===== FINANCE PROBLEMS =====

Evaluation of the Mid-Market Investment Returns in Real Estate Development When Forecasting the Housing Market

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Abstract—The paper is devoted to estimating the midmarket running annual revenue of investments in the development of residential real estate under socioeconomic and town planning of the housing sphere. It provides variants of midmarket running annual revenue of investments in the development of residential real estate taken from different sources. The obtained coefficients allow us to shift from estimating the running annual return on investment in relation to the cost of construction to estimating this return in relation to the total investment cost.

IMPORTANCE, OBJECT, AND TASKS OF THE STUDY

There is a minimum of three factors that determine the importance of the scientific development of the methodology in the projection of the housing markets.

1. Planning the volumes of the construction, introduction, and sale of housing is a constant practical task both for the bodies of governmental and municipal control and for commercial participants of the real estate market all over the world that is in interests of the socioeconomic development of territories, the provision of the stable financial growth of the industry and the extraction of current returns by its participants. In particular, in, e.g., the United States, the agency Standard & Poor's publishes the index of average weighted prices of housing or the HPI (Case–Shiller House Price Index) counted based on monitoring the house price in mortgage of the Fannie Mae and Freddie Mac companies. This index serves as a projection management index not only for the business community, but also for the bodies of executive power, including The Office of Federal Housing Oversight, etc.

2. The analysis of the housing markets situation is an informative index and the factor of projection of the national macro economy and economies of regions in broad terms. For example, the above-mentioned HPI index is used by all professional players of the financial market for analyzing the power of American housing market trends, which makes it possible to forecast the dynamics of the economy as a whole. In the international currency market, indices above the expected trends are viewed as a positive (bullish) direction of the dynamics of the US dollar (USD) to the basic currencies, and indices below the expected trends denote a negative (bearish) trend.

3. Finally, in market economies, there is a need to overcome the high dependence of national and transnational banking systems on crises in housing markets, i.e., the fundamental intercommunication of the housing markets and the global financial market now needs not so much proof as further deep investigation. That is why, for example, the Federal Reserve System of the United States has its own investigation group for analyzing real estate markets. In the American economic science, the development of this direction does not stay still. For example, R. Shiller (along with Karl Case, the author of the methodology of calculating the above-mentioned indices and 2013 Noble Price winner in Economics, who in his 2005 paper was the first to declare the threat of a crisis in the housing market) devoted a special chapter in his 2013 monograph to the comparative study of speculative bubbles in the stock and real estate markets [1].

In Russia, the methodology of the scientific projection of the housing market was started more than 20 years ago, including the participation of the authors of the present work [2]. Specifically, in [3], it was shown that, apart from other factors, market cycles of rising and falling rates of housing construction and sales depend on changes in the current yearly returns of the development companies (the ratio of total return from the sale of premises to the total cost of the construction in the portfolio of companies in this year's projects). It is proposed to estimate the index of the reve-

nue position of investments (I_r) in the company's different operations as follows:

$$I_r = R_s/C = (R - C)/C = R/C - 1 = P_a/(E_b C_{ac}),$$

where R_s is return from sales within investment projects, rubles; R is revenues from sales within investment projects, rubles; E is expenditures on implementation of projects; P_a is average specific price of real estate in the current period, RUB/m²; E_b is the average specific cost of acquisition or creation of real estate in the basic period, RUB/m²; C_{ac} is coefficient of additional costs (correcting coefficient that reflects the difference between the gross and net returns). This index can be expressed as a percentage of the annual return, i.e., $I_r = (P_a/E_b C_{ac}) - 1) \times 100$, percent per year.

