KASE CLEARING CENTER JSC

M E T H O D O L O G Y
for calculation of sizes of clearing funds

Almaty City

2023

This Methodology for calculation and evaluation of sizes of clearing funds (hereinafter referred to as the Methodology) has been developed subject to the Securities Market Law of the Republic of Kazakhstan, Rules for Clearing Activities under Transactions with Financial Instruments, Requirements for risk management system of a clearing organization, terms and conditions and monitoring procedures, control and management of risks in a clearing organization, Requirements for the central counterparty risk management system, terms and conditions and procedure for monitoring, control and management of risks of the central counterparty and internal document of KASE Clearing Center JSC (hereinafter referred to as the Clearing Center) Rules for clearing activities under transactions with financial instruments (hereinafter referred to as the Clearing Rules) and it shall establish the procedure for calculation and evaluation of sizes of clearing reserve or guarantee funds of the central counterparty.

Chapter 1. GENERAL PROVISIONS

1. The Methodology shall use concepts defined by regulatory legal acts of the Republic of Kazakhstan, Clearing Rules and other internal documents of the Clearing Center.

2. The methodology shall be used to calculate and evaluate sufficiency of sizes of the clearing funds formed on the markets on which the Clearing Center carries out clearing activities (hereinafter referred to as the clearing funds), with the exception of guarantee funds of the property pool, procedure for calculation and evaluation which is approved by the Clearing Rules and the internal document of the Clearing Center "Instructions for issue, placement, circulation and redemption of clearing participation certificates."

3. Calculation and evaluation of sufficiency of a size of the clearing funds shall be carried out annually as of January 1 of the year following the reporting one (hereinafter referred to as the reporting date), no later than a calendar month from the reporting date for a historical sampling period to evaluate sufficiency of the clearing funds.

4. As part of calculation and evaluation of sufficiency of sizes of the clearing funds, the following shall be carried out:

   1) identification of the most significant risk factors affecting the ability of the Clearing Center to discharge its obligations as the central counterparty;

   2) evaluation of sufficiency of the clearing guarantee funds formed from contributions of the clearing participants for each individual exchange market – stock market, foreign exchange market and derivatives market, corresponding to the concepts defined by the Clearing Rules;

   3) evaluation of sufficiency of the clearing reserve funds formed at the expense of own funds of the Clearing Center.

5. Determination of the most significant risk factors affecting the ability of the Clearing Center to discharge its obligations as the central counterparty shall be carried out subject to chapter 2 of the Methodology.

6. Evaluation of sufficiency of sizes of the clearing funds shall be carried out subject to chapter 4 of the Methodology.

7. Based on results of evaluation of sufficiency of sizes of the clearing funds, the Clearing Center can decide to introduce measures designed to mange risks of the Clearing Center, and including but not limited to the following:

   1) increase in requirements to the amount of margin security for clearing participants and/or the method for calculation of the amount of margin security for clearing participants;

   2) increase in size of reserve funds and/or revision of approaches to calculation of the size of the reserve funds on one or more markets;

   3) increase in amount of contributions to guarantee funds and/or revision of approaches to calculation of the amount of contributions to guarantee funds;

   4) other measures designed to mitigate risks of the Clearing Center

8. The Clearing Center shall have the right to make an unscheduled evaluation of sufficiency of sizes

of the clearing funds based on a decision of the Management Board of the Clearing Center made based on a recommendation of the Market Risk Committee of the Clearing Center (hereinafter referred to as the Committee) in the following cases:

1) with a significant increase in price volatility and/or decrease in liquidity of instruments that are the subject of obligations under transactions closed with participation of the central counterparty;

2) with a significant increase in concentration of net positions of the clearing participants;

3) in other cases on the basis of a separate decision of the Management Board of the Clearing Center.

9.   Criteria for significance of an increase in price volatility and/or a decrease in liquidity of instruments that are the subject of obligations under transactions closed with participation of the central counterparty, and/or an increase in concentration of net positions of the clearing participants, set out in clause 8 of the Methodology, shall be established based on a decision of the Committee.

10. Formation of a sampling for an unscheduled evaluation of sufficiency of sizes of the clearing funds in case of occurrence of events defined in sub-clauses 1) and 2) clause 8 of the Methodology shall be carried out as of the date following the date of occurrence of the specified conditions, evaluation of sufficiency of the clearing funds shall be carried out no later than one calendar month from the date of the decision by the Clearing Center Board on an unscheduled evaluation of sufficiency.

