

**METHODOLOGY
FOR CALCULATING THE RISK-BASED PREMIUM OF INDIVIDUAL CREDIT
INSTITUTIONS**
(Official Gazette of Montenegro 129/20, 070/23)

I. BASIC PROVISIONS

Subject Matter

Article 1

This methodology specified the method of calculating the risk profile of the credit institutions in the deposit protection system in Montenegro for the purpose of calculating the risk-based deposit protection premium of individual credit institutions, members of the deposit protection system.

The methodology sets out the objectives and principles followed by the Deposit Protection Fund (hereinafter: the Fund) in the calculation of the risk-based premium.

Definitions

Article 2

The terms used in this methodology shall have the following meaning:

- 1) **Deposit protection premium** is the premium that a credit institution is obliged to pay for deposit protection and which is based on the amount of guaranteed deposits and the risk profile of the credit institution. The Fund calculates and collects regular premiums and extraordinary premiums in accordance with this methodology.
 - 2) **Premium base** is the average amount of guaranteed deposits of a credit institution in the previous quarter, which is calculated as the average as at the last day in each month in the relevant quarter.
 - 3) **Premium rate** is the rate of 1.2% per annum that is applied quarterly to the premium base in the amount of $\frac{1}{4}$ or 0.30%.
 - 4) **Risk categories** for which individual risk indicators are determined are: capital, liquidity and funding sources, asset quality, business model and governance, potential loss for the Fund.
 - 5) **Individual risk indicator** means the primary risk measure in a particular risk category of a credit institution transformed from the original values of the risk indicators per the limit values that ensure its range from 0 to 100.
 - 6) **Cumulative risk assessment for a credit institution** is the sum of all assessments of individual risk indicators, multiplied by the appropriate risk ratio.
 - 7) **Risk profile - the cumulative risk ratio** is a measure of risk of an individual credit institution assessed by the functional transformation of the cumulative risk assessment for an individual credit institution, expressed via the risk class.
 - 8) **Adjustment coefficient (μ)** is an additional technical parameter that enables the Fund to ensure that its funds reach the target amount.
 - 9) **Target amount** is the amount of funds that the Fund has to reach over a certain period of time, i.e. during the accumulation phase.
 - 10) **Annual target amount** is the amount of premiums that the Fund has to collect from the member institutions in the accounting year.
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- 11) **Risk class** is a measure of risk from level 1 (very low-risk credit institution) to level 7 (highly risky credit institution).

Other terms used in this methodology shall have the meanings specified in the Deposit Protection Law (hereinafter: the Law).

II. METHODOLOGY OBJECTIVES AND PRINCIPLES

Objectives

Article 3

The objectives ensure that:

- 1) the cost of financing the Fund, i.e. the deposit protection system in Montenegro, is borne by the credit institutions themselves and that their contributions are proportional to the obligations of the Fund;
- 2) the minimum target amount of 10% of guaranteed deposits has been reached;
- 3) the diminishing of the impact of excessive risk taking by a member credit institution is accomplished by collecting higher deposit protection premiums from riskier credit institutions.

Principles

Article 4

The methodology is based on the following principles:

- 1) The calculation method reflects the Fund's exposure as a result of the risk profile of the member credit institution, the possibility of a protected event in the credit institution or the use of the Fund's resources for recovery of the credit institution, and a possible net loss arising from the Fund's intervention and after the compensation from the bankruptcy pool of the credit institution.
 - 2) The calculation method aims at achieving the target amount of at least 10% of guaranteed deposits specified in the Law by distributing the deposit protection premium as evenly as possible over time until the target amount has been reached, taking into account the business cycle phase and the procyclical impact that the deposit protection premium may have on the financial position of member credit institutions.
 - 3) The financing of the Fund is harmonized with the prudential requirements applicable to credit institutions in Montenegro, i.e. with the capital and liquidity requirements that reflect the risk of individual member credit institutions in order to reduce moral hazard, with the premium calculation method was developed and calibrated using statistical and econometric tools.
 - 4) The calculation method takes into account the specific characteristics of the banking system in Montenegro and it is harmonized with the regulatory framework and accounting and reporting practices in Montenegro, and the risk indicators selected for the calculation method enable the Fund to adequately identify differences in credit institutions' risk levels by taking into account their business model and exposure to the Fund (possible losses for the Fund).
 - 5) The rules for calculating the deposit protection premium are objective and transparent and apply equally to all credit institutions that are members of the deposit protection system in Montenegro.
 - 6) The Fund uses for calculation monthly reports submitted by credit institutions to the Fund and data submitted by the Central Bank of Montenegro (hereinafter: the Central Bank) on the basis of audited reports of credit institutions for the previous year. The collection of
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data necessary for the calculation of the risk profiles of credit institutions for the purposes of calculating deposit protection premiums does not lead to additional reporting requirements for credit institutions.