Here, the number of projects from which the company receives returns and those where expenditures prevail is different each year because the scales and data of projects are different. The revenue of each separate developer project is the summary income for the period from the beginning of investments down to total sale of the object (this period may be more or less than a year). In this, the positive and negative flows are developing with a shift in time. That is why the calculation of a concrete developer project should be prolonged to the entire duration of the project; then, this index is transformed into the annual average. It is shown in [4] that this operation can be performed by means of the index known in the investment analysis as the account rate of return or the ARR coefficient of the efficiency of investments. It is recommended that this be applied to estimate the current (per each year) or annual average revenue of the project. These calculations are based on the relationship of the average yearly sum of returns from implementing the project for the period to the average annual sum of investments percent per year):

$$I_d = ARR = 1/n \left(\sum_{i=1}^{n} P_{ri} \middle/ \sum_{i=1}^{n} I_i \right)$$

$$= 1/n \left(\sum_{i=1}^{n} P_{avi} S_{pi} \middle/ \sum_{i=1}^{n} C_{ci} F_{ci} \right) \times 100,$$

where i is the index of the object implementation year, $i = (1, ..., n)$; n is duration of the project, years; P_{ri} is the profit for the ith year, rubles; I_i is the size of investments for the ith year, RUB; P_{avi} is the average value of development areas, RUB/m²; S_{pi} is the size of the profit from implementation, m²; C_{ci} is the average yearly cost of implementing 1 m², RUB; and F_{ci} is the volume of financed construction, m².

Based on the above, we have the following:

—The average market current annual revenue of investments in real estate (average market remunerativeness of investments in branches or the average market coefficient of the remunerability of the indus-

try) is an important and practical index in socioeconomic and town building planning and investment predictions of the development of the housing sphere.

—It can be calculated by the general formula (percent per year)

$$I_d = (P_{av} S_p / C_c F_c - 1) \times 100.$$

The practical approbation of this calculation based on the data from the Russian market has turned out to be associated with some information difficulties. It has been shown how, in both the numerator and the denominator, different variables can be used depending on the sources and character of their data.

1. When calculating the proceeds (numerator), the average specific price of the sale of areas is multiplied by the size of the sale. These data can be obtained from two sources.

The first one is the official data of the Russian Register on the number of registered agreements on participation in shared development (PSD) multiplied by the average square of a flat in the buildings under construction. However, based on different estimations, the share of the registered agreements makes up less than 80−90% of the total number of agreements in Moscow and 50−95% in regions. At the same time, some portion of sales is made by other legal grounds of the Housing Construction Cooperative (HCC), etc. Thus, the regional corrector factor C_r should be added to the numerator, the values of which differ across the regions and are changing over time depending on the higher or lower control from the government over the activity of developers.

The second source consists of data of the analytical companies on the volume of absorption of the areas based on the market, which keeps its own registry of houses under construction. With qualitative monitoring and analysis of the market, these data are more reliable and have no need to introduce the correction factor.

2. In calculation of expenditures (denominator in the formula), the required data are the cost of building 1 m² of housing and the volume of building per period of investigation. These data can also be obtained from various sources, i.e., for the first index, from the official data of Rosstat or from the data of project declarations (PD) and, for the second index, from the market data of analytical companies (in official data, this index is absent).

Furthermore, the need to use the correction factor as the ratio of additional costs C_{ac}, the values of which may differ according to the source (Rosstat or PD) of the data due to different sets of cost elements used in these calculations persists. According to the above said, the objective of this work is to increase the reliability of methods for determining the average market current return of investments in the development of residential real estate.

The aims of this study are as follows:

—a comparative analysis of the structure and set of expenditures on development that are present in the above mentioned differentiated sources;

—the determination of average market values of the correcting coefficients.

VARIANTS OF METHODS DEPENDING ON THE SOURCE OF THE BENCHMARK DATA

The formula for calculating the index of average market current annual revenue of investments in the development according to sources and character of the initial data is made in one of four ways as follows:

$$I_d = (P_{av}S_{aa}Q_c\,\mathrm{K_p}/C_{c1}S_c\mathrm{C_{ac1}} - 1)\times100\%, \qquad (1)$$

$$I_d = (P_{av}S_{aa}Q_c\,\mathrm{K_p}/C_{c2}S_c\mathrm{C_{ac2}} - 1)\times100\%, \qquad (2)$$

