Dmytro M. Artemenko[1]

SPECIFIC FEATURES OF NON-RESIDENTIAL BUILDINGS APPRAISAL PLEDGED AS COLLATERALS FOR BANK LOANS

This article presents the unified mechanisms of collateral valuation of non-residential buildings for loans. Specific approaches and appraisal methods are developed within national and international valuation standards.

Keywords: *market value; collateral loan; valuation procedures; non-residential buildings; real estate.*

Дмитро М. Артеменко

ОСОБЛИВОСТІ ОЦІНЮВАННЯ ВАРТОСТІ КОМПЛЕКСІВ НЕЖИТЛОВИХ БУДІВЕЛЬ, ЩО ВИСТУПАТИМУТЬ ЗАБЕЗПЕЧЕННЯМ ЗА КРЕДИТНИМИ ОПЕРАЦІЯМИ БАНКІВ

У статті запропоновано уніфіковані механізми розрахунку вартості комплексів нежитлових будівель при кредитуванні, а також конкретні підходи та методи оцінювання, що відповідають національним і міжнародним стандартам оцінювання.

Ключові слова: *ринкова вартість; забезпечення кредиту; оціночні процедури; нежитлова будівля; нерухоме майно.*

Форм. 13. Табл. 1. Рис. 1. Літ. 15.

Дмитрий М. Артеменко

ОСОБЕННОСТИ ОЦЕНКИ СТОИМОСТИ КОМПЛЕКСОВ НЕЖИЛЫХ ЗДАНИЙ, КОТОРЫЕ БУДУТ ВЫСТУПАТЬ ОБЕСПЕЧЕНИЕМ ПО КРЕДИТНЫМ ОПЕРАЦИЯМ БАНКОВ

В статье предложены унифицированные механизмы расчета стоимости комплексов нежилых зданий при кредитовании, а также конкретные подходы и методы оценки, которые соответствуют национальным и международным стандартам оценки.

Ключевые слова: *рыночная стоимость; обеспечение кредита; оценочные процедуры; нежилое здание; недвижимое имущество.*

Problem statement. During the financial and economic crisis, there is an urgent issue for the banking system to provide fast and cheap valuation without additional costs and financial risks for credit transactions for customers.

Taking into consideration the significant contribution of domestic and foreign scholars to the formation of methods for collateral valuation, there is still a lack of unification and formalization of valuation procedures for non-residential buildings used as loan collaterals.

Latest research and publications analysis. The following national and foreign scholars and practitioners have devoted their publications to the collateral valuation: N. Lebid, O. Mendrul, O. Drapikovskij et al. (2003) and the foreign ones: A. Damodaran (2005), G. Harrison (1994), G. Mikeryn et al. (2003).

Taking into consideration their significant contribution to the formation of methods for real property valuation, the economic science fails to provide a full description and calculations for adjustment factors and general formalization of val-

[1] Vadym Hetman Kyiv National Economic University, Ukraine.

uation procedures for the comparative approach, particularly to the valuation of non-residential buildings used as loan collaterals.

The aim of the article is to offer a unified mechanism of adjustment coefficients for the comparative approach of the valuation of non-residential buildings used as loan collaterals.

Key research findings. Bearing in mind that both primary and secondary real estate markets are already formed and there is sufficient information on the property offered for sale, the comparative approach for determining collateral value is the most reliable.

A comparative approach provides the following steps of valuation procedures:

- Search for objects with similar characteristics in the same market area that have been recently sold or offered for sale and the selection of the most suitable objects for comparison.
- Comparison of the real property in question with comparables using sale price adjustment or purchase price adjustment.
- Calculation of a value of the subject property considering the adjustments to the values of comparables.
- Correlation of the calculation results.

Descriptive calculation of adjustments to the comparables.

Selling price adjustment. By valuating subject property, an appraiser analyzes the selling price and not the purchase price of comparatives, that's why the adjustment on selling price for subject property should be made. The value of selling price adjustments from the seller's perspective can be compared with the bank value of loan interest, which may be involved by the seller to cover the deficit of funds during the exposure at the market. The percentage value of price adjustments can be calculated as follows:

$$K_{price} = \left(\frac{1}{(1+R)_T^t} - 1 \right) \times 100\%, \quad (1)$$

where R – the average interest rate for loans in UAH. According to the Internet portal www.finance.ua the interest rate for loans for legal entities is 19%; t – the time of exposure of comparables at the market (it is about 15 months according to real estate agencies). So the adjustment on sale will be 20%.

