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Modelling the efficiency of development projects considering the acquisition of land rights through the purchase of a legal entity

This paper presents an analysis of developers' approaches to the acquisition of land plots for project implementation, the form, common in modern conditions when a developer acquires 100 % of the shares of a legal entity that has lease rights to a land plot intended for development, is investigated. The multifactoriality of the investment efficiency assessment task is noted, based on financial modelling that takes into account the specifics of the considered project entry option according to the criterion of return on investment. A decision-making procedure in the analysis process is constructed, consisting of eight stages and including calculations of economic, technical, urban planning, social, and other project parameters. Calculations were performed according to the proposed algorithm using a real development project as an example, utilizing current regulatory and analytical information, which confirms the feasibility and advisability of entering the project through the purchase of shares in a legal entity. The formulated requirements for constructing a financial model of the project, taking into account the considered form of land acquisition, have practical significance, including: determining the volume of investments in the project considering project financing, forming the project's profitability indicator based on comparing dividend flows from the project and the cost of acquiring shares in the legal entity, as well as taxation for both the project itself and the developer when receiving dividends.

Keywords: *development project, investments, efficiency assessment, dividends, profitability, acquisition of a legal entity, land plot*

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INTRODUCTION

Increasing investment activity in Russia requires the development of methods for assessing and modelling the efficiency indicators of capital investments, taking into account numerous parameters that determine the general economic, financial, urban planning, technical, technological, social, and other conditions for project implementation, the number of which can reach 30–50 values[1] [1, 2]. Their composition and range vary over the project's life cycle, which can create significant risks [3]. At the same time, investors, developers, and other project participants are interested in indicators of maximum return on their investments, obtained by modelling the optimal combination of project parameters and its environment, subject to compliance with the requirements of federal and regional regulatory legal acts. In this context, the form of acquiring the land plot for construction becomes a significant factor, including whether it is free, built-up, or through the acquisition of a legal entity that has lease rights to the land plot. Each option has its own characteristics that should be taken into account in the investment efficiency assessment model.

To obtain a reliable result of project evaluation, it is necessary to choose a justified range of parameter value changes and the correct decision-making order within the framework of modelling the project's financial results [4–6].

The decision to enter a new project is primarily based on modelling the level of return on investment, which should not be lower than the return on the developer's current portfolio or alternative investment options [7].

METHODS

To form indicators characterizing the efficiency of investments in a development project, this study uses financial modelling, which allows for a multivariate assessment depending on the choice of parameters both at the early stage of project justification and for monitoring its profitability during implementation and closure [8–10]. Also, when using this method, it is possible to take into account all modelling parameters and obtain quantitatively measurable results, in particular, to form cash flows of the project's net profit, which for the developer will be dividends from participation in the project.

As already noted, not only the set of parameters taken into account is important, but also the order of performing calculations and making intermediate and final decisions in the modelling process. In modern conditions of implementing development projects, eight main stages of evaluating their effectiveness have been identified:

1) assessment of the land plot potential, consisting in determining the sellable area of the project;
2) determination of the social load on the project — construction of kindergartens, schools, clinics;
3) determination of the project concept — what class of housing will be implemented on the land plot;
4) based on the concept, determination of the object's height, design and construction costs, and the sale price of residential and commercial premises;

1 Methodological recommendations for assessing the effectiveness of investment projects (Second edition, revised and supplemented) (approved by the Ministry of Economy of the Russian Federation, Ministry of Finance of the Russian Federation and Gosstroy of the Russian Federation on June 21, 1999 No. VK 477).

Table 1. Determination of the project's sellable area

Project Area	SPP in GNS	Sellable Area
Residential part, sq. m	119,000	77,350
Commercial (public and business part, street retail), sq. m	4,000	2,800
Parking, units	–	530
Total (excluding parking), sq. m	123,000	80,150

5) distribution of the project's cash flows, taking into account the pace of construction and sales dynamics;
6) determination of the project's financial result, taking into account the costs of project financing (interest on the project loan), sales promotion costs, and project management costs;
7) determination of return on investment through receiving net profit and dividend payments;
8) calculation of return on investment and comparison with the developer's target rate of return.

The parameters and procedure for assessing investment efficiency proposed in the study are considered using the example of a project where the developer acquires 100 % of the shares of a legal entity that has lease rights to a land plot intended for development. The developer then carries out the design, construction, and sale of a residential object, resulting in profit. To implement the project, the developer attracts project financing in accordance with modern housing construction regulations. Thus, the investment is the payment for acquiring the legal entity, and the return on investment for the developer occurs after receiving net profit from the project in the form of dividends.

