The Amur region volumes housing theoretical substantiation and forecasting

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Abstract. The article substantiates the need to determine the target volumes of housing construction in the Amur Region, taking into account the investment development attractiveness, the regional authorities’ policy, the land resources’ availability, engineering networks, the availability of building materials under various scenarios of economic development. The work involves a medium-term forecasting model for the regional housing market development with a 3-year planning horizon. The problem in obtaining quantitative estimates of market development (the price ratio, housing demand and supply) when changing the planned volume of housing commissioning and macroeconomic indicators has been solved. The data obtained as a result of the study can be used in developing the socio-economic policy of the Federation subject, forming a regional budget for the planning period, developing and implementing programs to provide affordable and comfortable housing for the population and the housing development in the region. The forecasting results on the Rostov Region and the Stavropol Territory examples were tested by the authors and reported in the framework of the International Scientific and Technical Conferences “Construction and Architecture: Theory and Practice of Industry Development” (CATPID-2018, October 8-12, 2018, Nalchik) and “Construction and architecture: theory and practice of innovative development” (CATPID-2019, October 1-5, 2019, Kislovodsk).

Introduction
The transition to the market model development, including the management economic system transformation and the new socio-economic relations development has led to the situation of housing shortages in the Russian regions. A low level of average housing provision per inhabitant of Russia in the amount of 25.7 m² (32nd place in the world and one of the last in Europe [1, p. 131]) against the background of a rather poor quality of housing commissioned (about 40% of the population dissatisfied with their housing conditions [2]) have led to the increased concentration of the state leaders’ attention over the past few years to the problem of accelerating the pace of housing construction and improving the quality of housing being built in the constituent entities of the Russian Federation. In the last decade, significant regulatory and organizational and economic measures have been taken to stimulate the regional authorities and businesses to solve this problem [3], the commissioned housing target growth volumes have been determined - by 2020 this value should reach 150 million m² [4, p.65], the joint work of the Ministry of Construction and Housing and Communal Services of the Russian Federation and the Ministry of Economic Development of the Russian Federation is planned, and in the east of the country with the assistance of the Ministry of the Russian
Thus, the main direction of the state housing policy is the implementation of environmentally friendly technologies in the primary market, stimulating the availability and development of the production of building materials through the introduction of energy-saving and environmentally friendly technologies in the period up to 2025 years are very important in this area. Thus, the main direction of the state housing policy is the implementation of the priority national project “Affordable and Comfortable Housing for Russian Citizens”, the tasks of which are aimed at creating conditions for the development of housing construction in the region, balanced stimulation of demand and supply on the housing market [5].

In the course of the Amur Region state program implementation “Providing affordable and high-quality housing to the population of the Amur Region”, legal and organizational foundations for the implementation of the state housing policy were established, its priorities were identified, and its implementation mechanisms were developed [6]. However, a number of factors identified during the study, such as poor documentation elaboration on urban planning and zoning at the regional and local levels, lack of clear certainty in urban planning policy; inaccessibility of land for the developers; an excessively regulated and extremely cumbersome system for issuing initial permits for the construction implementation, obtaining technical conditions for connecting to public infrastructure and commissioning; the lack of prepared land for integrated housing development with infrastructure support; lack of free capacity for heat and electricity for the newly commissioned facilities in a number of municipalities; high deterioration (up to 60-70%) of production capacities of the majority of existing enterprises in the building materials industry; low availability of credit resources for construction organizations did not allow to achieve the program targets. In terms of housing commissioning, the Amur Region took a modest 5th place among the Far Eastern Federal District regions and one of the last places in the Russian Federation. The increased attention of the President of the Russian Federation, the Government of the Russian Federation, the scientific and educational community, the media and the public to the problem of increasing the pace of housing construction, the priority of this indicator in assessing the regions and municipalities administrations activities results stimulated the Amur Region leadership to find the ways to increase the housing commissioning volume, increase the solvent demand for regional housing development.