Adjustment on the total building area is to be made with consideration of the braking rate of Chilton (Chilton coefficient), because there is an exponential dependency between the cost of 1 m^2 of property and its area. The percentage value of adjustments on the total building area can be defined as follows:

$$\left(\left(\frac{S_0}{S_a} \right)^n - 1 \right) \times 100\%, \quad (2)$$

where n – the Chilton coefficient (for complexes of non-residential buildings it is 0.1). S_0 and S_a – the total building area in m^2 of the subject property and the comparables, respectively.

Property's location adjustment. Location adjustment suggests the existence of a discount or premium, taking into account the regional, zonal and local location based on the value of each factor. In our opinion, the value of each factor is deter-

mined as follows: the regional factor – 0.4, zonal factor – 0.3, local factor – 0.3. The percentage value of the adjustments on location can be defined as follows:

$$K_{location} = \frac{M_0 - M_a}{M_0 - M_a} \times 100\%, \quad (3)$$

where M_0 and M_a – the weighted average valuations on location of subject property and the comparables, respectively (on the three-point scale: the higher is the score – the better is the location).

Adjustment on technical condition of buildings. Analyzing the total technical condition of non-residential buildings we can see that the absolute value of the repair cost does not reflect the actual adjustment on technical conditions. This happens due to the underestimation of the market factor: potential investors pay their attention, at first, to functional features of industrial and warehouse buildings such as ceiling height, step of columns, degree of reliability and durability and etc. which are important for their specific business activities, and only then to decoration and design. Of course, if a building is not in an emergency state. We believe that the valuation of the total technical condition should be made, for example, by the following scoring system: excellent state – 4 points, good state – 3 points, satisfactory state – 2 points, unsatisfactory state – 1 point. It is important to use not the absolute value of repair costs but scoring, which corresponds to a particular state of subject property. The percentage value of adjustments on the total technical condition can be defined as follows:

$$K_{condition} = \frac{C_0 - C_a}{C_0 + C_a} \times 100\%, \quad (4)$$

where C_0 and C_a – the weighted average value of subject property and comparables respectively. To reflect the market trends it is better to calculate the adjustment value separately for administrative, industrial and storage buildings using the data approximation by the least squares method according to the equation:

$$y = cx^b, \quad (5)$$

where c and b are constants; x – repair cost in the appropriate condition; y – the cost per 1 m^2 of property in appropriate conditions. The percentage value of adjustment can be defined as follows:

$$K_{condition} = \left(\left(\frac{P_0}{P_a} \right)^b - 1 \right) \times 100\%, \quad (6)$$

where b – the rate determined in Excel as "power trend line"; P_0 – the subject property repair cost; P_a – comparables repair cost. The total percentage value of adjustment for the complex of non-residential buildings is calculated as a weight average value on the area for administrative, industrial and storage units.

Adjustment on the legal status of land. Usually area and legal status (rent, right for permanent use, ownership) of land, which is a set of non-residential buildings, has essential influence on price formation.

We propose to calculate the adjustment value for this factor as follows:

$$K_{land} = \frac{V \times (S_0 \times \alpha_0 - S_a \times \alpha_a)}{A_a} \times 100\%, \quad (7)$$

where S_0 – the land of the subject property in ha; S_a – the land of comparables in ha; V – the ownership cost of a unit area in ha. α_0 and α_a – the coefficients of the land legal status, respectively (empirically determined: for the land in ownership – 1, for the land in constant use – 0,7; for the land in leasing – 0.6). A_a – the cost of comparables.

Adjustment on the degree of reliability and durability. The adjustment coefficients for non-residential buildings are represented in Table 1.

Table 1. **The adjustment coefficients for the degree of reliability and durability**

Degree of reliability and durability	I	II	III	IV	V
I	1	0.98	0.92	0.77	0.71
II	1.02	1	0.94	0.78	0.73
II	1.09	1.06	1	0.84	0.78
IV	1.3	1.27	1.19	1	0.93
V	1.4	1.37	1.29	1.1	1

Source: Procedure for determining the cost of reproduction of buildings for the revaluation of fixed assets. Ratified by the State Committee of the USSR Council of Ministers for Construction as of 14 July 1970.

The weighted average adjustment on the degree of reliability and durability for the complexes of buildings can be calculated as follows:

$$K_{reability} = \frac{K_0 - K_a}{K_0 + K_a} \times 100\%, \quad (8)$$

where K_0 and K_a – the weighted average value of reliability and durability degree of the subject property and comparables, respectively.