$$I_d = (P_{av}\,S_p/C_{c1}S_c\mathrm{C_{ac1}})\times100\%, \qquad (3)$$

$$I_d = (P_{av}\,S_p/C_{c2}S_c\mathrm{C_{ac2}})\times100\%, \qquad (4)$$

where P_{av} is the average value of the specific selling price of the object, RUB/m^2; Q_c is the number of registered agreements of shared construction participation (SCP) according to the Rosregister data, pc.; S_{aa} is the average area of the apartment in a new building, m^2; K_p is the correction index of the volume of sales; C_{ac1} is the coefficient of additional costs when using the Rosstat data; S_p *is* the volume of mergence of squares by market data, m^2; C_{ac2} is the coefficient of additional expenditures in using the PD data; C_{c1} is the average cost of construction of 1 m^2 (by the Rosstat data), RUB; C_{c2} is average cost of construction of 1 m^2 (by PD data), RUB; and S_c is the annual volume of construction (by market data), m^2.

ANALYSIS OF THE COMPOSITION OF ELEMENTS OF COSTS CONSIDERED WHEN CALCULATING THE COST OF CONSTRUCTING 1 m^2 OF HOUSING

The items associated with determining the structure of total (investment) expenditures on development are considered in [5, 6]. They are divided into seven groups of the first level and further divided into another two levels (Table 1).

The first level (I) includes the preinvestment costs of developing the concept of an investment project and business plan; the cost of land, including the fee for connecting to the city's utility networks; the cost of design and construction; maintenance and return of borrowed funds; administrative (overhead) costs of the developer, including the cost of communicating with the officials during the approvals, examinations, inspections; the cost of implementation areas; the cost of information and consulting services in outsourcing.

The official sources, as well as in the practice of assessing the effectiveness of investment projects, the cost of residential real estate development includes only the cost price (estimated value) of construction, i.e., components It. 3 and, partially, It. 5.

Thus, according to the Rosstat [7] technique, when calculating the average cost of constructing 1 m^2 of housing, the costs include those of new construction and broadening, as well as reconstruction and modernization of the objects, i.e., expenditures on constructing buildings and structures, which consist of fulfilled construction works and other concomitant capital costs (design and survey works, works on allocating land for construction, etc.), included into the inventory list when the object is put into operation, and of the costs of communication within the building required for its operation (the entire heating system and sewage inside the building, internal gas network, power and lighting wiring, telephone wiring, the ventilation for general sanitary purposes, lifts and elevators, etc.). The cost of research does not include expenditures on acquiring ownership of lands and nature objects, expenditures on research, and developmental and technological works, which are investments in other nonfinancial assets.

Thus, Rosstat data on the costs of housing construction reflect that part of dweller's expenditures, which is commonly called the *cost value of construction,* whereas when defining the returns on investment in real estate, it is necessary to use the index of the total (investment) cost of construction. In connection with this, it is necessary to use the index of total (investment cost of construction. In doing this, it is necessary to analyze the share structure of the elements of total costs of development accepted for accounting in various sources.

One of the earliest research works devoted to analyzing the real structure of the investment cost of construction was fulfilled in 2007 [8] (Table 2).

According to this study, the proportion of civil and erection works (CAW) accounted for 62% of the total construction cost, the share of land costs was 14−15%, the share in the engineering infrastructure was 9%, and the share of finance was 7%.

In recent years, the share of CAW construction activities costs decreased to 30−40%; the share of land costs has increased sharply due to the rising cost of land and utilities. According to various estimates, in Moscow, it currently reaches 40−50%, while in the regions, it is 20−30%. Other encumbrances, such as resettlement and compensation for demolition, the construction of social facilities, taxes, and liability insurance for the builder, are 10−20% [9].

Table 3 shows an assessment of accounting for the items of the total (investment) costs from various sources obtained by the results of our study of corporate standards for calculating the cost of construction in preparing the project declarations, interviews with leaders, and experts of large real estate companies.

