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Financial and estimating indicators for assessment of mortgage lending value

The article proposes a calculation criteria for the determination of the mortgage lending value which originates from the application of the financial method (direct capitalisation), by adopting a capitalisation rate calculated by means of the Debt Coverage Ratio (DCR), taking into consideration the criteria set out by the mortgage lending value, that is (i) prudent appreciation of the future marketability, (ii) normal and local market conditions, (iii) current use and (iv) long-term sustainability of the property.

1. Introduction

Some Credit Institutions appoint experts to determine not merely the market value of a property as the security for a credit exposure but also the mortgage lending value, the calculation of which is based, in the majority of cases, on a percentage reduction to the market value.

Basically, the estimation of the mortgage lending value implies the problem of its quantitative measurement since it is a risk analysis more than an estimation.

The mortgage lending value must therefore be calculated using appropriate methods, circumstances adequate for the assessment and on the basis of sufficient information to support the analyses and the conclusion.

This paper refers to the problem of assessing the mortgage lending value by examining the debt coverage ratio in the direct capitalisation method and the final capitalisation rate in the financial capitalisation method.

2. Mortgage lending value

The *Mortgage Lending Value* (*MLV*)[1] differs from the market value, which is applied in the assessment of properties used as security for credit exposures and

[1] The first country to introduce the concept of a "safe" (cautionary) value within property assessments was Germany more than a hundred years ago with the *Hypothekenbankgesetz* (bank-

linked with property leasing agreements for the purpose of granting the loan (*International Valuation Standards*, *IVA* 2, *IVS*).

The *IVS* adopt the definition of the Mortgage Lending Value[2] contained in the Directive of the European Parliament no. 2006/48/EC dated 14 June 2006 relative to the activities of credit institutions "*The mortgage lending value is defined as the value of the property as determined by a prudent assessment of the future marketability of the property taking into account long term sustainable aspects of the property, the normal and local market conditions, and the current use and alternative appropriate uses of the property. Speculative elements shall not be taken into account in the assessment of the mortgage lending value. The mortgage lending value shall be documented in a clear and transparent manner*".

With regard to the mortgage lending value, it should be noted that:

- *MLV* is the value of a property determined by an valuer who has carried out a prudent assessment of its future marketability, taking into consideration the long term sustainable aspects, the normal and local market conditions, the current use and the possible alternative uses;
- the assessment of the *MLV* must not take into account speculative elements;
- the assumptions used for assessing the mortgage lending value must derive from a thorough knowledge of the historical trend of the property market and a critical examination of the current conditions and the trends, especially from a risk point of view[3];
- in order to avoid doubts on the application of the mortgage lending value, it should be noted that it may not be calculated by a simple percentage deduction from the market value[4];
- the mortgage assessment can not be based on the property prices and on the list prices of the brokerage firms and agencies[5].

The definition of the mortgage lending value introduces a concept which may be described as an attenuation of the market trends, rentals and capitalisation rates. The sustainability of the mortgage lending value may require adjustments to the actual income of the property, to the discount or capitalisation rate and to the management and administration costs of the property[6].

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ing directive on loans), which was updated in 2005 with the current *Pfandbriefgesetz* (banking directive on *covered bonds* – structured with a low risk profile and a high liquidity). The aim of the mortgage lending value in Germany was to protect savers as the risk in *covered bonds* remains with the issuer unlike with *securitization* operations in which the loans secured by properties are converted into shares and placed on the market, thereby placing the risk fully on the investors.

[2] The *mortgage lending value* is also defined as the *mortgage loan value.*

[3] Tecnoborsa: *Code of Property Assessments III*. Tecnoborsa, Rome, section 12, point 3.5.

[4] TEGoVA: *European Valuation Standards* 2009. TEGoVA, London, EVA 2.4.10.

[5] Tecnoborsa: *Code of Property Assessments III*. Tecnoborsa, Rome, section 12, point 3.10.1.

[6] TEGoVA: *European Valuation Standards* 2003. TEGoVA, London, EVA 2.4.8(s).

3. Debt coverage ratio

It is normal practice in real estate finance to use two indicators to examine a credit exposure secured by real estate collateral (property): the first indicator is the percentage of the loan on the market value of the collateral (*Loan to Value*, *LTV*) and the second is the *Debt Coverage Ratio (DCR*).

The *LTV* is the ratio between the amount of the loan and the market value of the collateral. The *DCR* is the ratio between the annual income provided by the collateral and the loan repayment:

$$DCR = \frac{R}{Q} \tag{1}$$

where:
R = net annual income (*euro/year*);
Q = annual repayment instalment (*euro/year*).

