NECESSITY OF RISK ESTIMATION, CLASSIFICATION OF LOANS IN BUCKET AND ADJUSTING THEM

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Abstract:

Financial assets that are mainly represented by loans or similar investments are produced and controlled by credit institutions. These, together with the services, can contribute to a sustainable economic development, sometimes under conditions of risk and uncertainty. Among the financial assets existing on the market, credit can be a strategic pillar for the development of Romania's economy in a healthy economic environment. However, in an economic environment perceived as having a high risk determined by different internal factors, the financial intermediation offered by the credit institutions can be negatively influenced.

The size of the bad loans and the estimation of the risks for adjusting the loans according to their categories, determines the credit institutions to find the best models of risk assessment.

IFRS 9 introduces a new approach regarding the classification of financial assets, determined by the business conditions of the credit institutions, that is how a bank manages, under financial risk conditions, to generate the cash flows. In this paradigm, the contractual cash flows from the banking business representing exclusively payments of the principal and of the interest related to the value of the principal due, eliminates the categories of classification of the financial assets stipulated in IAS 39. and their proper adjustment. The research methods used in this study are: observation, grouping and comparison.

Keywords: risk buckets; amortized cost; fair value; debt service, rating categories.

Classification JEL: : E42, E50, F30

1. INTRODUCTION

According to IFRS 9, the new classification of products in the form of bank loans comprises *three main categories of financial assets* called, depending on the risk group transactions (risk buckets) in a technical way. In order to fit into these categories, the financial assets placed will be [1]:

- estimated at *amortized cost*, if: (a) the financial asset is held as part of a business model whose objective is to hold financial assets in order to collect contractual cash flows and (b) the contractual terms of the financial asset give creation of cash flows that are exclusively payments of the principal and of the interest related to the value of the principal due;
- estimated at *fair value through other elements of the overall result*, if (a) the financial asset is held within a business model whose objective is achieved both by collecting the contractual cash flows and by selling the financial assets and (b) the contractual terms of the financial asset give rise to cash flows that are exclusively payments of the principal and the interest related to the value of the principal due;
- measured at *fair value through profit or loss*, if not measured at amortized cost or at fair value through other comprehensive income.

Depending on the risk estimate, in order to calculate adjustments for expected losses, related to receivables from operations with customers, in accordance with the provisions of IFRS 9, the credit institutions will proceed to classify the existing credits in the portfolio (the credits highlighted in the balance sheets) in one of the following buckets:

- *Bucket 1* (hereinafter referred to as B1) = will include loans where the risk has not increased significantly;

- *Bucket 2* (hereinafter referred to as B2) = it will include loans where the risk has increased significantly compared to the initial recognition but which are not impaired;
- *Bucket 3* (hereinafter referred to as B3) = will include the impaired loans at the reporting date and the impaired loans at the initial recognition.

2. Estimate the debt service according to the rating

The credit institutions will proceed to establish the initial rating based on the total score obtained from the non-reimbursement "risk sheet" for clients of natural persons, authorized natural persons (PFA) and legal persons (PJ).

For example, for clients of natural persons type, based on the score obtained from the non-reimbursement sheet at the date of grant, existing in the database, a rating class is assigned which will continue to be used as the initial rating. This risk statement includes the following indicators:

- The nature of the client's income;
- The value of the revenues of the client and the co-payers;
- The client's housing situation;
- Duration of residence at the same address of the client;
- The client's working age;
- The civil status of the client;
- The client's age;
- The field in which the client operates;
- The professional training of the client;
- Information registered in the databases of the CRC and the Credit Bureau.

After establishing the rating, the credit institutions will proceed to *estimate the debt service*.

According to the mathematical models and formulas [2], the estimation of the debt service is performed automatically in the computer application based on the polynomial function of degree 2, as follows:

Function $f : \mathbb{R} \to \mathbb{R},\ f(x) = ax^2 + bx + c,\ a, b, c \in \mathbb{R},\ a \neq 0$ is called second degree polynomial function (or quadratic function) with the coefficients $a, b, c.$

For the second degree function ax^2 it is called the second (or quadratic) term, bx the term of the first (or linear) degree, and c free term.

Equation $ax^2 + bx + c = 0$ is called the equation attached to the function $f(x) = ax^2 + bx + c$, and $\Delta = b^2 - 4ac$ we call the discriminant of the equation the function discriminant of the function.

The real roots of the equation (if any) are called function zeros.

