and dynamically [11]. However, the administering subjects of the territory forget about the need for planning and control which help to keep the region entrusted to them on the right track. Moreover, the socio-economic development of the regions is subject to various fluctuations including short-, medium- and long-term ones. In the short term (up to one year), fluctuations are associated with changes in supply and demand under the influence of seasonal and other similar

factors. In the medium term (from 5 to 7 years), the region's economy goes through four stages in its development including the rise, crisis, depression and revival. In the long-term cycle by N.D. Kondratyev (about fifty years) ups and downs in the socio-economic development of the region can be seen. At the same time, interregional, intersectoral and international competition can grow very much.

At present, the range of forecasting tasks has significantly expanded not only at the micro but also at the macro level. At the macro level the forecast became the means of determining the main characteristics, priorities and directions of state economic and social policy. Moreover, in modern conditions at the state and regional levels predictive developments began to dominate the planned ones. This is, inter alia, supported by Federal Law No 115 "On State Forecasting and Programs for the Social and Economic Development of the Russian Federation", as well as the Message of the President of the Russian Federation Vladimir Putin to the Federal Assembly of the Russian Federation of December 12, 2013 in which the need for scientific development of forecasts is constitutionally guaranteed.

Stricter requirements for the validity and reliability of forecast estimates were the logical consequence of strengthening the role of forecasting in solving modern management tasks. Achievement of these requirements can be facilitated by the use of a multilevel combined model built on the basis of synthesis of the adaptive approach, simulation modeling and expert expectations [1, 2].

As noted in the strategic guidelines submitted by the Ministry of Economic Development and Trade of the Chuvash Republic the main objectives of the socio-economic development of the Chuvash Republic in the medium term are:

1) improving the life quality of the population at higher than the Russian average speed, creating an effective system of the provision of social services, reducing the proportion of the population with incomes below the subsistence level;

2) creating a model of the republic's economy which has a long-term potential for dynamic growth, a diversified production structure, a significant export potential, an innovative receptivity and an orientation towards the social needs of the population.

The modern economy generates processes with such a complex dynamics that the identification of its regularities by the apparatus of modern prognostics is often an unsolvable task. The improvement of this apparatus, first of all, needs new ideas and new approaches on the basis of which it is possible to implement mechanisms and ways of reflecting the dynamics formed under the influence of effects and the possibility of their appearance in the future is not found in the database of the historical period [9].

At the same time, trends of the future grow out of the past. This fact cannot be ignored and therefore it must also be reflected in the forecast trajectory. There is a clear contradiction the overcoming of which will contribute to a new way of looking at forecasting which is based on objective trends and subjective expectations [12].

Assessment of opportunities to achieve the goals requires comprehensive accounting of dynamics of the main indicators of the region's economy, reflecting its potential for reproduction, development and influence on the social field. In this regard statistical data [4,5,6] for the period from 2015 to 2017 were used (Table 1).

TABLE 1. THE MAIN INDICATORS OF THE SOCIO-ECONOMIC DEVELOPMENT OF THE CHUVASH REPUBLIC FOR 2015-2017

No	Indicators	Million rubles in the prices for the corresponding years		
		2015	2016	2017
1	Gross regional product	250 408,9	259 625,2	272 371,2
2	Output of goods and services by main branches of industries	484 384,7	502 212,4	526 868,0
3	Volume of investments (in fixed capital) under all sources of funds	33 735,3	31 784,6	32 114,9
4	Incomes of the region	29 206,7	33 128,4	33 615,9
5	Incomes of the population	271 561,4	263 277,6	282 233,6
6	Expenditures and savings of the population	275 847,9	265 958,4	281 233,6

The developed schemes of multidimensional forecasting calculations are quite applicable for solving real tasks of a rather large size. First of all, forecasting of the socio-economic development of the regions should be attributed to the class of similar tasks [10]. The number of various indicators, the expected values of which must be calculated in solving this task, is so great that the attempt to construct a single model reflecting the interaction between all these indicators would hardly be successful. In such a situation it is more appropriate to use a multi-stage scheme for carrying out multilevel forecasting calculations. Under this scheme it is possible to group the indicators on any ground (the sector of economy, the industry, the source of income, etc.) which makes it possible

to significantly reduce the scope of the task being solved and summarizes it to a sequence of smaller tasks.

The multidimensional combined forecasting model assumes the use of a deterministic matrix predictor. It makes sense to build this predictor in those situations when the possibility of using statistical methods of modeling is completely excluded. An example is the situation in which the researcher has only two or three observations. The model is constructed in the condition that the gain of any of the indicators is formed under the influence of all the others being as it were the total value. And each indicator separately has little influence on the model and there is no prevailing indicator among them.

The main advantage of this approach is that with its help it is possible to carry out calculations for multidimensional series of dynamics even in the case when the researcher has observations for two periods only. The fact is, the statistical reliability of such forecasting calculations is not checked and relies mainly on the assumption that even with a change in the nature of the dynamics of the predicted processes the structure of the predictor itself, as a rule, changes insignificantly. As experience of forecasting calculations shows application of this model is more preferable to usual calculations using growth rates in which interaction between simulated indicators is not taken into account at all.

The conventional statistical methods of modeling do not allow to find an acceptable forecast estimate according to a short time series of observed values (three numbers) [8]. In this connection, there is a predictor in the calculation scheme which is the means of eliminating these problems and allows us to make forecast estimates not by individual indicators but simultaneously by the set of all indicators of one level in interrelation with each other. The results of calculations are presented in Table 2.

TABLE 2. FORECAST ESTIMATES OF THE MAIN INDICATORS OF THE SOCIO-ECONOMIC DEVELOPMENT OF THE CHUVASH REPUBLIC FOR 2018 (IN MILLION RUBLES)

No	Indicators	Formal forecast	Intuitive forecast	Combined forecast	
				variant I	variant II
1	Gross regional product	286609,7	288612,7	289035,6	290042,6
2	Output of goods and services by main branches of industries	290042,6	558285,1	559055,3	561051,2
3	Volume of investments (in fixed capital) under all sources of funds	51485,5	51849,2	51954,9	5 000,5
4	Incomes of the region	33395,5	33910,5	33859,6	34553,9
5	Incomes of the population	304812,3	305931,0	305995,1	306505,7
6	Expenditures and savings of the population	302912,3	304331,0	304458,3	305205,7

The combined trajectories I and II as well as the expert trajectory differ significantly from the calculated trajectory: the growth rates of the latter are much higher. This is obviously due to the fact that experts in their expectations were guided by a reduction in the rate of inflation while in the model projections the inflation rates of the last periods were reflected. This difference is the essence of multi-level combined forecasting which makes it possible to take into account those trends that have not yet manifested themselves in the economic reality.

CONCLUSION

So, having analyzed these indicators it can be concluded that the developed forecasting apparatus can indeed be used in the practice of mass calculations that take place when forming variants of the socio-economic development of the region. Moreover, the application of this apparatus introduces elements of the system approach into forecasting calculations and this streamlines the entire multi-stage process and significantly increases the efficiency of solving regional forecasting tasks.

As it is known, the theoretical and applied aspects of modeling qualitative variables began to be intensively developed only in the last decade. The apparatus of such modeling was just the basis for realizing the idea of forecasting expert preferences.

The models based on the idea of combining adaptive principles and expert expectations are of particular interest. The constructed computational schemes of the developed models are an effective tool for carrying out complex forecasting calculations. Their verification at the regional level has confirmed the universality, flexibility and reliability of this tool.

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