11. Unscheduled evaluation of sufficiency of sizes of the clearing funds in case of events set out in sub-clause 3) clause 8 of the Methodology shall be carried out as of the date set out in a separate decision of the Management Board of the Clearing Center.

12. Unscheduled evaluation of sufficiency of sizes of the clearing funds shall be carried out regardless of a period of the previous evaluation of sufficiency of the clearing funds and shall not cancel the next regular evaluation.

13. In order to calculate parameters necessary to evaluate sizes of the clearing funds (hereinafter referred to as statistical parameters), the Clearing Center shall use information about risk parameters established on the exchange markets, transactions closed by the clearing participants, available collateral on accounts of the clearing participants as well as audited reporting of the Clearing Center as of the first day of the year following the reporting period.

14. Basic fundamental parameters used to evaluate statistical parameters when evaluating the sufficiency sufficiency of the clearing funds shall be:

1) reporting period equal to one calendar year;

2) historical period for evaluation of extreme conditions on each exchange market is equal to ten years;

3) level of confidence equal to at least 99%;

15. The Committee can establish fundamental parameters different from the basic fundamental parameters but not less than those established in clause 14 of the Methodology.

16. In the absence of the necessary data for the period under review, the Clearing Center shall have the right to evaluate sizes of the clearing funds based on other available data with similar parameters.

17. Values to be calculated shall be rounded according to the rules of mathematical rounding (digits up to five shall be reduced to zero, and digits from five and above shall be increased to ten) with precision:

1) statistical parameters: up to two decimal places;

2) amount of additional contributions of the clearing participants to guarantee funds, as well as the amount of additional contributions of the Clearing Center to reserve funds: up to 500 thousand tenge.

Chapter 2. IDENTIFYING THE MOST SIGNIFICANT RISK FACTORS

18. Market risk factors that have a significant impact on the ability of the Clearing Center to discharge its obligations as a central counterparty (hereinafter referred to as risk factors) shall be changes in settlement prices of financial instruments.

19. Identification of risk factors shall be carried out in the context of groups of financial instruments of each individual exchange market based on historical data:

    1) during a next revision as of January 1 of the year following the reporting one;

    2) during an unscheduled review as of the date set out in a separate decision of the Management Board of the Clearing Center.

20. Risk factors shall be identified taking into account the following approaches:

    1) in order to determine historical scenarios, data on values of risk factors for the historical period established by the Committee for evaluation of extreme conditions on each exchange market is used;

    2) when determining historical scenarios, events for historical period of evaluation of extreme conditions that are unrealistic taking into account the economic situation on the date of evaluation of sufficiency of the clearing funds are indicated;

    3) hypothetical scenarios are determined based on historical scenarios as a set of individual factors, not necessarily interrelated, that took place during the historical period of evaluation of extreme conditions, as well as taking into account other information about possible changes in risk factors in extreme conditions;

    4) in order to generate scenarios, changes in values of risk factors are determined as a result of changes in market conditions expected within the risk evaluation horizons established to determine market risk rates subject to the Methodology for determining risk parameters;

    5) to identify an acceptable set of realistic scenarios, maximum ranges of hypothetical scenarios are determined taking into account the risk evaluation horizons;

    6) in order to determine risk factors, all financial instruments are distributed into groups subject to the following conditions:

        – financial instruments with different quotation currencies of a financial instrument belong to different groups;

        – financial instruments belonging to different groups, sensitive to changes in interest rates, are not combined into one group with other financial instruments that are not sensitive to changes in interest rates;

        – in terms of foreign currencies.

    7) distribution of financial instruments by issuer and the following types is used as groups of financial instruments:

        – government securities of the Republic of Kazakhstan (hereinafter referred to as the government securities) – debt securities issued by the Ministry of Finance of the Republic of Kazakhstan, the National Bank of the Republic of Kazakhstan or local executive bodies that were included in the official list of the Exchange for the analyzed period;

        – debt securities issued by international financial organizations (hereinafter referred to as the securities of MFO);

        – non-government securities (hereinafter referred to as non-government securities) – securities (with the exception of securities of MFO) issued by issuers of the Republic of Kazakhstan, included in the official list of the Exchange for which trading was opened in the analyzed period.