- 7) Data on operations of a credit institution used by the Fund for the calculation of the deposit protection premium and which are not publicly disclosed are confidential, and the results of risk classification and its elements of the credit institution are provided only to that credit institution.
- 8) Alignment of the calculation method with relevant historical data on credit institutions for the purpose of calculating average values of individual risk categories in the overall banking system and recalibration of the calculation method parameters.

III. CALCULATION OF RISK PROFILE OF INDIVIDUAL CREDIT INSTITUTIONS

Key elements for determining risk profile

Article 5

The selection of risk indicators is in line with best risk management practices and existing prudential requirements.

The key elements for calculating risk profile of an individual credit institution for the purpose of calculating the risk-based premium include:

- 1) Risk categories, key risk indicators and associated risk ratios;
- 2) Assessment of individual risk indicators, and
- 3) Assigning cumulative risk ratio to individual credit institutions.

Risk indicator categories

Article 6

The calculation of the cumulative risk assessment of an individual credit institution is based on a number of key risk indicators from each of the following risk categories:

- 1) Capital
- 2) Liquidity and funding sources
- 3) Asset quality
- 4) Business model and governance
- 5) Potential losses for the Fund

Risk categories, key risk indicators and associated risk ratios are applied as follows:

<i>Risk categories and key risk indicator</i>		Risk ratio (RR)	Calculation of key risk indicators	Description
1		2	3	4
1.	Capital	24 %		
1.1	Leverage ratio (LEV)	12 %	Tier 1 capital / total exposure	Higher value means lower risk (-)
1.2	Total capital adequacy ratio (TCR)	12 %	Own funds / total risk exposure amount	Higher value means lower risk (-)
2.	Liquidity and funding	24 %		

2.1	Liquidity coverage ratio (LCR) ¹	12 %	Liquidity buffer / net liquidity outflows	Higher value means lower risk (-)
2.2	Average ten-day liquidity for month XII ²	12 %	First + second + third Ten-day liquidity for month XII / 3	Higher value means lower risk (-)
3.	Asset quality	22%		
3.1	NPL ratio	13 %	gross C, D and E loans and receivables minus accruals and advances and interest / total gross loans and receivables minus accruals and interest	Higher value means lower risk (+)
3.2	NPL / total value adjustment coverage	9%	Total value adjustments for loans and receivables / C, D and E loans and receivables	Higher value means lower risk (-)
4	Business model and governance	13 %		
4.1	Risk density	6.5 %	Risk-weighted assets (RWA) / total assets	Higher value means higher risk (+)
4.2	Return on average assets	6.5%	Net profit / (total assets T0 + total assets T-1) / 2	Lower (and negative) value means higher risk (+)
5	Potential losses for the Fund	17 %		
5.1	Potential losses for the Fund	17 %	Guaranteed deposits / unencumbered assets	Higher value means higher risk (+)
Total		100 %		

Assessment of individual risk indicators

Article 7

For each credit institution that is a member of the deposit protection system, the assessment of individual risk indicators is calculated for each risk indicator. Each risk indicator has an established average value at the level of the Montenegrin banking system (risk level 50) and assigned lower and upper limits.

The limits are determined in a way that reflects both the current situation and trends present in the banking system, while respecting the macroeconomic environment and business logic regardless of historical data.

When a higher value of a risk indicator indicates a riskier institution and the risk indicator is above the upper limit, the rating of an individual risk indicator will be a fixed value of 100. Similarly, when the value of a risk indicator is lower than the lower limit, the rating of an individual risk indicator will be 0.

If a lower risk indicator indicates a riskier institution and the risk indicator is below the lower limit, the rating of the individual risk indicator will be a fixed value of 100. Therefore, when the value of the risk indicator is above the upper limit, the rating of the individual risk indicator will be 0.

¹ This indicator will be replaced once the LCR indicator has become available.

² This indicator will be replaced once the NSFR indicator has become available.