Purpose and research methods
The aim of the work is to study the regional primary market development dynamics for the residential real estate under various scenarios of macroeconomic development and change in target volumes of housing commissioning compared to the previously planned ones. The objectives of the study are:
- collection and processing of the source data for theoretical justification and the construction target volumes forecasting and the region housing commissioning;
- identification of the factors influencing the target indicators achievement of regional development;
- theoretical justification for the need for forecasting the housing construction in the region;
- the formation of various scenarios for the regional primary market development for residential real estate;
- substantiation of the chosen development scenario from the point of view of ensuring a balanced market and the necessary profitability of regional development.

The object of the research is the primary housing market in the Amur region.

The paper uses the main provisions of the medium-term forecasting model for the primary housing market development with a planning horizon of 3 years and a step of 1 year and statistical research methods. The model includes such indicators as volumes of housing construction and commissioning of the housing, presented and actual demand, price dynamics in the primary housing market, taking
into account the projected changes in macroeconomic and industry regional indicators, the state of the market in relation to supply and demand at each forecasting step.

The problem statement

The Amur Region in 2013 reached its historic maximum - 363.5 thousand m² of housing was built and commissioned. After this, there is a tendency for a constant annual decline in housing construction: 2014 - 343.5 thousand m², 2015 - 261.3 thousand m², 2016 - 221.2 thousand m², 2017 - 181.6 thousand m², 2018 - 158.9 thousand m² [7, p. 131]. This state of the issue, in our opinion, does not allow the regional authorities to rely on achieving the Program targets - an increase in housing construction to 275 thousand m² by 2024 and the level of housing for the Amur Region population up to 25.4 m² of total housing area per 1 person by 2025 [6]. In addition to the above, the supplying factors affecting the possible volume of housing construction, a group of demand factors has no less impact:

1. The market trends similar to many other regions of the Russian Federation are observed in the Amur Region, but with the longest inertial period. The change consequence in market conditions after the rise in 2012-2013 was a decrease in the development investment attractiveness in subsequent years. In recent years, with the exception of 2018, the dynamics of prices in the primary housing market turned out to be negative [7, p.206], the final profitability of investment and construction projects dropped sharply, and not all potential developers were ready for such a situation.

2. The real disposable cash income of the Amur Region population in the analyzed period decreased (99.1% in 2016, 100.5% in 2017 and 98.8% in 2018 compared to the previous period, respectively) [7, p. 55], the housing demand and takeover volume were quite low. The average price in the primary market only since 2018 has a tendency to some increase. As a result, there is a decrease in the pace of housing construction, which does not allow to realize the declared targets for housing commissioning.

The paper proposes to test the possibility of increasing the volume of housing construction by the demand factors [8-15]. It is necessary to obtain the quantitative estimates of the regional primary housing market development with a change in both macroeconomic indicators and planned volumes of housing commissioning. This possibility is presented by the medium-term forecasting methodology for the local residential real estate market [16, p.1] using the example of forecasting the Moscow market indicators dynamics in 2011-2016 under various scenarios of macroeconomic development. Later it was improved, a retrospective verification of the forecasting results by actual data was carried out, positive results were obtained [17, p. 91]. In the course of the study, the model was supplemented by the regional factors and trends.

Initial data

The Amur region market was adopted as the local market for residential real estate. The selected analysis period (2016-2019) and the forecast period (2020-2022) are justified by the periods of the federal target program “Housing” for 2016-2020 [5] and the state program of the Amur Region “Providing affordable and high-quality housing for the population of the Amur Region” (as amended on December 30, 2019) [6]. Four possible development scenarios are proposed: - scenario No. 1 - corresponds to an optimistic government forecast for development; - scenario No. 2 - parameters exceeding the optimistic scenario are specified; - scenario No. 3 - realistic scenario; - scenario No. 4 - pessimistic development scenario.

The basic macroeconomic data changed according to the scenarios and calculation options, justified in the author’s dissertation research [18, pp. 56-59], are given in Table. 1 and for the branches - in Table. 2.