<u>Exemple:</u>

1. $f(x) = 3x^3 - 5x + 1 :\ a = 3,\ b = -5, c = 1$
2. $i(x) = x^2 + 3 : a = 1,\ b = 0,\ c = 3$
3. $g(x) = 4x^2 - x : a = 4, b = -1, c = 0$

The polynomial function of degree 2 takes into account the debt service registered by the client during the last six months and based on it, he estimates the debt service for the next month.

If, according to the previous specifications, a score has been obtained for the AAA, AA or A rating categories, and the debt service estimated for the following month is more than 60 days, the score obtained when ranking in the rating categories will be adjusted as follows:

- for PF clients the score will be reduced by 15.75 points (lowering the rating by 3 classes),
- in the case of PFA and / or PJ type clients, the score will be reduced by 14.55 points (lowering the rating by 3 classes).

In the situation where according to the previous provisions a score was obtained for the BBB, BB or B rating categories, and the debt service estimated for the following month is less or not more than 60 days, the score obtained in the rating categories will be adjusted as follows:
- for PF clients the score will be increased by 15.75 points (rating increase by 3 classes),
- for PFA and / or PJ type clients the score will be increased by 14.55 points (rating increase by 3 classes).

3. Evaluation of the direct classification criteria in the rating category

The credit institutions will proceed directly to rating B and assigning a fixed score of 5 points for clients of natural persons type, respectively assigning a fixed score of 7 points for clients of type authorized natural persons or legal persons if the one is fulfilled at least one of the following conditions:

a. Financial or personal difficulties of the client that are proven by the client regardless of the debt service,
b. It does not have a movable mortgage on the client's current account, it has received/registered an acknowledgment on its current account and there is also other information that together can be a proof of the impairment,
c. Payment notification,
d. The company has entered into general insolvency and the judge has not yet approved the reorganization plan
e. The company that is in general insolvency respects the reorganization plan (the rate according to the due date or the reorganization plan, as the case may be)
f. The restructured exposure is non-performing at the restructuring date, and the credit is found during the grace period and / or during the observation period.

The credit institutions will proceed directly to rating D and assign a fixed score of -10 points for clients of natural persons, respectively assigning a fixed score of -7 points for clients of authorized individuals or legal persons if it is fulfilled at least one of the following conditions:Serviciul datoriei este mai mare de 90 de zile;

a. The loan was declared due in advance;

b. The interest due to the obligation from loans is no longer accounted for (in this case all loans with interest 0 from the portfolio will be taken into account)

c. Suspicions of fraud were identified;

d. Exposure to a certain debtor, with arrears greater than 90 days, represents at least 20% of the gross value of all the balance sheet exposures to the respective debtor;

e. The credit institution initiates the forced execution procedure;

f. The debtor is in a state of bankruptcy or simplified insolvency (state F). From the general insolvency the liquidation (state F) was decided. The credit rate is not included in the reorganization plan - F state.

g. There is information according to which the directors, shareholders or the non-financial entity are the subject of a criminal case concerning economic crimes.

If, following the revaluation of the rating, a financial asset must migrate to a better bucket, respectively:

- Bucket 3 >>> Bucket 2
- Bucket 3 >>> Bucket 1
- Bucket 2 >>> Bucket 1

this will only happen after a minimum stay of 60 days since the last re-placement in the bucket. During the period of stay in bucket 2, financial assets that do not have a direct marking in bucket 2, will remain in the category of high-performance receivables.

4. Risk assessment and evaluation of the use of ratings in lending processes

The risk estimates made by the credit institution are based on historical experience, but must be equally anticipatory.

Rating systems must effectively differentiate risk - ie, loans with a lower rating must have a higher risk of loss - and effectively calibrate it - respectively, rating systems must accurately quantify the risk of loss. . Rating systems must also be consistent.

The validation carried out by the credit institutions must essentially aim at assessing the predictive capacity of risk estimates, as well as evaluating the use of ratings in lending processes. The validation must focus on the assessment of the anticipatory accuracy of the risk estimates, on the evaluation of the processes for allocating these estimates, on the control and monitoring procedures implemented to ensure the anticipatory accuracy of the estimates is maintained in time.

If the actual results differ significantly from the expected ones, the validation process must determine a re-evaluation of the approach parameters based on internal rating models.