21. In the process of determining risk factors based on basic fundamental parameters or on the basis of fundamental parameters established by the Committee, if the Committee makes a relevant decision, samplings shall be formed for each individual financial instrument:

    1) relative changes in settlement prices of financial instruments between trading days T – (T-1),

and T – (T-2) using the formula:

$$\Delta P_T = \max \left\{ \left| \frac{P_T - P_{T-1}}{P_{T-1}} \right| ; \left| \frac{P_T - P_{T-2}}{P_{T-2}} \right| \right\},$$

where:

ΔP_T — values of a sampling to be generated – absolute change in settlement price on trading day T from settlement price on trading day T-1 and settlement price on trading day T-2 in fractional terms;

max — mathematical function that calculates the largest of the specified in parentheses values;

P_T — settlement price on trading day T;

P_{T-1} — settlement price on trading day T-1;

P_{T-2} — settlement price on trading day T-2;

2) absolute changes in settlement prices in the form of yields using the formula:

$$\Delta P_T^* = \max \left\{ \left| P_T^* - P_{T-1}^* \right| ; \left| P_T^* - P_{T-2}^* \right| \right\},$$

where:

ΔP_T^* — values of a sampling to be generated – relative change in settlement price in form of yields on trading day T from settlement price on trading day T-1 and settlement price on trading day T-2 in fractional expression;

max — mathematical function that calculates the largest of the values indicated in brackets;

P_T^* — settlement price on trading day T;

P_{T-1}^* — settlement price on trading day T-1;

P_{T-2}^* — settlement price on trading day T-2.

22. Based on samplings obtained subject to clause 21 of the Methodology, the largest changes in settlement prices ΔP_{max} among financial instruments of one group shall be determined for each individual group of financial instruments for the historical period of evaluation of extreme conditions, on the basis of which scenarios of possible changes in risk factors shall be formed.

23. For each exchange market, based on an analysis of historical and hypothetical changes (scenarios) of one or more of the risk factors, the Clearing Center shall determine the most probable and significant scenarios that will be used to evaluate sufficiency of sizes of the clearing funds.

24. Scenarios used during a scheduled or an unscheduled evaluation of sufficiency of sizes of the clearing funds shall be approved by a decision of the Committee.

Chapter 3. CALCULATION OF MAXIMUM DAILY LOSSES OF THE CLEARING PARTICIPANTS

25. Based on results of each settlement day T for the reporting period, for each clearing participant k in the "partially collateralized" category of a certain exchange market, total amounts of potential uncovered losses shall be calculated in implementation of scenarios of changes in risk factors ΔP_{max} (hereinafter referred to as ΔP_{max} scenarios) generated subject to chapter 2 of the Methodology, for all open positions and all financial instruments on all trading and clearing accounts subject to the following procedure:

1) for each trading and clearing account, amount of potential losses when implementing scenarios ΔP_{max} is calculated using the formula:

$$\text{Loss}_{T,k,j} = (\Delta P_{max, \text{FI1}} * \text{abs} \left(\text{OΠ}_{\text{FI1},k,j} \right) + \Delta P_{max, \text{FI2}} * \text{abs} \left(\text{OΠ}_{\text{FI2},k,j} \right) + \ldots + \Delta P_{max, \text{FIm1}} * \text{abs} \left(\text{OΠ}_{\text{FIm1},k,j} \right)$$

where:

abs — mathematical function that calculates modulus of the numbers specified in brackets;

$ОП_{ФИ,k,j}$ — amount of an open net position for the k-th clearing participant for all claims and obligations for a financial instrument of the same type for the j-th trading and clearing account, resulting from transactions with a financial instrument of the same type as of the end of trading day T made by the clearing participant;

$\Delta P_{max, FI}$ — change in value of a financial instrument during implementation of a scenario formed subject to chapter 2 of this Methodology for the group that includes the specified financial instrument;

K — serial number of the clearing participant;

J — number of the trading and clearing account for which there are open net positions on settlement day T.

2) for each trading and clearing account, amount of the collateral provided during implementation of scenarios ΔP_{max}, expressed in KZT, is calculated using the formula::

$$O_{T,k,j,\Delta P_{max}}=(1-\Delta P_{max, FI1}) \times O_{Fi1,k,j}+(1-\Delta P_{max, FI2}) \times O_{FI2,k,j}+...+(1-\Delta P_{max, FIm2}) \times O_{FIm2,k,j},$$

where:

$O_{FI,k,j}$ — amount of collateral contributed by the k-th clearing participant in a financial instrument of the same type on the j-th trading and clearing account of the specified clearing participant as of the end of trading day T;

3) for each trading and clearing account, the amount of potential uncovered losses when implementing scenarios ΔP_{max} is calculated using the formula:

$$ULoss_{T,k,j}=\begin{cases} 0, \text{ if } O_{T,k,\Delta P_{max}}\text{-}Loss_{T,k,j}\geq 0 \\ O_{T,k,\Delta P_{max}}\text{-}Loss_{T,k,j}, \text{ if } O_{T,k,\Delta P_{max}}\text{-}Loss_{T,k,j}<0 \end{cases}$$