The sign of the risk indicator defined in column 4 of the table from Article 6 paragraph 2 hereof indicates whether a higher value of the risk indicator means a higher risk or vice versa.

If the value of the risk indicator is between the established limits, the assessment of the individual risk indicator will range between 0 and 100. Each assessment of the individual risk indicator has a predetermined risk ratio defined in column 2 of the aforesaid table.

To assess the individual risk indicator with each key risk indicator in the accounting year, the average value at the level of the Montenegrin banking system for the previous year or two consecutive business years is determined and the lower and upper limits are then calibrated.

When the regulation does not establish the lower limit of an individual risk indicator, the lower limit is set at 20% of the average value at the system level, while the upper limit is set at the level of the average value increased by 80%. In this way, the limits (since the average is used as an assessment of individual risk = 50) are automatically adjusted to changes in the way the banking system operates, and also include a sufficient number of credit institutions within the limits. An example of calculating the lower and upper limits when the regulation does not establish a lower limit is given in Annex 1 of this methodology and forms an integral part thereof.

When the regulation establishes a lower limit of an individual risk - minimum (lower limit of e.g. solvency and ten-day liquidity average), then such a minimum is used as the lower limit, and the upper limit is determined as twice the average value of an individual indicator reduced by the prescribed minimum. An example of calculating the lower and upper limits when the regulation establishes the lower limit of individual risk is given in Annex 2 of this methodology and forms an integral part thereof.

Overview of the described model:

Risk indicator	Risk ratio	Lower limit	Banking system average	Upper limit	Individual risk assessment
Indicator 1	KR1	a1	b1	c1	OPR1
Indicator 2	KR2	a2	b2	c2	OPR2
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Indicator n	KRN	An	Bn	cn	OPRn

Cumulative risk assessment for an individual credit institution

Article 8

After calculating all assessments of individual risk indicators for an individual credit institution, a cumulative risk assessment of that individual credit institution is then calculated.

The cumulative risk assessment of an individual credit institution is calculated by summing all risk assessments of individual indicators adjusted for the relevant risk indicator ratios.

An example of the cumulative risk assessment of a credit institution is given in Annex 3 of this methodology and forms an integral part thereof.

Thresholds for assigning cumulative risk assessment – risk profile

Article 9

Cumulative risk ratio – risk profile shows the differences in risks borne by individual member credit institutions.

The methodology establishes the lowest aggregate risk ratio of 75%, the highest aggregate risk ratio of 150%, and the aggregate risk thresholds.

The cumulative risk ratio is assigned to member credit institutions based on the value of the aggregate risk assessment for seven risk categories - risk classes, with the cumulative risk ratios (75%, 90%, 100%, 110%, 130%, and 150%) assigned to each risk class as follows:

Risk class	Cumulative risk assessment thresholds	Cumulative risk ratio – risk profile
1	≤30	75%
2	>30 ≤40	90%
3	>40 ≤50	100%
4	>50 ≤60	110%
5	>60 ≤70	120%
6	>70 ≤80	130%
7	>80 ≤100	150%

Risk calculation data

Article 10

The Fund receives data for calculating the risk profile of an individual credit institution from the Central Bank and credit institutions

The Fund uses the following to calculate the value of a risk indicator for an accounting year:

- value at the end of the previous business year from the audited financial statements and / or
- the average value at the end of two consecutive business years, and
- the average value for the previous business year at of the banking system level.

IV. PREMIUM CALCULATION

Regular premium formula calculation

Article 11

The regular premium is calculated using the following formula:

$$RP-ki = PS * SR-ki * GD-ki * \mu$$

Where:

1. **RP-ki** is the regular premium of the credit institution
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2. **PS** is the premium rate
3. **SR-ki** is the risk profile of the credit institution
4. **GD-ki** is the guaranteed deposits of the credit institution (premium base)
5. **μ** is the adjustment coefficient

The premium rate is the same for all credit institutions and it amounts to 1.20% at the annual level, with ¼ of the rate or 0.30% quarterly used for the calculation.

Risk profile of a credit institution is disclosed through risk classes and it is calculated as the sum of calculated values of individual risk indicators in accordance with Article 7 of this Methodology.

Guaranteed deposits of a credit institution form the premium base for the regular premium calculation with an average amount of guaranteed deposits in the previous quarter, calculated as an average on the last day of each quarter, being used for the premium calculation.

The adjustment coefficient is used to align the sum of unadjusted quarterly premiums of all credit institutions in order to reach the annual target amount so that total premiums would not be too high or too low.