In order to ensure *the predictive accuracy of the risk estimates*, as well as the discrimination and the effective calibration of the risk, the credit institution must first assess the degree of general adequacy of each rating system, an evaluation covering at least the following aspects:

a) checking the extent to which each rating system is characterized by an appropriate balance between *objectivity, accuracy, stability and prudence*;

b) evaluation of the adequacy of the philosophy of each rating system.

The accuracy of a rating system, the credit institution must adopt policies and standards regarding the expected performance of the rating system - results in forecast report -, the integrity of the entry data in the rating system and their transformation into results.

Regarding the *objectivity of a rating system*, credit institutions must adopt policies and standards that ensure the consistent allocation of ratings and estimates, debtors and transactions with similar characteristics and a similar level of risk. Credit institutions must have the ability to verify how the use of professional reasoning is administered to achieve consistent results.

For the purposes of comparing results against expected performance, credit institutions must be able to identify how their estimates have been adjusted based on the most likely outcome.

With regard to the *stability of a rating system*, the credit institution must adopt policies and standards that ensure that ratings and estimates remain largely unchanged as long as the related risk has not changed. This should not prevent changes that are inherent in the rating philosophy of the system.

Regarding the *prudence of a rating system*, the credit institution must adopt policies and standards that identify the sources and the uncertainty margin in ratings and estimates, as well as the degree of prudence. In particular, policies must identify where the precautionary principle is applied and explain how it is applied by credit institutions.

However, the philosophy of a rating system is characterized by two components:

1. the philosophical component underlying the allocation by rating classes or risk groups - respectively the way in which credit institutions allocate exposures, debtors or transactions of risk groups (risk buckets) according to the appropriate risk determinants;

2. the method used to quantify the risk parameters associated with each rating class or risk group (bucket).

Each philosophy that underlies the allocation by rating classes or risk groups (*risk buckets*) determines a specific dynamic of the ratings, which can be characterized by the extent to which a change in the economic conditions is likely to determine:

1. a net migration of a high number of exposures, debtors or transactions to other rating classes or risk groups, provided that the credit institution would not take any compensatory measures; or
2. in opposition to the previous situation, the migration of certain exposures, debtors or transactions to other rating classes or risk groups, exclusively due to their individual characteristics, while the number of exposures, debtors or transactions in each rating class or group the risk remains substantially unchanged;
3. a combination between the two extremes mentioned in letter. a) and b).

To assess the adequacy of the philosophy of a rating system, the credit institution must:

1. have a good understanding of the philosophy that underlies the allocation by rating classes or risk groups (buckets). In particular, on the risk determinants, as well as the fact that they create homogeneous risk groups in relation to the estimator concerned - an example for the default probability parameter is the following:

- if the groups are homogeneous in relation to the probability that each debtor in each of the risk groups will enter the default status during the following year, taking into account all the current information available, including information about the debtor and economic information;
- or, alternatively, if the groups are homogeneous in relation to the probability that each debtor in each risk group will enter into default during the following year, taking into account all available information and the economic conditions of the hypothetical crisis scenarios;

2. to evaluate whether the method used to quantify the risk parameter is appropriate to the philosophy underlying the allocation by rating classes and risk groups;
3. have a good understanding of the characteristics, including the dynamics, related to the ratings and estimates of the risk parameters;
4. to evaluate the adequacy of the resulting characteristics, including the dynamics, related to the ratings and estimates of the risk parameters in relation to their different uses;
5. have a good understanding of the impact of the characteristics, including the dynamics, related to the ratings and estimates of the risk parameters on the dynamics and volatility of capital requirements.

The credit institution must, at least, adopt and formalize policies that explain both the philosophy of each rating system and the expected variation of rating classes, risk groups and risk parameters in relation to changes in the general economic cycle or the more specific cycles, relevant to each risk parameter. These policies should include a description, if applicable, of how rating allocations and risk parameter estimates are affected by the application of the precautionary principle.

If a credit institution uses different rating systems characterized by different philosophies, it must pay particular attention to the use of information. These are either for rating allocation or for estimates - coming from another rating system, internal or external, with a different rating philosophy. An example of this is the use of rating information or experience regarding the entry into non-repayment status obtained from the rating agencies.

If a credit institution uses different rating systems with different characteristics, presented above (different philosophies, levels of objectivity, accuracy, stability or prudence) the bank must ensure that the respective systems have an adequate level of coherence and that the differences between them are well understood. Understanding the existing differences must, at least, enable the credit institution, when necessary, to define an appropriate way of combining the information provided by the different rating systems. The assumptions and potential inaccuracies that arise from such a combination / aggregation must be fully understood by the credit institution.