The *DCR* aims to verify the condition by which loan instalment may be repaid by the income; when $DCR > 1$ the income is greater than the repayment instalment; when $DCR < 1$ the income is less than the repayment instalment; for $DCR = 1$ the income is equal to the repayment instalment.

The two indicators each influence the annual repayment instalment which is equal to:

$$Q = LTV \cdot V \cdot \frac{r}{1-(1+r)^{-m}} \tag{2}$$

where:
V = market value of the collateral (*euro*);
r = annual interest rate of the loan;
m = duration of the loan (*years*).

Consequently, by replacing formula [2] in formula [1], the *DCR* is equal to:

$$DCR = \frac{R}{LTV \cdot V \cdot \frac{r}{1-(1+r)^{-m}}} \tag{3}$$

A property has been bought for 285,000.00 *euros* with a loan of 228,000.00 *euros* at the annual interest rate of 5.65% with a duration of twenty years, the *LTV* is therefore:

$$LTV = \frac{228.000{,}00}{285.000{,}00} = 0{,}80.$$

The annual repayment instalment from formula [2] is:

$$Q = 0{,}80 \cdot 285.000{,}00 \cdot \frac{0{,}0565}{1-(1+0{,}0565)^{-20}} = 19.317{,}02.$$

Taking into consideration that the collateral has an annual net income of 14,400.00 *euros*, the debt coverage ratio of the formula [1] is equal to:

$$DCR = \frac{14.400{,}00}{19.317{,}02} = 0{,}75.$$

On the assumption that, for the purpose of the risk assessment, the bank which made the loan considered a *DCR* equal to one as the parameter for assessing the risk, the loan percentage could have been calculated from the formula [3] determining *LTV* as follows:

$$LTV = \frac{Q}{DCR \cdot V \cdot \frac{r}{1-(1+r)^{-m}}} = \frac{14.400{,}00}{1 \cdot 285.000{,}00 \cdot \frac{0{,}0565}{1-(1+0{,}0565)^{-20}}} = 60\%,$$

with this assumption, the *LTV* represents the maximum loan limit.

The debt coverage ratio is not merely a risk assessment parameter but it is also instrumental in determining the market value of a property with the direct capitalisation method and, specifically, for calculating the rate of capitalisation.

Indeed, the capitalisation rate *s* in the direct capitalisation method is equal to

$$s = \frac{R}{V} \tag{4}$$

DCR may be used to calculate the direct capitalisation rate; formula [*3*] gives:

$$s = \frac{R}{V} = DCR \cdot LTV \cdot \frac{r}{1-(1+r)^{-m}}.$$

By applying the data from the previous simplification, it is possible to calculate the direct capitalisation rate in both the *LTV* hypotheses considered:

$$s = 0{,}75 \cdot 0{,}80 \cdot \frac{0{,}0565}{1-(1+0{,}0565)^{-20}} = 5{,}08\%;$$

$$s = 1 \cdot 0{,}60 \cdot \frac{0{,}0565}{1-(1+0{,}0565)^{-20}} = 5{,}08\%.$$

Formula [4] gives the market value of the property with the direct capitalisation method:

$$V = \frac{14.400{,}00}{0{,}0508} \cong 283.000{,}00\,euro.$$

The *DCR* is, therefore, a risk assessment parameter which allows: *a*) calculation of the capitalisation rate; *b*) determination of the market value by means of an estimating procedure for income capitalisation.

4. Final capitalisation rate

The mortgage lending value in many market situations is probably lower than the market value due to the expectations relative to the long term trends; whilst in a stable market situation the mortgage lending value may be indistinguishable from the market value[7].

Even though the mortgage lending value of the properties for the purpose of granting the loan differs from the market value, its estimation is carried out with the procedures and methods planned by the international standards for estimation of the market value. This is possible since the mortgage lending value is a value derived from the market value whilst varying the assumptions on the parameters of the market segment of the property to be assessed, and in particular on any change in its use, supply and demand, market status and long term trends of the price level.