The adjustment coefficient is calculated using the following formula:

$$\mu = \text{annual target amount} / \text{sum of unadjusted annual premiums}$$

Annual target amount

Article 12

The initial target amount of at least 10% of the total guaranteed deposits of all credit institution members of the deposit protection system is the amount that the Fund plans to collect in the initial accumulation phase by 31 December 2024.

The establishing of the annual target amount is done by dividing the difference between the estimated target amount on 31 December of the last year of the accumulation phase and the estimated amount of the Fund's assets on 31 December of the current year by the number of remaining years until the end of the accumulation phase.

The annual target amount is specified in the decision on the total regular premium for all member credit institutions until 31st October of the current year for the following year.

When the Fund's assets reach the target amount, the annual target amount is determined on the basis of the planned growth of guaranteed deposits and the planned operating costs of the Fund for the year for which the annual target amount is being determined.

During the accumulation phase, the regular premium is distributed as evenly as possible until the target amount of the Fund's resources has been reached.

Should the Fund's resources reduce to less than 6% of the total guaranteed deposits of all credit institutions after reaching the minimum amount of 10% of total guaranteed deposits of all credit institutions, a new accumulation phase is to be specified in accordance with Article 37 paragraph 3 of the Law.

The new accumulation phase shall begin after the year in which the target amount declined and the annual target amount, i.e. the regular premium amount will be determined in such a way that the minimum target level can be reached within six years.

The Fund may increase or decrease the annual target amount to reflect developments in the business cycle and the procyclical impact on the level of financial burden of the Fund members.

Steps to calculate the regular premium

Article 13

Advance calculation of the first and second instalment of the regular premium for an accounting year is performed on the basis of the determined risk profile of an individual credit institution for the previous year;

Calculation of the value of all risk indicators, calculation of the cumulative risk assessment and assigning risk profile to each credit institution for the accounting year;

Adjustment of unadjusted quarterly premiums to the annual target amount.

Calculation of regular premium instalments

Article 14

Calculation of the first regular premium instalment – Q1 of an accounting year:

1. The average amount of guaranteed deposits in the fourth quarter of the previous year and the risk profile determined for the previous year are used for the premium base;

Calculation of the second regular premium instalment – Q2 of an accounting year:

1. The average amount of guaranteed deposits in the first quarter of the current accounting year and the risk profile determined for the previous year are used for the premium base;

Calculation of the third regular premium instalment – Q3 of an accounting year:

1. The average amount of guaranteed deposits in the second quarter of the current accounting year and the risk profile determined for the accounting year is used for the premium base;
2. Should there be a difference between the risk profile in the accounting year in relation to the risk profile for the previous year, when calculating the third instalment of the regular premium, the Fund will calculate the difference in premium and show it on invoices for the third instalment of the regular premium ("+" or "-"). The credit institution shall pay the calculated positive difference between the advance calculation of the first and second instalment of the regular premium together with the payment of the third instalment of the regular premium. The fund will reduce the difference arising from improved risk profile on the invoice for the third instalment of the regular premium.

Calculation of the fourth regular premium instalment – Q4 of an accounting year:

1. The average amount of guaranteed deposits in the third quarter of the current accounting year and the risk profile determined for the accounting year are used for the premium base.

New credit institutions

Article 15

The risk ratio of 110% and/or risk class 4 shall be used for the calculation of the premium for a newly established credit institution and it is to be applied until the end of the third full year from the commencement of business of the credit institution.

Credit institution under interim administration

Article 16

During the period following the introduction of the interim administration, a credit institution shall pay the regular premium at a cumulative risk ratio of 150% and/or risk class 7, regardless of the previously established risk class.

Extraordinary premium

Article 17

Should the circumstances specified in Article 38 paragraph 1 of the Law arise, the Managing Board of the Fund shall make a decision on the introduction of an extraordinary premium.

The calculation of the extraordinary premium shall be performed in accordance with this methodology, i.e. on the basis of risk profile of an individual credit institution.

V. TRANSITIONAL AND FINAL PROVISIONS

Article 18

For the purpose calculating the first and second instalment of the regular premium for 2021, the Central Bank will submit to the Fund data for calculating the risk profile of individual credit institutions, based on the submitted audited reports for the business year 2019, no later than by 15 January 2021.

Entry into force

Article 19

This methodology shall enter into force on the day of its publishing in the Official Gazette of Montenegro.