Table 1. Structure of the total expenditures on development

Level of expenditures structure	Number of the expenditure item	Content of expenditure item
A	1	2
0	0	Total (investment) cost of the developer project
I	1	Preinvestment expenditures on the development of the concept and business plan of the investment project
II	1.1	Expenditures on the formation of the investment idea of the project
III	1.1.1	Definition of the investment attractiveness of the region, resource possibilities of the land plot
III	1.1.2	Definition of the variants of the functional purpose, morphotype, the class of the real estate object quality
III	1.1.3	Analysis of the market, implementation of marketing studies
III	1.1.4	Conceptual designing and calculation of the economic efficiency of the project
III	1.1.5	Preparation of the marketing concept, business-concept and business-plan of the project
II	1.2	Expenditures on the organization of financing and implementation of project (investigation of investment possibilities)
III	1.2.1	Determination of the ratio of debt and equity
III	1.2.2	Search for and conclusion of agreements with Investors, Designers and Contractors
III	1.2.3	Preparation of the Investment and Information memorandum
II	1.3	Feasibility study (preliminary)
III	1.3.1	Development of the technical indices of the project
III	1.3.2	Preparation of economic indices of the project (based on technical data)
III	1.3.3	Formation of the financial model of the investment project
I	2.	Expenditures on land
II	2.1	Expenditures required for the acquisition of land ownership in the primary (auctions) and secondary markets
III	2.1.1	Cost of the land plot
III	2.1.2	Land property tax for the period of construction
II	2.2	Expenditures on acquisition of land for rent in the auction method of gaining access to land
III	2.2.1	Cost of lease rights for the construction period
III	2.2.2	Rent for the period of design and construction
III	2.2.3	Cost required for the acquisition of land for rent at the auction method of gaining access to land
II	2.3.	Cost of land allocation under the investment contract with the city
III	2.3.1	Lease payment for the period of design and construction
III	2.3.2	Cost of royalties to the City Administration for access to the land under the investment contract
II	2.4	Costs not depending on the method of access to land
III	2.4.1	Costs associated with the allocation of land and its registration
III	2.4.2	Expenses for compensation of losses to previous users of land because of exemption of land for construction and the resettlement of former occupants of demolished dwellings
III	2.4.3	Cost of construction and installation work on the development of the construction site
III	2.4.4	Costs of work associated with unfavorable hydrogeological conditions

Table 1. (Contd.)

Level of expenditures structure	Number of the expenditure item	Content of expenditure item
A	1	2
III	2.4.5	Fee for connection to city networks
I	3.	Cost of design and construction
II	3.1.	Expenditures on design and survey works
III	3.1.1	Cost of design and survey works
III	3.1.2	Expenditures on coordination and obtaining the set of permitting documents
II	3.2	Cost of construction
III	3.2.1	Building installation works
III	3.2.2	Limited costs
III	3.2.3	Estimated earnings of the Contractor
II	3.3	Cost of engineering infrastructure
II	3.4	Costs of resource maintenance and warehousing resources
II	3.5	Other costs
III	3.5.1	Costs of maintenance of customer-builder service
III	3.5.2	Costs of technical supervision
III	3.5.3	Costs of acceptance and commissioning
I	4.	Maintenance and return of borrowed funds
II	4.1	Short-term liabilities
III	4.1.1	Development of procedures for interaction with Lenders
III	4.1.2	Payment of interest on loans and of the principal amount of the loan
III	4.1.3	Payment of interest on loans (if the loan is with interest) and principal sum of loan
II	4.2	Long-term duties
III	4.2.1	Development of procedures for interaction with Lenders
III	4.2.2	Payment of interest on loans and the principal amount of the loan
III	4.2.3	Payment of interest on loans (if the loan is with interest) and of the principal amount of the loan
II	4.3	Costs of IPO and other ways of attracting investment
II	4.4	Return of Investments to participants in construction to PSD
I	5.	Management (overhead) of the developer's expenses
II	5.1	Salaries of administrative personnel
II	5.2	Office expenses
II	5.3	Cost of communication with officials in approvals, examinations, inspections
I	6.	Costs of plots
II	6.1	Costs of real estate services
II	6.2.	Costs of the organization of own sale offices, of advertising and other ways of sales promotion
I	7.	Cost of information and consulting services in outsourcing
II	7.1	Auditing services
II	7.2	Marketing services
II	7.3	Legal services

Table 2. Structure of investment cost of 1 m^2 of the area of construction on the plot acquired at public auctions in 2007

Cost component	Costs, RUB/m^2	Share of expenditures in the total cost of construction, %
Acquisition of rights to development, resettlement	6154	14
Formation of the land plot	525	1
Designing	997	2
Prime cost of sales (construction and installation work)	27874	62
Administration	472	1
Engineering infrastructure, including payment for technological connection to networks	3984	9
Overhead developer expenditures	1939	4
Interest on loans	3257	7
Inventory cost of construction before tax	45203	100

Source: Data on 40 objects of LLC Zheldoripoteka (www.zdi.ru).

