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# METHODOLOGICAL PRINCIPLES FOR THE VALUATION OF THE MORTGAGE REAL ESTATE

*Обґрунтовано, що однією з причин виникнення кризових явищ на ринку нерухомості є недостатня увага до якості аналітичної роботи. Проаналізовано стан іпотечного ринку в Україні. Визначено додаткові оціночні процедури, які необхідно застосовувати у процесі оцінювання заставного нерухомого майна. Розроблено методичні основи та практичні рекомендації щодо їх застосування.*

**Ключові слова:** іпотечний ринок, ринкова вартість, заставна вартість, ліквідаційна вартість, моніторинг ринку нерухомості.

## 1. Introduction

It is well known that the efficiency of the banking system is the key to the economic development of the country. In countries with developed economic relations, a significant part of investment in real estate is carried out through mortgage lending. Actually, the mortgage market provides the process of accumulating investment resources necessary for the development and construction of real estate, the activation of the financial and commodity markets. Despite some improvement in macroeconomic indicators in 2017, the risk of Ukraine's banking system remains one of the highest in the world, causing limited access of the domestic banking system to the capital market. In particular, the level of credit losses and troubled mortgage loans remains extremely high.

The activation of the mortgage market is directly related to the development of theoretical and methodological bases for valuating mortgage real estate, and has conditioned the research topic.

## 2. The object of research and its technological audit

*The object of research* is the valuation process of mortgage real estate. The size of a mortgage loan directly depends on the value of real estate objects transferred in pledge determined in the valuation process. The cost of mortgage is incorrectly determined due to the fact that in case of insolvency of the borrower banks are not able to return the loan funds in full. Accordingly, there is a need for the development of theoretical and methodological foundations and applied aspects of valuating mortgage real estate.

## 3. The aim and objectives of research

*The aim of this work* is studying the theoretical and methodological foundations and develop practical recommendations for the evaluation of real estate objects transferred as mortgage.

For the aim of research, the following tasks must be solved:

1. To determine the basis for valuating mortgage real estate.
2. To identify and justify the need to apply additional evaluation procedures in the valuation process of mortgage real estate.

## 4. Research of existing solutions of the problem

In [1, 2] it is proved that the cause of the global financial crisis, first of all, arose in the financing sector for the construction of real estate, there is a distorted view of the value of these facilities. The genesis of value theories is studied in [3–9]. A significant merit is the creation, on the basis of regularities, of the formation of demand and position in parallel with the theory of the value of the detailed theory of price [3]. The authors [4–9] came to the conclusion that cost is an economic indicator with the help of which in the long term the integral effect of the influence of managerial decisions taken by business entities is estimated. Theoretical and practical issues of property valuation in the implementation of credit transactions in the real estate market are regulated in [10–14]. However, a number of questions in the valuation of real estate objects remain unsolved or in need of improvement, in particular, theoretical and methodical provisions for valuating mortgage real estate in an imperfect market, characterized by information opacity.

## 5. Methods of research

The basis of the research is a systematic approach to the issue of valuing mortgage real estate. The methodological basis of this work is a set of methods of scientific knowledge of the problem, general scientific principles, methods and tools that are used in the research process. The information base of the research is the materials of the governmental portal, periodicals, the results of scientific research of scientists. The legal field of the valuation consists of international and European standards of valuation, the current legislative and regulatory acts of Ukraine. The solution of the tasks set in the work is carried out using the method of factor analysis, synthesis, systematization and generalizations, the method of cause-effect relationships, system analysis and a graphical method for visualizing the results of research.

## 6. Research results

The rate of interest on loans in modern society regulates the relationship between consumption, savings and

investment. The main cause of the global financial crisis is the credit expansion of banks, during which banks artificially lowered the interest rate on loans. At the same time, the current value of capital goods sharply increased, since the net cash flow that is produced by these goods is discounted at a lower market rate.

The consequences of falling interest rates on short-term and long-term loans are [1]:

- growth of current market value of bonds;
- increase in the speed of money circulation;
- growth of stock prices;
- a sharp increase in property prices;
- development of the industrial boom;
- rising prices for natural resources and for intermediate products;
- the explosive growth of exchange rates, caused by the expectation of a continuous increase in entrepreneurial incomes.