As part of the processes for income capitalisation, the long term aspects remain unexpressed in the direct capitalisation method due to the simple relationship between the net income and the capitalisation rate. In the financial capitalisation method, these aspects emerge in the income variation rates, the fixing of the duration of the availability period and in estimating the final resale value of the property. The financial capitalisation method considers the series of incomes and expenditures from the time of the purchase to the time of the resale of the property to be assessed, forecasting a final market value. In this method, the market value of the property to be estimated is equal to:

$$V = R \cdot \frac{1 - \left(\frac{1+l}{1+s_f}\right)^n}{s_f - l} + \frac{R_n}{s_n} \cdot \left(1 + s_f\right)^{-n}, \tag{5}$$

where:
R = net income of the first year of the property to be assessed (*euros/year*);

[7] TEGoVA: *European Valuation Standards* 2009. TEGoVA, London, EVA 2, 4.3, 4.4.

l = annual rate of variation of the net income;
s_f = capitalisation rate in the financial capitalisation method;
R_n = net income of the last year of the property to be assessed (*euros/year*);
s_n = final capitalisation rate (*going out rate*);
n = duration of the period of availability *(years)*.

In the financial capitalisation method, the estimation of the final resale value V_n is carried out with the direct capitalisation method and concerns the net income of the last year of the availability period and the final capitalisation rate in the following manner:

$$V_n = \frac{R_n}{s_n}.$$

When seeking the final capitalisation rate the changes in the market expectations are also considered beyond the period of availability, in accordance with the expectations of the investors in the market segment of the property to be assessed. In general, with an increase in the duration of the availability period the risk of the investment is considered to be greater and, consequently, the final capitalisation rate is greater than the corresponding direct capitalisation rate considered at the time of the valuation. In these circumstances, the final rate is generally, but not necessarily, greater than the direct capitalisation rate. The final rate must also reflect the greater uncertainty present in the estimate of the net income at the end of the availability period.

In order to determine the final capitalisation rate it is necessary to consider the changes in the market expectations. The forecast for these changes may be seen: from the annual rate of variation l of the net income, which leads to the net income of the last year of the property to be assessed in the following manner:

$$R_n = R \cdot (1 + l)^n; \tag{6}$$

and from the annual rate of variation d of the current market value, which leads to the resale value in the following manner:

$$V_n = V \cdot (1 + d)^n. \tag{7}$$

The final capitalisation rate, considering the ratio between the income planned with the formula [6] and the increased or decreased resale value of formula [7], is then equal to:

$$s_n = \frac{R_n}{V_n} = \frac{R \cdot (1 + l)^n}{V \cdot (1 + d)^n} = \frac{R}{V} \cdot \left(\frac{1 + l}{1 + d} \right)^n, \tag{8}$$

In this formula [8], the final capitalisation rate may be expressed as a function of the direct capitalisation rate:

$$s_n = s \cdot \left(\frac{1+l}{1+d} \right)^n .$$

Applying the date from the previous simplification, the final capitalisation rate may be calculated assuming an annual rate of increase of the net income (l) equal to 1.30%, an annual rate of revaluation of the prices (d) equal to 1.00% and a time period (n) of 15 years:

$$s_n = 0{,}0508 \cdot \left(\frac{1+0{,}013}{1+0{,}01} \right)^{15} = 0{,}0531.$$

For the purpose of the simplification, the capitalisation rate in the financial capitalisation method (s_f) is set at 0.06176.

The net income of the last year of the property to be assessed (R_n) is equal to:

$$R_n = 14.400 \cdot (1+0{,}013)^{15} = 17.478{,}50 \,\text{euro/year}.$$

The market value of the property is calculated with formula [5] using the financial capitalisation method:

$$V = 14.400{,}00 \cdot \frac{1 - \left(\frac{1+0{,}013}{1+0{,}06176} \right)^{15}}{0{,}06176 - 0{,}013} + \frac{17.478{,}50}{0{,}0531} \cdot (1+0{,}06176)^{-15} \cong 283.000{,}00 \, euro.$$

5. Conclusions

The mortgage lending value is different from the market value, but the same assessment methods planned for the market value are applied for its estimation, as the mortgage lending value is a market value with specific assumptions relating to the parameters of the market segment of the property to be assessed. Therefore, the valuer who estimates the mortgage lending value of a property must also indicate the market value and explain the difference between the two values.

In order to estimate the mortgage lending value and explain the difference with the market value it is necessary to present the underlying assumptions, which must be mentioned in the assessment report and quantified in the estimate. For this purpose, financial and estimating indicators may be used. The debt coverage ratio is a financial index which allows estimation of the capitalisation rate in

the direct capitalisation method; the final capitalisation rate is the rate to be applied in the estimation of the final value and may be estimated on the basis of the indexation rate of the incomes and the decrease/increase rate of the market price.

The mortgage lending value must be documented in a clear and transparent manner and it must be clarified to the users that this value may not be achieved if the assumptions on which it is based are not realised.

Bibliograghy

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