At the first stage, an assessment of the land plot potential is carried out based on the GPZU[2]. For the implementation of the studied project, a land plot located in the South-Western Administrative District of Moscow, with an area of 2.5 hectares, was considered. The assessment of the land plot parameters gave the following indicators: the total floor area of the project within the outer walls (SPP GNS) is 123,000 sq. m, of which the residential part is 119,000 sq. m, commercial 4,000 sq. m, the number of parking spaces in the underground parking is 530 units. The maximum height of the object is 100 meters. The useful sellable area is determined by converting SPP GNS with a coefficient of 0.65 for housing and 0.7 for commercial areas and is presented in Table 1.

To implement the project, it is necessary to change the permitted use of the land plot (VRI) from the current (industrial purpose) to residential construction. The amount of payment for changing the VRI[3], taking into account the installment plan under the contract for 6 years with an actual construction period of 13 quarters, amounted to 6,977,048.1 thousand rubles (Table 2). The amount of rent for the land plot, calculated based on the new cadastral value of the land plot, will be 112,993 thousand rubles.

At the second stage of the assessment, the calculation of the project's social load is performed based on the estimated number of residents in the new residential complex, depending on

Table 2. Calculation of the fee for changing the permitted use of the land plot

Cadastral number of the land plot	NNN
Right	lease
Land plot area, sq. m	25,001
Total floor area of the residential part of the capital construction object, sq. m	123,000.0
Current cadastral value of the land plot, rubles	1,148,160,424.58
Cadastral value of the land plot after changing the VRI (593-PP/273-PP), rubles	1,590,697,625.36
Average specific indicator of cadastral value (UPKS) of the land plot for VRI after change, rubles/sq. m	63,625.36
Base cost indicator (residential purpose), rubles/sq. m	203,910.98
Coefficient for calculating the fee for changing the VRI of the land plot, %	298.3 %

2 Urban Planning Code of the Russian Federation (GrK RF) of December 29, 2004 No. 190-FZ (latest edition).

3 Moscow Government Decree 593-PP dated September 10, 2013 "Approval of the Procedure for determining the fee for changing the type of permitted use of a land plot owned by an individual or legal entity to another type of such use, providing for the construction and (or) reconstruction of a capital construction object, and the List of types of capital construction objects of important socio-economic significance for the city of Moscow, during the construction and (or) reconstruction of which the fee for the use of the type of permitted use of the land plot is not charged" (as amended on April 10, 2024).

Cadastral number of the land plot	NNN				
Price change coefficient (set by the Moscow City Property Department)	1.5573				
Profitability / location coefficient	1.000				
Rent coefficient	0.1216				
Fee for changing VRI, rubles	4,744,732,876.92				
Installment period, quarters	24				
Quarterly payment, rubles	197,697,203.21				
Installment rate, %	19.00				
Total fee for changing VRI, including installments for the entire construction period	6,977,048,132.50				
Quarter number	Date	Payment	Rent for the 1st year	Balance + 19 % rate	Payment for the entire period, rubles
1	Nov. 24	197,697,203.21	994,186.02	226,508,183.71	425,199,572.93
2	Feb. 25	197,697,203.21	994,186.02	217,070,342.72	415,761,731.94
3	May 25	197,697,203.21	994,186.02	207,632,501.74	406,323,890.96
4	Aug. 25	197,697,203.21	994,186.02	198,194,660.75	396,886,049.97
5	Nov. 25	197,697,203.21	994,186.02	188,756,819.76	387,448,208.98
6	Feb. 26	197,697,203.21	994,186.02	179,318,978.77	378,010,367.99
7	May 26	197,697,203.21	994,186.02	169,881,137.78	368,572,527.00
8	Aug. 26	197,697,203.21	994,186.02	160,443,296.80	359,134,686.02
9	Nov. 26	197,697,203.21	994,186.02	151,005,455.81	349,696,845.03
10	Feb. 27	197,697,203.21	994,186.02	141,567,614.82	340,259,004.04
11	May 27	197,697,203.21	994,186.02	132,129,773.83	330,821,163.05
12	Aug. 27	197,697,203.21	994,186.02	122,691,932.84	321,383,322.06
13	Nov. 27	2,372,366,438.46	11,930,232.19	113,254,091.86	2,497,550,762.51
–	–	–	23,860,464.38	2,208,454,791.19	6,977,048,132.50