Artificial understating of the interest rate on loans leads to the formation of an illusion of value, which significantly exceeds the real market value of capital goods. The volume of world financial assets exceeds the volume of world GDP several times, financial capital as a result of financial speculation turned into a fiction that entailed a deep financial and economic crisis. However, the most destructive force and the main reason for the recession is the collapse in prices for real estate, which is preceded by a period of speculative boom.

At the same time, the issues of developing methodological and applied bases for real estate valuation were updated, the results of which serve as an information base for monitoring the impact of management decisions on the current and projected market value of immovable properties.

The theory of estimation has long been based on neoclassical economic theory, according to which market value is a function of supply and demand on the horizon of long-term equilibrium [3]. However, property prices correspond to their value only in a highly efficient market [4, 5]. The Ukrainian real estate market is not highly efficient: supply and demand is not in balance, potential users may be misunderstood (insufficiently) informed, and the activities of producers may be ineffective. These and other factors lead to the fact that property prices do not coincide with

its value, and the value indicators calculated with the help of different approaches have different numerical values.

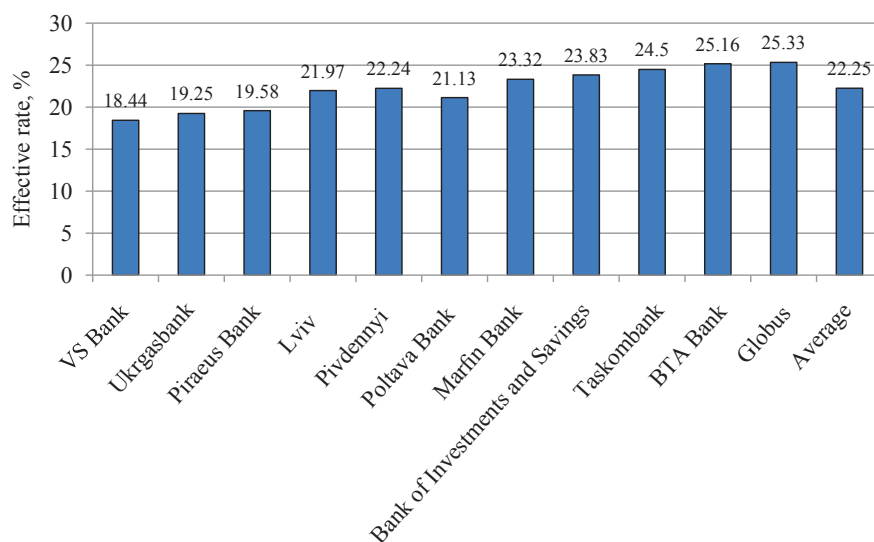
Representatives of the modern valuation school are critical of the neoclassical principles of the traditional methodology for determining the value of real estate. The essence of the position [6] is that the market price is a definite market phenomenon, and, unlike the value, does not have a moral context or the context of a fair price for the labor expended. As noted in [7, 8], valuation is a prediction of human behavior under uncertainty and should help the customer make a decision.

Taking into account the foregoing, let's agree with the opinion [9] that «...in relation to any single real estate object, at a certain point in time, different prices are possible – due to different circumstances of sale, differences in the preferences of buyers, different sets of information that have buyers or other factors...».

Separately, let's note that another reason for the emergence of crisis phenomena in the real estate market is insufficient attention to the quality of analytical work. In practice, in the process of determining the value of real estate, market monitoring, in most cases, is purely formal and not organized as part of the evaluation report, logically linked to other sections and the report as a whole. The cost is calculated by one or several standard methodical approaches: cost, income, comparative. Due to the harmonization of evaluation results determined by different approaches, only one digital value of value is obtained, on the basis of which it is necessary to draw conclusions about the value of the valuation object in the market, its investment attractiveness, and the effectiveness of its management system.

In addition, let's note that the results of valuating the mortgage real estate, of which the integral monitoring of the market for such facilities is part, will allow banks to make a more balanced decision regarding the size of the mortgage loan and assess all the risks associated with the property being valued.

For high risks, the effective interest rate on mortgage loans in Ukraine remains extremely high. Fig. 1 shows the effective rates of Ukrainian banks on mortgage loans for 5 years for the purchase of residential property in the secondary market.