4) for each clearing participant for all its trading and clearing accounts, the total amount of potential uncovered losses in implementation of scenarios P_{max} is calculated based on results of trading day T using the formula:

$$ULoss_{T,k} = ULoss_{T,k,j1} + ULoss_{T,k,j2}+...+ULoss_{T,k,jl}.$$

26. For each clearing participant k in the category "with partial collateralization" of a certain exchange market, maximum total amount of potential uncovered losses in the implementation of scenarios $\Delta Pmax$ for the reporting period shall be calculated using the formula:

$$ULoss_{max,k}=\max\left(ULoss_{T1,k};ULoss_{T2,k};...;ULoss_{Tf,k}\right),$$

where:

max — mathematical function that calculates a maximum value of a number sequence.

27. Amount of maximum losses of N clearing participants shall be calculated according to the following algorithm:

1) for the entire sampling of the clearing participants in the category "with partial collateralization", the N of clearing participants with the largest values of the maximum total amount of potential uncovered losses when implementing scenarios $\Delta Pmax$ for the reporting period is calculated;

2) sum of maximum losses of N clearing participants is calculated as a sum of the largest values of a maximum total amount of potential uncovered losses for the specified clearing participants in implementation of scenarios $\Delta Pmax$:

$$ULossN_{max} = ULoss_{max,k1} + ULoss_{max,k2}+...+ULoss_{max,kN},$$

where:

N — number of participants with the largest losses on the market under study. In order to evaluate sufficiency of the clearing funds, this parameter is set by default to two. For additional analysis, a different value of the specified

parameter can be set depending on the purposes of the analysis.

Chapter 4. CALCULATION OF SUFFICIENCY INDICATORS OF THE CLEARING FUNDS

28. In order to evaluate sufficiency of the clearing funds, the Clearing Center shall, based on scenarios determined subject to chapter 2 of the Methodology, calculate the following main indicators:

    1) loss coverage ratio of the clearing funds for individual exchange markets;

    2) sufficiency ratio of guarantee funds for individual exchange markets;

    3) reserve fund sufficiency ratio for individual exchange markets.

29. Main indicators provided for in clause 28 of the Methodology shall be calculated according to the following formulas:

    1) loss ratio of the clearing funds on a separate exchange market:

$$K_{loss} = \frac{ULossN_{max}}{GF + RF},$$

    2) sufficiency ratio of the clearing guarantee fund on a separate exchange market:

$$K_{GF} = \frac{GF}{ULossN_{max}},$$

    3) sufficiency ratio of the clearing reserve fund on a separate exchange market:

$$K_{RF} = \frac{RF}{ULossN_{max}},$$

    where:

    $ULossN_{max}$ – sum of maximum losses of N clearing participants on a separate exchange market;

    GF – clearing guarantee fund on a separate exchange market, formed as of the reporting date;

    RF – clearing reserve fund on a separate exchange market, formed as of the reporting date.

30. As of the reporting date, clearing funds formed on a separate exchange market shall be considered sufficient provided that the loss ratio of the clearing funds on the specified exchange market does not exceed 1 (one).

31. If, as of the reporting date, the loss coverage ratio of the clearing funds on a separate exchange market exceeds the value of 1 (one):

    1) amount of formed clearing funds on a separate exchange market as of the reporting date is recognized as insufficient;

    2) replenishment of the clearing funds is required from one or more of the following sources:

        – additional contributions of the clearing participants to the guarantee fund of the specified exchange market;

        – replenishment of the reserve fund of the specified exchange market at the expense of own funds of the Clearing Center.

32. In order to determine sources of replenishment of the clearing funds, sufficiency ratio of guarantee funds and sufficiency ratio of reserve funds for the specified exchange market shall be calculated.

33. Required values of sufficiency ratio of guarantee funds and of sufficiency ratio of reserve funds for a separate exchange market shall be calculated based on shares of guarantee and reserve funds in the total clearing funds on the specified exchange market established by the Management Board of the Clearing Center according to the following formulas:

$$w_{GF} = 1 - w_{market_i},$$

$$w_{RF} = w_{Market_i},$$

where:

w_{Market_i} –   share of the reserve fund in the total clearing funds on the specified exchange market is established based on a decision of the Management Board in the range from 0.08 to 0.5;

34. Amount of generated guarantee funds on a particular exchange market shall be considered sufficient provided that sufficiency ratio of guarantee funds on the specified exchange market is not lower than the required value of sufficiency ratio of guarantee funds on the specified exchange market.