Table 1. Macroeconomic inputs for four scenarios.
The results of the calculations performed during the study are presented below. In accordance with the policy indicators announced by the regional authorities and the stable macroeconomic indicators,
including relatively low inflation, a slight increase in real disposable cash incomes of the population and the stability of the national monetary unit, in the Amur Region there will be a slight decrease in prices and some mismatch in supply and demand in the primary market real estate (Figure 1, Option 1). This trend, although it has positive features, is not optimal, even in the face of a slight increase in household incomes and lower mortgage rates.

Figure 1. The primary housing market indicators’ dynamics according to the scenario No.1

It seems possible to correct the situation within the framework of the government forecast by increasing the target volume of housing commissioning in the period under review (Figure 1, Option 2). Increased supply will reduce prices and create additional conditions for the growth of solvent demand. However, this situation cannot continue for a long time, because it does not provide any investment attractiveness to the regional development and in the long run, most likely, will not allow investors to develop this market segment. Option 3 of the scenario under consideration has the opposite effect compared to the Option 2.

An extremely optimistic development scenario (Scenario No.2) with basic volumes of housing commissioning is characterized by positive dynamics of macroeconomic indicators that affect the demand (Fig. 2, Option 1). There is still an imbalance in supply and demand on the market, but it is already not so obvious within the planning horizon and has a pronounced downward trend. In our opinion, Option 2 is the most interesting forecasting option in order to coordinate supply and demand under the scenario. In this case, all four development indicators are achieved: housing construction volumes exceed the stated indicators, housing prices are falling, demand is growing amid favorable
macroeconomic situations, the mismatch of supply and demand in the housing market is minimal. However, this option is not very obvious due to both the development low attractiveness and the declared macroeconomic indicators’ achievement.

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**Figure 2.** The primary housing market indicators’ dynamics according to scenario 2

The most likely part of the implementation is scenario No.3. Negative growth rates of the real disposable incomes of the region's population in the context of stable inflation in the amount of 5.0-5.5% per year with the ruble rate forecast by the Central Bank of the Russian Federation and the volume of planned mortgage loans will lead to a decrease in solvent demand for housing. It is possible to correct this development option by increasing the volume of housing introduced. The dynamics of such development scenarios is predicted in options 1-3 depending on the decision made regarding the target volume of housing commissioning in the region (Figure 3).
The primary housing market indicators’ dynamics according to scenario 3

The dynamics of indicators under an extremely negative development scenario (scenario No. 4) will lead to even greater discrepancy between the supply and demand in the regional primary housing market, the lack in investment attractiveness of development in comparison with scenario No. 3 and will indicate the need and feasibility of using active measures to regulate the region’s economy.

Summary

Thus, the dynamics of macroeconomic parameters according to the Option 2 of scenario No.2 is the most preferable, because it will balance the market and provide the necessary profitability of the regional development. However, the execution of such a scenario is considered with high probability as unrealizable. Scenario No. 1 and scenario No. 4 for all the options are considered to be unlikely. According to the scenario No. 3, it is proposed to use the Option 2, which implies an increase in housing commissioning by 2022 in the Amur Region to 221 thousand m², an average annual decrease in prices on the regional primary housing market by 3-5% and an increase in solvent demand in corridor 2 -3.5%.

The obtained data can be used in developing the socio-economic policy of the Federation subject, forming a regional budget for the planning period, developing and implementing programs to provide affordable and comfortable housing for the population and the development of housing in the region.

Figure 3. The primary housing market indicators’ dynamics according to scenario 3
The forecasting results on the example of the Rostov Region and the Stavropol Territory were tested by the authors and reported in the framework of the International Scientific and Technical Conference "Construction and Architecture: Theory and Practice of Industry Development 2018" (CATPID 2018, October 8-12, 2018, Nalchik) [20] and the International Scientific and Technical Conference "Construction and Architecture: Theory and Practice of Innovative Development" (CATPID-2019, October 1-5, 2019, Kislovodsk) [21].

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