The credit institution must at least describe how the combination of information from rating systems characterized by different philosophies influences the dynamics and volatility of capital requirements.

Estimates of future repayment frequencies and future losses made by the credit institution should be based on historical data, but these data are only a starting point and should be carefully adjusted. Minimum data observation periods - 5 or 7 years - determine the minimum historical experience required as input data for anticipatory estimates and do not imply that an average of actual experience is a sufficient measure for those estimates.

If a credit institution can prove that historical experience is likely to be an accurate estimate for them, adjustments may only be needed to a limited extent or may not be needed anymore.

Anticipatory estimates may be lower than actual historical experience. Such situations may arise because of a small sample size, a historical experience that includes a disproportionately large number of extremely unfavorable years, or because of changing practices. The credit institution must properly justify cases where it ignores or assigns a significantly lower weight to some of the available data.

For the purposes of estimating the probability of default based on the long-term average of the default rates in each rating class or risk group, historical experience should include a representative combination of favorable and unfavorable years for the economy as a whole, as well as take considering the more specific cycles - such as those at the industry level -, which are significant for the level and volatility of the non-reimbursement entries corresponding to the exposures covered by the rating system. Credit institutions must demonstrate that the estimates used are representative of likely long-term rates.

Appropriately for the purposes of estimating the loss in the event of repayment and the conversion factor based on weighted averages based on the number of non-repayment states.

Credit institutions must have policies and standards regarding the levels of accuracy - and, where relevant, the power of discrimination -, the acceptable levels of divergence from the expected performance, as well as the actions to be taken in situations where they are levels are exceeded. Credit institutions should also have clear policies regarding the circumstances under which these standards can be modified.

"The data of the Bank of International Regulations also indicate a possible higher accuracy of the risk hierarchy of debtors by the models used by such new financing providers, compared with the estimates made by the existing credit bureaus." [3]

5.Reassessment rating during the course of the loan

Key performance indicators (KPI) score calculation

In order to be able to identify whether the risk has increased significantly or not compared to the initial recognition, at the end of each month the credit institutions will proceed to reassess the rating and compare it with the initial rating. For this purpose, the key performance indicators KPI presented in annex no.1-for clients of *natural persons type*

Key performance indicators (KPIs) for clients of individuals Annex no.1

Nr. Crt.	PF evaluation criteria	Scores	Adjustment	Assigned score
1	**Nature of the client's income:**		**20%**	
	-from salaries / pensions	40	8	
	-from regulated professions / authorized activities, and from management and administration contracts	30	6	
	- from agricultural / forestry activities and from social insurance benefits	25	5	
	- from rents, dividends, interest	20	4	
	- from contracts for copyright, sales commissions, unemployment or no work place	10	2	

	- no income	-20	-4	
2	**Value of the client's and co-payers' incomes:**		**20%**	
	- over 1,500 lei inclusive	40	8	
	- between 450 lei including and 1,500 lei exclusively	below 1500 score = maximum ((salary-450) / 26.25, 0)	the factor of 26.5 = (1500-450) / 40	
	- between 150 lei inclusive and 450 lei exclusively	0	0	
	- up to 150 lei exclusively,	-20	-4	
3	**Non-repayment risk class and debt service:**		**15%**	
	- low or medium risk of default	20	3	
	- high default risk and without delay in payment of rates	10	1.5	
	- high default risk and debt service up to 30 days, inclusive	0	0	
	- high default risk and debt service within 30 days exclusively - 60 days inclusive	-10	-1.5	
	- high default risk and debt service between 60 days exclusively - 90 days inclusive	-20	-3	

The benefits of organizing risk-oriented processes will be found at all levels, both individually and in the portfolio. Professionalism, efficiency, responsibility, confidentiality, integrity, compliance with standards, impartiality, transparency, loyalty, and human quality are just a few supporting elements for strategies for analysis, identification, evaluation, monitoring reporting, and risk management. [4]

6. CONCLUSIONS

Credit rating and credit risk models differ from bank to bank. They are used in the classification of loans in bucket and constitute an additional informational resource for analyzing the risk profile of credit institutions.

The adjustment of the loans following the classifications in the three categories of budgets helps the credit institutions to properly evaluate their performance indicators and to close the financial year as correctly as possible.

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