35. Need for clearing participants to make additional contributions into the guarantee fund of the specified exchange market shall arise if the required value of sufficiency ratio of the guarantee funds exceeds calculated value of the sufficiency ratio of the guarantee funds on the specified exchange market.

36. Amount of formed reserve funds on a particular exchange market shall be considered sufficient provided that sufficiency ratio of reserve funds on the specified exchange market is not lower than the required value of the sufficiency ratio of reserve funds on the specified exchange market.

37. Need to replenish the reserve fund of the specified exchange market at the expense of own funds of the Clearing Center shall arise if the required value of the reserve fund sufficiency ratio exceeds the calculated value of the reserve fund sufficiency ratio on the specified exchange market.

38. Amount of additional contributions of the clearing participants to the guarantee fund, as well as the amount of additional contribution by the Clearing Center of its own funds to the reserve fund shall be calculated subject to chapter 5 of this Methodology.

Chapter 5.   CALCULATION OF THE AMOUNT OF ADDITIONAL CONTRIBUTIONS TO CLEARING FUNDS

39. Amounts of additional contributions of the clearing participants required to be made by the clearing participants to the guarantee fund of a certain exchange market shall be calculated in the following sequence:

1) for each clearing participant k in the category "with partial collateralization" for the reporting period, the average daily amount of potential uncovered losses in implementation of scenarios ΔPmax, calculated subject to sub-clause 4) clause 25 of this Methodology, is calculated according to the formula:

$$ULoss_{avg,k} = \frac{(ULoss_{T1,k} + ULoss_{T2,k} + \ldots + ULoss_{Tf,k})}{T_F},$$

where T_F –   number of settlement days in the reporting period;

2) for each clearing participant k in the category "with partial collateralization", amount of the maximum additional contribution to the guarantee fund is calculated according to the formula:

$$AddMGV_k = \begin{cases} 0, \text{ if } ULoss_{avg,k} \leq GV_k \\ ULoss_{avg,k} - GV_k, \text{ if } ULoss_{avg,k} > GV_k \end{cases},$$

where

GV_k –   current amount of the guarantee contribution of the k-th clearing participant in the "with partial collateralization" category;

3) total amount of maximum additional contributions to the guarantee fund for all clearing participants is calculated according to the formula:

$$AddMGV = AddMGV_{k1} + AddMGV_{k2} + \ldots + AddMGV_{kn}$$

4) for each clearing participant k in the category "with partial collateralization", amount of the required additional contribution to the guarantee fund is calculated according to the formula:

$$AddGV_k = \begin{cases} \frac{AddMGV_k}{AddMGV} \times (w_{GF} \times ULossN_{max} - GF), \text{ if } (w_{GF} \times ULossN_{max} - GF) \leq AddMGV \\ AddMGV_k, \text{ if } (w_{GF} \times ULossN_{max} - GF) > AddMGV \end{cases}.$$

40. Amounts of additional contributions of the clearing participants required to be made to the guarantee fund of a certain exchange market may be adjusted based on a decision of the Management Board of the Clearing Center, taking into account the credit risk of the clearing participants.

41. Amount of the additional contribution of the Clearing Center to the reserve fund on a certain exchange market market$_j$ shall be calculated according the following formula:

$$AddGR_k = \begin{cases} (w_{RF} \times ULossN_{max} - RF)_{market_j} \\ min \left(\sum_{market_j} (w_{RF} \times ULossN_{max} - RF)_{market_j} ; NettoProfit \right) \end{cases}$$

where

min – mathematical function that calculates the smallest of the values specified in parentheses;

NettoProfit – net profit of the Clearing Center for the reporting period.

42. In order to determine sufficiency of the clearing funds, given the additional contributions to the guarantee and/or reserve funds, loss coverage ratio of the clearing funds shall be recalculated again, given the estimated values of the amounts to be replenished.

43. If the situation persists in which, despite the planned contributions of additional funds to the clearing funds, the loss ratio of the clearing funds on a separate exchange market will be less than 1 (one), the Management Board of the Clearing Center shall submit to the Board of Directors for study an offer to take measures designed to achieve the required indicator, including but not limited to the measures specified in clause 7 of the Methodology.

Chapter 6. FINAL PROVISIONS

44. Clearing subdivision of the Clearing Center shall be responsible for timely introduction of changes and additions to the Methodology.

45. The methodology shall be updated as necessary but at least once every three years.

Chairman of the Management Board   Sabitov I.M.