Table 3. Extent to which total (investment) costs are included in various sources

Content of costs	Inclusion of elements in various sources		Share of costs, %	
	Rosstat	Project declarations	Moscow	Regions
Preinvestment costs of development of the concept and business-plan of the investment project	−	−	2−3	1−3
Cost of land	−	+	25−35	20−30
Cost of designing and construction	+	+	30−40	50−60
Maintenance and return of borrowed funds	−	−	5−30	3−15
Management (overhead) expenses of the developer	+/−*	+/−*	10−15	10−15
Costs of space realization	−	−	3−5	3−4
The cost of information and consulting services in out-sourcing	−	−	1−2	1−2
Total share of included costs, %	40−50	75−85	100	100

* Partially.

The obtained data allow us to estimate the coefficient of additional costs in using the data from Rosstat or PD; included components (by Rosstat) are 65% on average and 80% by PD, which corresponds to $C_{ac1} = 1.55$ and $C_{ac2} = 1.25$.

CALCULATION OF THE CURRENT ANNUAL RETURN ON INVESTMENTS IN REAL ESTATE DEVELOPMENT

Methods of assessing the current annual return on investment in real estate development of residential-estate approved based on data for Moscow for 2010–2014 (Table 4).

The results of calculations based on different versions (see Formulas (1)−(4) less and taking into account correcting coefficients are given in Table 5.

Figure 1 provides summary results of the study as dynamics of the volumes of revenues and costs, as well as of the return of investments in housing buildings in Moscow in 2010−2014 (taking into account the summary of the correcting coefficients). The returns are calculated without taking into consideration the coefficients.

RESULTS OF THE STUDY AND THE STATE OF THE HOUSING MARKET IN 2010−2014

The results of the study show that, when using the correcting coefficients, the average values of the index of current annual revenue are 1.3−1.4 times lower (Fig. 2). In this range of values relative to the average, caused by information noise (random errors in the input data), is also reduced and does not exceed the absolute value of 5−6%.

Table 4. Initial data for evaluating return on investment in real estate development

Index	2010	2011	2012	2013*	2014 *
Average unit sale price in December P_{av}, thousand RUB/m²**	168.5	185.5	230.7	166.7	216.0
Number of registered contracts of participation in shared development (PSD)***	1.2	4.6	12.1	21.3	27.2
Average area of apartments in new buildings S_{aa}, square meters**	76.0	73.0	72.0	68.0	69.0
Volume of area absorption, according to market data S_p, thousand square meters**	96.5	532.4	764.4	1217.0	1616.0
Volume of construction S_c, million square meters**	2.31	2.18	2.14	4.20	4.3
Input volume, million square meters****	1.97	2.11	2.15	3.10	3.32
Average cost of 1 m² according to Rosstat C_{C1}, thousand rubles****	38.7	57.3	45.3	41.9	41.7
Average cost of 1 m² according to PD C_{C2}, thousand rubles	52.3	73.5	59.5	54.7	54.2

* In view of the joined territories.
** Base of data of proposals for sale and design of declarations of Sterniks Consulting.
*** Rosreestra Department for Moscow.
**** Rosstat.

Table 5. Results of calculating the average market current annual return of investments in development of the residential real estate of Moscow, %*

Formula	Less correcting coefficients					With correcting coefficients				
	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014
(1)	−82.8	−50.1	107.2	48.8	108.4	−87.8	−64.7	45.6	17.0	47.9
(2)	−87.3	−61.1	57.8	26.3	60.4	−88.8	−65.8	38.9	11.6	41.1
(3)	−86.4	−20.9	81.9	49.0	103.4	−92.4	−49.0	18.5	−3.9	44.4
(4)	−93.5	−38.4	38.5	14.2	56.5	−95.2	−50.7	10.8	−8.8	37.7

Thus, in an estimate of the average market current annual return of investments in development of residential real estate, it is reasonable to carry out calculations with all four versions of the formula or with version (3) as the closest to the average values. The obtained results of a study of the dynamics of indices of the residential real estate in Moscow in the considered period agree with the data on the condition and development of the residential market [9—12].