the number of places and visits per shift in social facilities[4, 5] [11] and the standard cost of construction of a social facility approved by the Moscow City Government. In the project under consideration, the average estimated number of residents was 2,380 people, determined as the ratio of SPP GNS of the residential part to the provision standard of sq. m for Moscow, which is 50 sq. m SPP GNS per 1 resident (119,000 sq. m/50 sq. m)[6]. Since the estimated number of places and visits per shift for social facilities for the project under consideration is insufficient for the construction of separate social infrastructure facilities, the project budget includes compensation in cash for the need for social facilities in the Moscow city budget, as shown in Table 3.

At the third stage of the analysis, the housing category is determined. The location of the land plot suggests the construction of a business-class residential object. According to comparable objects, the following specific indicators of construction and sales costs correspond to this class:

- the cost of design and survey works and construction and installation works "turnkey" is 180,00, rubles per sq. m of sellable area;
- the average sale price of 1 sq. m of apartments is 490,00, rubles per sq. m.;
- the average sale price of 1 sq. m of commercial areas is 600,00, rubles per sq. m;
- the average sale price of 1 parking space is 3,300,00, rubles.

4 Appendix to the Moscow Government Decree of December 21, 2021 No. 2151-PP Urban Planning Standards of Moscow in the field of education.

5 Moscow Government Decree of December 21, 2021 No. 2150-PP "Approval of urban planning standards of Moscow in the field of healthcare".

6 Moscow Government Decree of December 21, 2021 No. 2152-PP "Approval of urban planning standards of Moscow in the field of trade, services and ensuring comfortable and favourable living conditions for citizens in residential facilities (as amended on October 20, 2023)".

Table 3. Calculation of the number of places in social facilities and the cost of compensation

Name of the social facilities provision standard	Standard	Unit	Estimated number of places/visits, units	Construction cost per 1 place/ visit, thousand rubles/unit	Amount of compensation for social facilities, thousand rubles
Standard (places/1,000 residents), Secondary school	105	places	250	2,858	714,578
Standard (places/1,000 residents), Preschool	46	places	110	4,198	461,815
Standard (visits/shift) mixed polyclinic	19	places	46	9,170	421,804
Total	–	–	–	–	1,598,197

The financial model provides for contingency reserves of 5 % of the design and construction costs, project management costs of 4 % of the total design and construction costs and contingency reserve, as well as marketing and advertising costs of 3 % of total sales.

RESULTS

At stages 5–8, based on the obtained initial data, financial flows are modeled and project results are determined (Table 4). Within the financial model, project financing parameters are taken into account.

Table 4. Financial model of the project

Item name	Unit	Total	Total per sq. m (excluding parking)
Area of land plots for residential development	ha	2.50	
Total floor area of development in GNS (excluding infrastructure objects)	sq. m	123,000	
Sellable area, including:	sq.m	83,719	
apartments	sq. m	77,350	
public and business part (street retail)	sq. m	2,800	
parking	units	530	
Sellable area (excluding parking)	sq. m	80,150	
Development height	m	100	
Acquisition	thousand rubles; rubles/sq. m	8,688,238	108,400
Fee for changing VRI (including % for installment)	–	6,977,048	87,050
Land plot rent		112,993	1,410
Compensation to Moscow city budget for social facilities		1,598,197	19,940
Design and construction of residential development objects	thousand rubles; rubles/sq. m	14,427,000	180,000
Contingency expenses, 5 %	thousand rubles; rubles/sq. m	721,350	9,000
Overhead costs, including:		3,569,304	44,533
project management, 4 %	thousand rubles; rubles/sq. m	605,934	7,560
marketing, 3 %		1,239,915	15,470
loan interest, including		1,723,455	21,503
bridge loan interest (5 % equity financing), decreasing rate 17–10 %		874,499	10,911
Project financing interest		848,956	10,592
Total Project costs	thousand rubles; rubles/sq. m	27,405,892	341,933
VAT	thousand rubles; rubles/sq. m	53,312	665
Revenue	thousand rubles; rubles/sq. m	41,330,500	515,664
apartments	thousand rubles; rubles/sq. m	37,901,500	490,000
public and business part (street retail)		1,680,000	600,000
underground parking		1,749,000	3,300,000
Income tax (25 %)	thousand rubles; rubles/sq. m	3,467,824	43,267
Profit before tax	thousand rubles; rubles/sq. m	13,871,296	173,067
Net profit	thousand rubles; rubles/sq. m	10,403,472	129,800
Return on sales based on profit before tax, %	–	–	33.6
Net profit margin, %	–	–	25.2