Establishing lower and upper limits when the regulation does not specify the lower limit

Example for NPLs:

The following formula is used for establishing the lower limit:

$$\mathbf{Dg = 20\% Pv,}$$

Where **Dg** is the lower limit and **Pv** is the average value of the ratio at the banking system level.

The average value of NPLs in member credit institutions stood at 5.71% at the end of 2022. This value represents the assessment of the average risk indicator = 50.

The lower limit is determined as 20% of the average value of NPLs = 1.142%. For this value and all values below the lower limit, the score of the individual risk indicator is 0.

The following formula is used for establishing the upper limit:

$$\mathbf{Gg= Pv + 80\%Pv}$$

Where **Gg** is the upper limit and **Pv** is the average value of the ratio at the banking system level.

The upper limit is determined as the average value + 80% of the average value = 10.278%. For this value and all values above the upper limit, the score of the individual indicator is = 100.

All individual ratios that are in the range of 1.142 – 10.278 receive an appropriate rating - risk weight in the range of 0 - 100. Thus, we obtain an assessment of the individual risk indicator.

In order to determine the cumulative assessment of this risk, the obtained assessment of an individual risk indicator is multiplied by the corresponding coefficient - weight, defined by the share of 13% in the total risk ratio of 100% (table from Article 6 column 2 hereof).

The assessment of an individual risk indicator for an average risk ratio of 5.71% is 50, and the cumulative risk assessment (its share in overall risk) is $50 \times 13\% = 6.50$.

Risk limits and cumulative risk assessment for all other risk categories are determined in the same fashion.

Establishing lower and upper limits when the regulation specifies the lower limit of individual risk

Example for total capital adequacy ratio:

The limits are calculated on the basis of the following formula:

Lower limit:

$Dg = \min$

Where **Dg** is the lower limit and **min** is prescribed by the Central Bank.

Establishing the upper limit:

$Gd = 2 \times Pv - \min$

Where **Dg** is the lower limit and **Pv** is the average value of the ratio at the banking system level.

The average 2022 total capital adequacy ratio at the system level is 19.32%. This value represents the assessment of the average risk indicator = 50.

The lower limit is prescribed under the Central Bank regulation and it amounts to 8.00%. The score of the individual risk indicator for this and all values below the lower limit is 100.

Upper limit = $2 \times 19.32 - 8 = 38.64 - 8 = 30.64\%$. The score of the individual risk indicator for this and all values below the lower limit is 0.

All individual ratios that are in the range of 8.00 – 30.64 receive an appropriate risk rating in the range of 0 - 100. Thus, we obtain an assessment of the individual risk indicator.

In order to determine the cumulative assessment of this risk, the obtained assessment of an individual risk indicator is multiplied by the corresponding coefficient - weight, defined by the share of 12% in the total risk ratio of 100% (table from Article 6 column 2 hereof).

The assessment of an individual risk indicator for an average risk ratio of 19.32% is 50, and the cumulative risk assessment (its share in overall risk) is $50 \times 12\% = 6.00$.

Establishing cumulative risk assessment (example)

Baseline assumption: All risk indicators are system-level averages.

Risk category	Key risk indicator	Risk indicator assessment	Risk ratio	Cumulative risk assessment
1.1. Leverage ratio (LEV)	7.95 %	50.00	12.0 %	6.00
1.2. Total capital adequacy ratio (TCR)	19.32 %	50.00	12.0 %	6.00
2.1. Liquidity coverage ratio (LCR)	317.69 %	50.00	12.0 %	6.00
2.2. Average ten-day liquidity for month XII	2.23 %	50.00	12.0 %	6.00
3.1. NPL ratio	5.71 %	50.00	13.0 %	6.15
3.2. NPL / total value adjustment coverage	69.36 %	50.00	9.0 %	4.50
4.1. Risk density	39.57 %	50.00	6.5 %	3.25
4.2. Return on average assets	1.45 %	50.00	6.5 %	3.25
5.1. Potential losses for the Fund	30.47 %	50.00	17.0%	8.50
Cumulative risk ratio				50.00
Risk class				3

Based on the cumulative risk assessment, the cumulative risk ratio for the relevant credit institution is 50. For this cumulative risk ratio 50, the credit institution is assigned risk class 3 and pays the risk-based premium of 100% (average risk), in accordance with Article 9 paragraph 3 of the methodology.