**Fig. 1.** The size of effective rates of Ukrainian banks on mortgage loans for 5 years for the purchase of residential property in the secondary market [10]

As shown in Fig. 1, the average effective rate for these mortgages is 22 %.

The key question of the methodology for valuation of real estate is determination of the type of value that is determined for the purpose of lending. Let's note that at the international level, market value is recognized as the most adequate basis for valuating mortgage real estate [11].

International Valuation Standards are recommended when valuating mortgage real estate to determine market value, and the lender must himself conduct a sensible banking policy regarding the fate of the loan in the value of real estate. At the same time, it is not excluded that, depending on the circumstances and creditor's requirements, the appraiser may determine other types of value, in particular, the cost of compulsory selling, the cost of alternative use, or the future value of the mortgage. In accordance with International Valuation Standards, mortgage value is a method of calculating long-term risks [11].

However, according to credit institutions, in the process of valuing real estate for the purpose of obtaining a mortgage loan, the mortgage value must be determined. In particular, the amount of the loan that Kredobank gives is 85 % of the «mortgage» value for residential real estate and 75 % for non-residential, Pivdennyi Bank – 70 % [10].

Based on practical experience, it can be noted that each Ukrainian bank develops its requirements for valuating mortgage. The main methodical approach that was used in the pre-crisis period in valuating real estate in the mortgage lending system was a comparative approach based on retrospective information. This approach is based on the assumption that it is possible to extrapolate the value of transactions entered into in the real estate market in the recent past by the value of future transactions. However, in the valuation process of the mortgage real estate, it is necessary to take into account the possibility of its future enforcement implementation. At the same time, the cost of selling mortgage should not be less than all costs associated with the provision of credit resources. And the political crisis in Ukraine, unpredictable scenarios of the development of Russia's military aggression against Ukraine, lead to instability of market processes, as a result of which, the situation in the real estate market can dramatically change. Given this fact, it is possible to conclude that the lack of objective prerequisites for using only the methods of a comparative approach to the valuation of mortgage items.

One of the requirements of banks is the determination of the liquidation value. According to the National Standard No. 1 «General Basis for Valuation of Property and Property Rights» «...liquidation value is the value that can be obtained on the condition that a valuation object is sold on time is significantly shorter than the period of exposure of such property, during which it can be sold for price equal to market value...» [12]. In the international practice of valuation, the terms «liquidation value» (calculated in the process of business valuation) and «liquidation cost» (calculated in the process of valuation of individual assets of the enterprise) are synonymous and determine the amount of funds that can be obtained in the process of liquidating the valuation object [11]. In Ukrainian practice, the term «liquidation value» is associated with the conditions of forced sale, which in the International Valuation Standards is of independent significance. Ukrainian appraisers calculate the liquidation

value by applying lowering coefficients to the market value [13]. However, the price that can be obtained under conditions of forced sale can't be realistically envisaged and will have only a casual connection with the market value or any other valuation base [11]. Taking into account the fact that the convergence of economic systems makes it necessary to standardize the valuation base, let's suggest using the established foreign category device of value types in the evaluation process.

Another norm regulated by the National Standard No. 1 is the obligation to conduct the analysis of the most effective use, which means «...the use of property, as a result of which the value of the valuation object is the maximum...» [12]. The analysis of the most effective use is borrowed from the portfolio theory. In this theory, the main criteria that are used in the process of justifying the option of the most effective use of investments are the necessary level of income and ensuring an optimal balance between income level, risk and liquidity. This theory is based on the assumption of «market efficiency» and «rational behavior» of its players. But:

1. The Ukrainian real estate market does not correspond to the signs of an efficient market. It is characterized by an almost complete lack of reliable information, which determines the features of his research, in particular for the purposes of evaluation.

2. Real estate objects are classified as low-liquid assets. Unlike commodity and stock markets, real estate transactions require a long period of time and, according to the current legislation, state registration.

3. Economic entities in the implementation of operations with real estate are subject to a complex of reflex actions, impulses, moods.

4. Each economic entity does not seek the most effective use or the best alternative, at least the maximum value of the property is not the only criterion. Real estate market participants are prone to irrational behavior and, most likely, they will choose the type of use that meets their own criteria.