Table 5. Calculation of return on investment

Year	2024	2025	2026	2027	2028	Total
Investments, thousand rubles	–4,000,000	0	0	0	0	–4,000,000
Dividends, thousand rubles	0	0	0	5,201,736	5,201,736	10,403,472
Total	–4,000,000	0	0	5,201,736	5,201,736	6,403,472
Calculated internal rate of return on investment	32 %	–	–	–	–	–

When constructing cash flows, the requirement of most banks for 5 % equity participation in the project is taken into account. The cost of such financing is calculated at the commercial rate for a bridge loan, which decreases from 17 to 10 % due to the prospect of a decrease in the Central Bank of the Russian Federation's key rate. The average bridge loan rate for the entire loan term was 14.02 %.

Project financing interest is calculated based on the distribution of cash flows in the financial model, taking into account the coverage ratio of funds in escrow accounts to the amount of the drawn loan. The average project financing rate was 1.89 %. The project's net profit is received as dividends by the developer within 1.5 years after the facility is commissioned.

Thus, having a schedule of investments and dividend receipts, the return on investment indicator for the developer is calculated. The amount of investment in acquiring 100 % of the shares of the company owning the land plot under lease rights, according to the terms of the share purchase agreement, is 4,000,000,00, rubles.

Calculations showed that, subject to the acquisition of shares in 2024, a project construction period of 13 quarters, and receipt of dividends within 1.5 years after the facility is commissioned, a return on investment schedule is formed, as shown in Table 5.

The calculated internal rate of return on investment was 32 %. With a target rate of return on investment for the developer with a similar term of 25 %, this project is interesting for implementation.

CONCLUSIONS

1. Methods for assessing the effectiveness of investments in development have become significantly more complex, taking into account the development of economic regulators of investment and construction activities. As a result, the financial modelling process should include factors that characterize not only the project itself but also the form of acquiring the right to develop the land plot.
2. In conditions of a shortage of free, investment-attractive land plots, a common form of entering a project for a developer is acquiring shares of a legal entity that has lease rights to a land plot on which the project is subsequently implemented.
3. The financial modelling used to assess the effectiveness of a development project in the studied variant should take into account the following features:
   - from a theoretical and methodological standpoint, we should talk not about assessing the effectiveness of the project, but about assessing the effectiveness of investments in acquiring a legal entity;
   - it is the cost of acquiring the legal entity that should be considered as the volume of the developer's investment in the project, as the developer implements the project entirely through project financing, without paying for project work from their own funds;
   - when modelling financial flows directly related to the project, the cost of acquiring the legal entity should not be taken into account, as these costs do not form the project's cost, which significantly increases the tax burden on the project;
   - when assessing the effectiveness of investments, the cost of acquiring shares should be compared with the amount of net profit from the project, cleared of taxes and received by the developer through dividend payments;
   - the criterion for the project's effectiveness for the developer is the internal rate of return indicator, calculated based on cash flows formed from investments in acquiring shares of the legal entity and their return in the form of dividends as the project's net profit is received upon its implementation;
   - when using the method of entering the project through the purchase of shares of a legal entity, the calculation of investment efficiency should take into account the taxation procedure for both the project itself and the developer when receiving dividends.

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Моделирование эффективности девелоперских проектов с учетом приобретения прав на земельный участок через покупку юридического лица

Представлен анализ подходов девелоперов к приобретению земельных участков для реализации проектов, исследована распространенная в современных условиях форма, когда девелопер приобретает 100 % долей юридического лица, имеющего права аренды на земельный участок, предназначенный под застройку. Отмечена многофакторность задачи оценки эффективности инвестиций на основе финансового моделирования с учетом особенностей рассматриваемого варианта вхождения в проект по критерию доходности инвестиций. Построен порядок принятия решений в процессе анализа, состоящий из восьми этапов и включающий расчеты экономических, технических, градостроительных, социальных и других параметров проекта. По предложенному алгоритму выполнены расчеты на примере реального девелоперского проекта с использованием современной нормативной и аналитической информации, которые подтверждают возможность и целесообразность вхождения в проект через покупку долей юридического лица. Практическое значение имеют сформулированные требования к построению финансовой модели проекта с учетом рассматриваемой формы приобретения земельного участка, в том числе: определение объема инвестиций в проект с учетом проектного финансирования, формирование показателя доходности проекта на основе сопоставления потоков дивидендов от проекта и стоимости приобретения долей юридического лица, а также налогообложение как для самого проекта, так и для девелопера при получении дивидендов.