In 2010, the construction of almost half of the houses was not finished. New construction was almost absent. Only objects with high degrees of completion were being finished. The volume of continued construction (2.31 million square meters) had only negligibly surpassed the volume of introduction (1.97 million square meters). Summary costs for developers were 151—185 billion rubles. However, in these objects, there were actually no sales — all of the buildings had been sold earlier. The number of registered PSD was no more than 1200, the volume of absorption area was 96500 m². The summary earnings of developers were 16—17 billion rubles.

The construction was financed by major developers who had concentrated their own means on the starting objects; by this same source, which had received unfinished objects by investment contracts with government authorities under the program for supporting deceived investors in exchange for new land plots; and by credit institutions that had inherited unfinished objects and had created their own developer structures.

As a result, the developers hardly got a return on the investment. As a result, the developers hardly got a return on investments, as the current yield of projects was 92.5% on average.

In 2011, the situation began to improve. The volume of the introduction had slightly increased, but that of construction decreased; previously unfinished objects were introduced, but some new objects began to be put on the market. This process slowed down somewhat due to changes in the city authorities and the beginning revision of previously concluded investment contracts, as well as a one-year moratorium on the issuance of permits under the conditions of short-
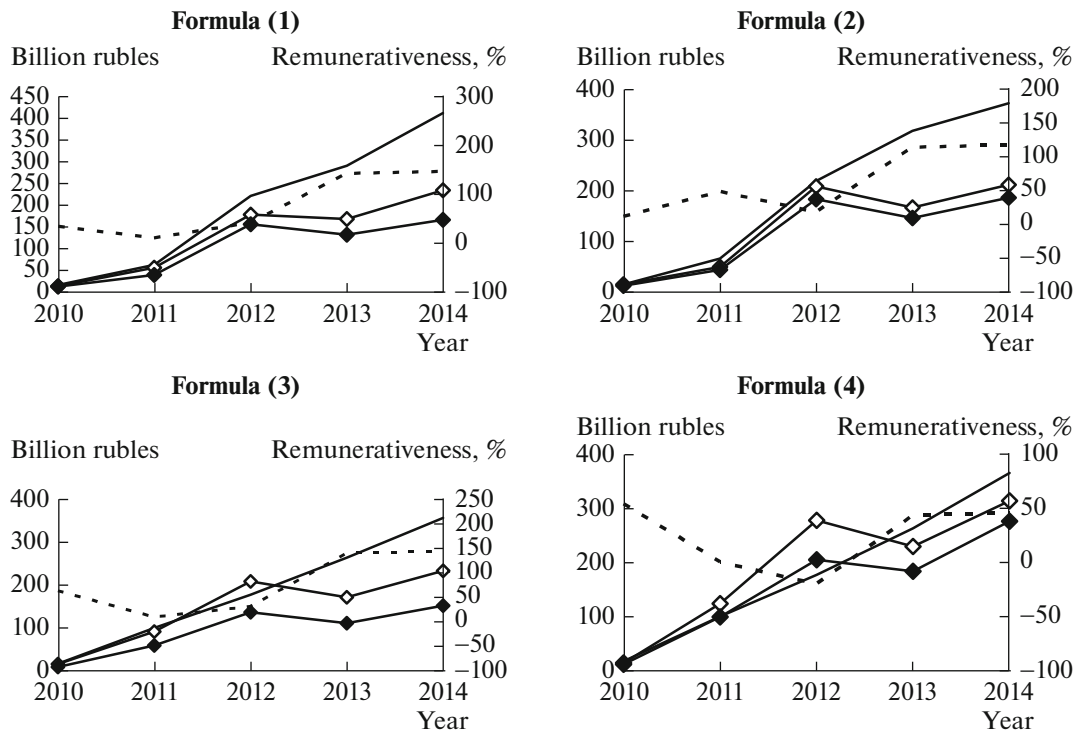
Formula (1)