The initial criterion for selecting the best and most effective use is the «most likely use» criterion. From the whole set of options, the appraiser must first select only the one that most closely corresponds to the object of evaluation, after which the possibility of such use is substantiated from a legal, physical and economic point of view.

In addition, let's note that the principle of the most effective use in the valuation of mortgage real estate should be applied very carefully. In most practical cases, owners who apply for a mortgage to a bank already use real estate in the most efficient way. Therefore, investing a significant amount of money in a change of current use of real estate, as a rule, is inappropriate for the purposes of mortgage. As an exception, it is possible to consider the situation when the cost of a free land lot significantly exceeds the cost of an improved land site in current use. If the functional assignment of the land plot is changed in accordance with the most effective use option, the bank may consider the issue of project financing. In this case, loan funds are issued for the reconstruction of the facility, that is, a change in its functional purpose.

Market value is determined on a specific date. The European valuation standard is recommended to take into account the longer term in the process of determining the mortgage value, fully or in part will correspond to the

term of the loan. At the same time, the mortgage value is understood as the value of the property, determined by a prudent study of its future liquidity, taking into account long-term aspects, conventional and local market conditions, as well as current and alternative possible use of the property. Speculative elements can't be taken into account when determining the mortgage value [14].

The fact that in the process of determining the value of the pledge subject, it is necessary to take into account the possibility of future forced realization of the appraised real estate object, necessitates the application of additional evaluation procedures, in particular:

- 1) identification and exclusion of any unsustainable speculative moments;
- 2) building a model of the trend of purchase and sale prices or rental of real estate objects, as well as trends in operating expenses and income rates;
- 3) forecasting scenarios for the development of that segment of the real estate market, to whom the evaluated object belongs.

At the same time, it should be borne in mind that the real estate market is a localized market, therefore, modeling of real estate market trends should be carried out taking into account regional urban policy, local economic, political, legal, market, socio-demographic, technological, environmental and cultural-behavioral factors.

Depending on the way the owner uses the real estate can be divided into two groups:

- 1) investment property (property that is used for leasing or retained for profit from subsequent resale). For investment real estate, the criterion of credit reliability can be the amount of cash flows generated by it, the sources of which are rental payments or sales;
- 2) property in use (for living, providing services for production and storage, office and other needs). For the purpose of lending, such property is valued as vacant.

Given the above, it is possible to conclude that the most valuable information in the process of analyzing the mortgage market is information on the price characteristics of the concluded contracts of sale or lease of similar facilities. In doing so, it must be remembered that real estate objects are heterogeneous assets and, accordingly, there are many characteristics of fixed assets and transactions that deal with them. Therefore, every indicator of the real estate object must be determined for a particular level of decomposition and generalization of the structure and processes, and as a result, a multi-level system of values is formed for one indicator.

For example, the prices of offers of sale (lease) of analogical objects are always adjusted depending on their location. This is a general indicator. In this case, it is necessary to take into account not only the location in the settlement (city, city district), but also:

- location relative to the main transport highways and pedestrian flows, as well as their intensity;
- proximity to the streets of city-forming values or main roads;
- convenience of transport communication;
- distance to public transport stops;
- quality of access roads;
- availability of parking space, etc.

For each real estate object, depending on its functional purpose, the current usage forms its own system of values.

One of the most valuable and indispensable resources is the time to evaluate bank deposit items. Market conditions are constantly changing, so the factor of time directly affects all market processes and decisions on the size of mortgage loans. Therefore, according to the author, one of the tools that reflect the dynamics of processes taking place in the mortgage property market can be the dynamics of changes in the average values of the prices of proposals for sale or lease of similar real estate.

In order to determine the general trend of the real estate market, the process of constructing an additive and multiplicative model of the time series of prices for proposals for the sale or lease of real estate can be reduced to the determination of the trend and stochastic component. The stochastic component in this case is the result of the action of random factors, for example, psychological factors that can't be measured [15].