Ключевые слова: *девелоперский проект, инвестиции, оценка эффективности, дивиденды, рентабельность, приобретение юридического лица, земельный участок*

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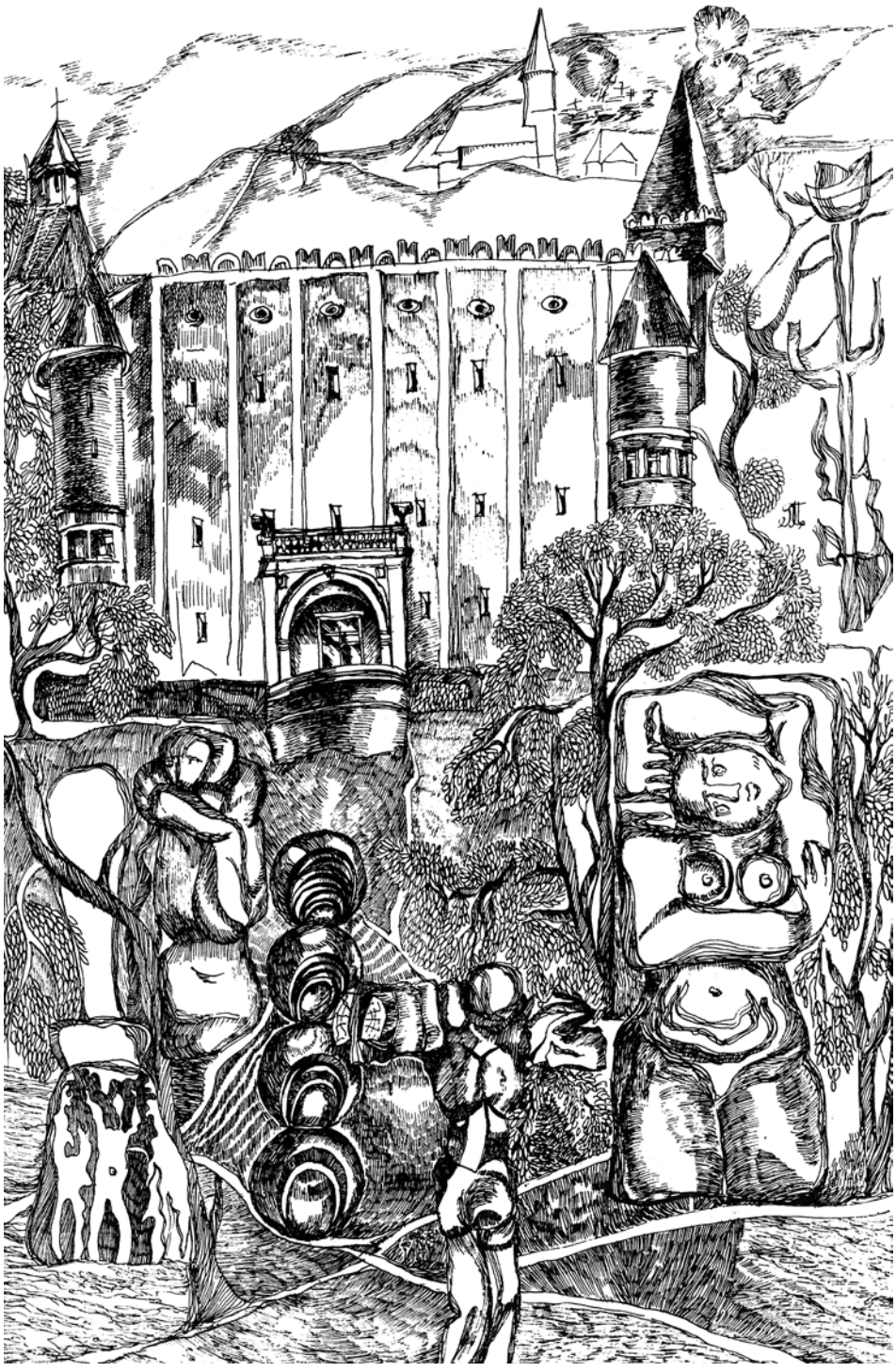

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