Adjustment on functional usage (the area ratio of administrative, industrial and storage units). Administrative buildings are more expensive in comparison with industrial and storage ones, that is why the ratio of areas has a significant impact on the total cost. The adjustment value is calculated by using the regression model (See the equation (5)), where c and b – constants; x – specific weight of the areas of administrative buildings; y – the cost per 1 m^2 of a comparable.

The regression line is constructed by using the Excel function "power trend line" as shown in Figure 1.

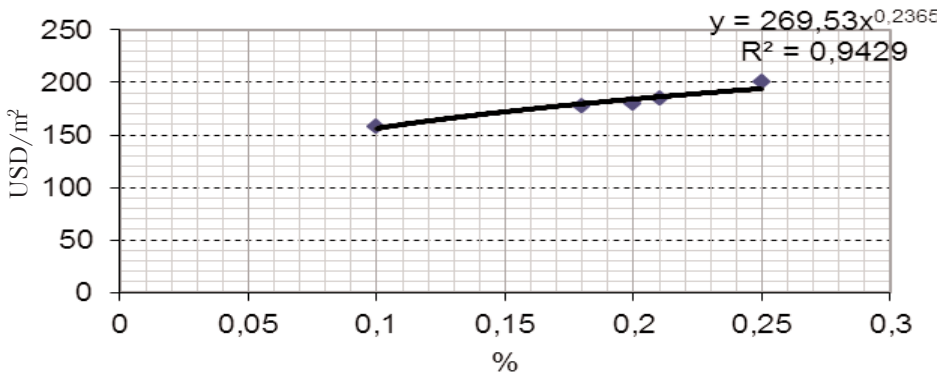

Figure 1. **The dependence of special weight value of administrative units,** *author's development*

Statistically the following scoring system is usually used to describe the accordance of the trend to the dynamic range: 0 – no communication, up to 0.3 – low , from 0.3 to 0.6 – middle, from 0.7 to 0.9 – high, from 0.9 to 1 – the selected trend fully corresponds to the dynamic range. Since the coefficient of approximation reliability is $R^2 = 0.94$, then the approximation fully corresponds to the dynamic range. With the trend equation is fairly easy to calculate the average cost of administrative industrial and warehouse buildings (in accordance with 269.53 and 128 USD/m^2). The percentage value of adjustment can be calculated as follows:

$$K_{usage} = \left(\left(\frac{F_0}{F_a} \right)^b - 1 \right) \times 100\%, \quad (9)$$

where b – the rate (determined by the Excel function "power trend line"); F_0 and F_a – the specific weights of areas of administrative buildings of the subject property and comparables, respectively.

To evaluate the accuracy of calculations, we propose to use the coefficient of variations V, which represents the homogeneity of totality and the relative measure of deviation of individual values from the arithmetic mean, and is calculated as follows:

$$V = \frac{\sigma}{B_{middle}} \times 100\%, \quad (10)$$

where σ – the average square-law deviation; B_{middle} – the average cost value of subject property.

The higher the variation coefficient is, the relatively larger is the variation of individual values of the sampling. If the variation coefficient is less than 10%, the variability of variation range is considered to be low; between 10% and 20% refers to the average; more than 20% and less than 33% – large. If the coefficient of variation is greater than 33%, it indicates the heterogeneity of similar objects selected for comparison. The way out is to search for additional similar property objects or to exclude similar objects with extreme values from calculations. Usually, if $V \leq 33\%$, it is homogeneous, and therefore the weighted average value is a typical and reliable characteristic of a market value of the building under appraisal.

After calculation of the total costs of non-residential buildings we can define the costs of each building separately according to its technical condition and the degree of reliability and durability. To do this, firstly, we determine the average cost per 1 m^2 of administrative, industrial and warehouse buildings. The average price of 1 m^2 of administrative buildings is calculated by substituting in equation trend line (Figure 1) with $x = 1$, then it is easy to calculate the average cost per 1 m^2 of industrial and warehouse buildings as follows:

$$\upsilon_b = \frac{V_0 - S_a \times \upsilon_a}{S_b}, \quad (11)$$

where V_0 – the total value of appraising buildings. S_a and S_b – the area of administrative, industrial and warehouse units. v_a and v_b – the average cost of 1 m^2 of administrative, industrial and warehouse units, respectively.