Formula (2)

Formula (3)

Formula (4)

Fig. 1. Results of estimating the index of running annual return of investments in developing residential real estate in Moscow by various sources of initial data: —— proceeds; ---- costs; —◇— return less correcting coefficients; —◆— total remunerativeness.

age of sites for housing. Total costs decreased to 124–200 billion rubles. The number of registered PSD increased to 4600 (four times), the amount of space absorption increased five times, the offer price increased by 10%, and the revenue increased by five times and amounted to 62–99 billion rubles. A partial return on investments began, and the average current yield of development increased to 57.6%.

In 2012, the market for the construction and sale of residential real estate was ultimately restored. Summary costs were 149–159 billion rubles. The number of registered PSD increased up to 12100, the volume of

Fig. 2. Comparative dynamics of the index of running annual remunerativeness of investments in development by four variants of calculation (formulas): —◆— (1); —□— (2); —◇— (3); —●— (4); —▲— average.

absorption of sites increased to 764400 m², prices increased by 15%, and returns increased to 176–221 billion rubles. Finally, the current annual returns of development became positive and reached 28.5%.

The year 2013 was noted by two important events. First, the stage of post-crisis restoration of the RF economy was finished, it turned to the stage of stagnation, as a result of which the rate of income for single-family homes had decreased. Second, by the end of 2012, the annexation to Moscow of new territories with considerable potential of land plots for construction was completed but they differed substantially by a lower level of house prices. The volume of construction in Moscow relative to the former borders of Moscow almost doubled, while the amount of input increased one and a half times. The total costs amounted to 273–287 billion rubles. The number of registered PSDs reached 19800 and the amount of space absorption was 1217000 m². The prices (average for Great Moscow) declined slightly. With a sharp increase in the costs, the amount of revenue increased less significantly (up to 262–319 billion rubles) and the current annual yield of development has dropped to 4%.

In 2014, by virtue of certain macroeconomic and political shocks, which caused excessive demand on the real estate market, there has been some increase in the volume of construction and housing construction. Total expenses increased slightly (up to 278–291 bil-
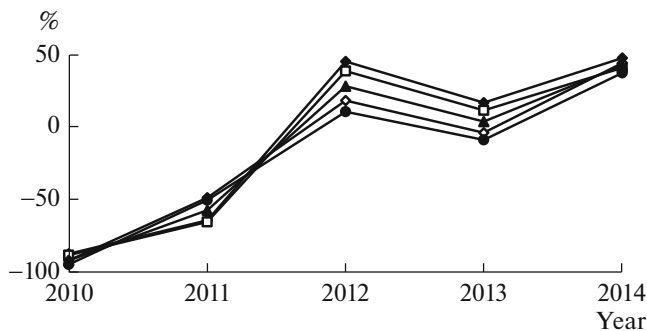
lion rubles). However, while the number of registered PSD increased (by 27 200, or by 21%) and the amount of absorbed space (up to 1 616 000 m² or by 33%), as well as the average price of housing, have increased significantly. The revenue increased to 355–411 billion rubles, the actual annual return on investments in real estate development of residential real estate increased to 42.8%.

Thus, the obtained results are supported by the data on the condition and development of the construction market and on sales of residential real estate in 2010–2014 and can be recognized as correct.

CONCLUSIONS

1. The actual mid-market annual return on investment in the development of residential real estate (average market rate of return in the industry or the market average rate of profitability of the industry) is an important and popular indicator for the socio-economic and urban planning and investment forecasting of the development of the housing sector. The methodical development of feasibility study of this index is an actual scientific and practical task.

2. As a result of the conducted study, variants of the method for estimating mid market running annual return on investments in the development of residential real estate depending on the character and content of the initial data on costs in the used sources (prime cost of construction or total investment costs) have been developed.

Based on an analysis of the set of costs of development used in various sources, the obtained coefficients allow us to shift from estimating the running annual return on investment in relation to the cost of construction to estimating this return in relation to the total investment cost. The method has been tested on the data for Moscow and the possibility of using it to manage investments in the housing market has been justified.

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