Given the fact that real estate market prices vary in different directions, the n-th polynomial can be used to describe the trend:

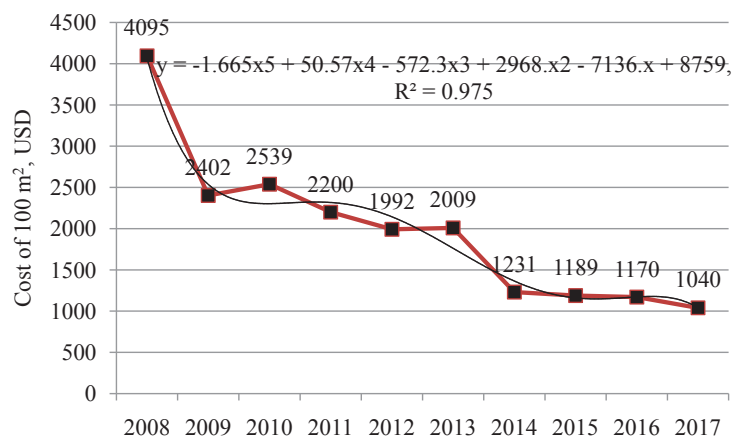
$$y_t = b_0 + b_1t + b_2t^2 + \dots + b_nt^n, \quad (1)$$

where  $y_t$  – the resultant attribute, which is a function of time  $t$ ;  $t$  – the factor sign;  $b_0, b_1, b_2, \dots, b_n$  – the constants of the polynomial;  $n$  – the order of the polynomial.

The order of the polynomial can be determined with the employer of the method of consecutive differences or by means of MS Excel tools. The coefficient of determination  $R^2 \rightarrow 1$ .

For example, Fig. 2 shows the dynamics of changes in the average cost of land (USD/100 m<sup>2</sup>) in Lviv (Ukraine), formed on the basis of data [16]. In order to exclude the influence of the seasonal component, the cost is indicated as of November 1, 2008–2017.

As shown in Fig. 2, despite the fact that Ukraine gradually began to emerge from the long-term crisis in 2017, prices in the real estate market continue to decrease relentlessly. Low level of purchasing power of the population and too high mortgage rates, unstable political and economic situation in Ukraine cause a high level of credit losses and bad loans.



**Fig. 2.** Dynamics of the average cost of land in the city of Lviv (Ukraine) for 2008–2017

## 7. SWOT analysis of research results

*Strengths.* The results of real estate market monitoring conducted during the evaluation of the real estate market monitoring market allow the banks to adequately assess the risks of mortgage lending and make an informed decision on the amount of the loan.

*Weaknesses.* Real estate market analysis is a rather laborious process.

*Opportunities.* One of the tasks of modeling the situation in the real estate market is removing the effect of random factors that can't be measured. The use of fuzzy logic in the monitoring of the real estate market opens the prospect of processing both numerical and linguistic data. This will be the subject of further research.

*Threats.* Unstable economic and political situation in Ukraine, unpredictable scenarios for the development of military operations in the east of the country are the main risk factors for adequate forecasting of real estate market development.

## 8. Conclusions

1. It is determined that the market value should be the basis for valuating mortgage real estate.

2. Taking into account the possibility of future forced realization of the appraised real estate object being pledged, it is determined that additional evaluation procedures should be applied, in particular:

- to identify and exclude any unsustainable speculative points;
- to build models of the trend of prices for the sale or lease of real estate;
- to make a forecast of development scenarios for the segment of the real estate market to which the property under evaluation belongs.

Qualitatively carried out in the process of valuation, monitoring of the market for such facilities will allow banks to assess all the risks associated with the valuated property and take a more informed decision regarding the size of the mortgage loan.

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### МЕТОДИЧЕСКИЕ ОСНОВЫ ОПРЕДЕЛЕНИЯ СТОИМОСТИ ЗАЛОГОВОГО НЕДВИЖИМОГО ИМУЩЕСТВА

Обосновано, что одной из причин возникновения кризисных явлений на рынке недвижимости является недостаточное внимание к качеству аналитической работы. Проанализировано состояние ипотечного рынка в Украине. Определены дополнительные оценочные процедуры, которые необходимо применять в процессе оценки залогового недвижимого имущества. Разработаны методические основы и практические рекомендации по их применению.

**Ключевые слова:** ипотечный рынок, рыночная стоимость, залоговая стоимость, ликвидационная стоимость, мониторинг рынка недвижимости.

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