The cost of each building separately can be calculated by the formula:

$$\frac{\upsilon \times c_i \times k_i \times s_i}{\sum_{i=1}^{n} \frac{s_i \times c_i \times k_i}{s}}. \quad (12)$$

After transformation:

$$\frac{\upsilon \times c_i \times k_i \times s_i \times s}{\sum_{i=1}^{n} s_i \times c_i \times k_i}, \quad (13)$$

where v – the average cost per 1 m^2 of administrative or industrial and warehouse unit, respectively. c_i – relative technical condition score (calculated as the ratio of technical condition score of N-building to the weighted average score of technical conditions of administrative or industrial and warehouse unit, respectively). k_i – relative score of the reliability and durability degree (calculated as the ratio of score of reliability and durability degree of N-building to the average score of reliability and durability degree of administrative or industrial and warehouse units, respectively). S_i – the total area of N-building and S-total area of administrative or industrial and warehouse units, respectively.

In this way we have formalized the process of valuation and determined the value of each building of non-residential complexes, taking into account such features as: sale price, location, total area, total technical conditions, area and legal status of land, degree of reliability and durability, functional usage.

Conclusion. The cost approach does not reflect the current state of the property market, and also requires significant investments of time and money. Therefore, the application of this approach is not feasible within the calculation of the cost of collateral loan. Due to limited market data, by which the current leasing market of non-residential building complexes is characterized, the usage of the income capitalization approach is also not possible to determine the cost of collateral loan. Thus, both primary and secondary real estate market have already been formed and there is sufficient information about selling prices of offered property, so the comparative approach is the most reliable one.

This article presents a unified algorithm for cost calculation of each building that is a part of non-residential building complex concerning selling price, location, total area, total technical conditions, area and legal status of land, degree of reliability and durability, functional usage. It allows using the minimum number of input parameters (information on comparables), in short terms to obtain mathematically valid results with sufficient accuracy. In terms of market relations it is an important factor of competitive advantage.

The represented algorithm allows realizing this method of calculation for a software program. Thus we get control over the valuation process: the elimination of "customized" calculations in order to please the customer and the protection of customers from a biased appraisal.

References:

Про банки і банківську діяльність: Закон України від 07.12.2000 №2121-III // zakon.rada.gov.ua.

Про заставу: Закон України від 02.10.1992 №2654-XII // zakon.rada.gov.ua.

Про затвердження Методики оцінки майна: Постанова Кабінету Міністрів України від 10.12.2003 №1891 // zakon.rada.gov.ua.

Про іпотеку: Закон України від 05.06.2003 №898-IV // zakon.rada.gov.ua.

Про оцінку земель: Закон України від 11.12.2003 №1378-IV // zakon.rada.gov.ua.

Про оцінку майна, майнових прав та професійну оціночну діяльність в Україні: Закон України від 12.07.2001 №2658-III // zakon.rada.gov.ua.

Про затвердження Національного стандарту № 1 «Загальні засади оцінки майна і майнових прав»: Постанова Кабінету Міністрів України від 10.09.2003 №1440 // zakon.rada.gov.ua.

Про затвердження Національного стандарту № 2 «Оцінка нерухомого майна»: Постанова Кабінету Міністрів України від 28.10.2004 №1442 // zakon.rada.gov.ua.

Загальна частина до збірників УПВВ будівель та споруд для переоцінки основних фондів: Затверджена Державним комітетом Ради Міністрів СРСР у справах будівництва від 14.07.1970 // www.ocenka-notarius.net.

Положення про порядок формування та використання банками України резервів для відшкодування можливих втрат за активними банківськими операціями: Постанова Правління Національного банку України від 25.01.2012 №23 зі змінами та доповненнями // zakon.rada.gov.ua.

Дамодаран А. Инвестиционная оценка: Инструменты и методы оценки любых активов / Пер. с англ. – 2-е изд., исправл. – М.: Альпина Бизнес Букс, 2005. – 1341 с.

Микерин Г.И., Гребенников В.Г., Нейман Е.И. Методические основы оценки стоимости имущества. – М.: Интерреклама, 2003. – 688 с.

Оценка имущества и имущественных прав в Украине: Монография / Н.П. Лебедь, А.Г. Мендрул, В.С. Ларцев, С.Л. Скрынько, Н.В. Жиленко, А.И. Драпиковский, И.Б. Иванова; Под ред. Н.П. Лебедь. – Изд. второе, перер. и доп. – К.: Принт-Экспресс, 2003. – 716 с.

Статистика / Р.В. Фещур та ін. – Львів, 2001. – 273 с.

Харрисон Г. Оценка недвижимости: Учеб. пособие / Пер. с англ. – М.: РІО Мособлуполиграфиздата, 1994. – 231 с.

Стаття надійшла до редакції 23.04.2014.