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RESOLUTION No. 5

"Risk management procedures in the Derivatives System and other related issues"

Codified to include the decisions dated 26.1.2015, 26.10.2015, 27.11.2017, 29.10.2018 and 26.11.2018 of the Board of Directors

THE BOARD OF DIRECTORS

OF ATHENS EXCHANGE CLEARING HOUSE S.A. (ATHEXClear)

(Meeting 109/17-11-2014)

Having regard to the provisions of § 2.4.12, § 3.2, § 5.2, § 5.3, § 6.1, § 6.2, § 6.4, § 6.4.1, § 6.4.2, § 7.7 and § 7.8.1 of Section II of the Rulebook for Clearing Derivatives Transactions (henceforth the "Rulebook")

HEREBY RESOLVES AS FOLLOWS

Article 1. Scope & Definitions

1.1 Scope

1. This Resolution sets out the risk management procedures of the Derivatives System in implementation of the Rulebook and other relevant issues.

2. In particular, the Resolution specifies the following matters:

a) Calculation of the Margin Requirement of § 7.7 and § 7.8.1, Section II of the Rulebook.

b) Definition of Acceptable Collateral, Valuation Prices, Haircuts and Concentration Limits for meeting the Margin Requirement of § 5.2 and § 5.3, Section II of the Rulebook.

c) Rules for calculating the Default Fund of § 6.2, § 6.4.1 and § 6.4.2, Section II of the Rulebook.

d) The Cash Holdings of § 3.2 and § 6.1, Section II of the Rulebook.

e) Implementation of the Credit Limits of § 7.8.1, Section II of the Rulebook.

f) Provision of information for the management of related risk concentrations as per § 2.4.12, Section II of the Rulebook.

1.2 Definitions

1. The terms and definitions used in this Resolution shall have the same meaning as the corresponding terms and definitions in the Rulebook, unless otherwise expressly stipulated.

2. In all cases, the provisions of this Resolution shall be construed in accordance with the rules and principles set out in paragraph 5 of the Scope of the Rulebook.

Article 2. Calculation of the Margin Requirement of § 7.7 and § 7.8.1, Section II of the Rulebook

2.1 Margin Requirement Calculation

1. The Margin requirement is calculated:

   a) following the finalization of positions for the purpose of verifying the adequacy of the Collateral of the respective Account and assigning the Credit Limits of § 7.7, Section II of the Rulebook, as well as

   b) at regular intervals throughout the trading session, for the purpose of adjusting Credit Limits and calculating and checking the Intraday Risk Variation of § 7.8.1, Section II of the Rulebook.

2. The Margin requirement is calculated on the basis of the model used by ATHEXClear and is based on the calculation of the loss that would be caused by an adverse change in the value of the total open position corresponding to a Clearing Account, during the time it would take to close such position in the worst case scenario with a certain level of confidence, as such levels are determined by means of the Margin calculation parameters. Specifically in the case of a Clientele Clearing Account that is flagged as not being subject to netting arrangements in accordance with article 4.1.1, par. 4, Section II of the Rulebook, the calculation is based on the assessment of the loss that would be caused by an adverse change in the value of the open position separately of each Position Account belonging to the Clearing Account, during the time it would take to close such positions, without netting gains and losses

across different position accounts, in the worst case scenario with a certain level of confidence, as such levels are determined by means of the Margin calculation parameters.[1]

3. For the purpose of estimating the Risk of the total position, account is taken of all obligations which burden the Clearing Account and could potentially increase the risk of the open position, such as, by way of indication, outstanding physical settlement obligations as of the day on which the relevant obligation arose, or cash settlement obligations following dividend cut-off or return of capital in Securities Lending Agreements as of the cut-off date.
4. ATHEXClear shall at any time be entitled to modify the calculation and valuation methods for any variable used to determine Margin for the purpose of protecting the market. ATHEXClear shall also be entitled at any time to increase the Margin requirements not only for all Clearing Accounts but also for individual Accounts, and to set a deadline for meeting such requirements, particularly taking into consideration any imminent Risks.

2.2 Margin Calculation Parameters

1. The parameters used by the Margin calculation model are set by underlying value, product and/or overall for the market and are posted on ATHEXClear's website. These parameters include:

    a) the Valuation Interval (%) for Futures and Options,

    b) the Adjustment Factor (%) for Futures,

    c) the Fixed Volatility (%) for Options,

    d) the Volatility Interval for Options (%),

    e) the Risk Free Rate for Options (%),

    f) the Margin for Securities Lending Products (%),

    g) any other parameter deemed necessary for calculating Margin.

2.3 Methodology for Determining and Adjusting Margin Calculation Parameters

1. The parameters used in calculating the Margin of § 2.2 are regularly reviewed and adjusted on a quarterly basis within a time limit of ten (10) business days from the beginning of each calendar quarter or on an extraordinary basis, by applying the calculation methodology detailed in the following paragraphs and the specific procedures of ATHEXClear. For each adjustment, ATHEXClear shall announce the new parameter values and when they are to be applied.

2. ATHEXClear shall also conduct backtesting on a daily basis to verify Margin adequacy, in accordance with § 2.4.1 of this Resolution, as well as a sensitivity analysis on a monthly or more frequent basis in order to assess the Margin calculation model, in accordance with § 2.4.2 of this Resolution, and, in cases of insufficient coverage on the basis of its specific procedures, shall carry out an extraordinary adjustment to the parameter values or adjust their calculation methodology, each time announcing when any changes are to be applied.

3. The methodology for calculating the parameter values that are taken into account in the Margin calculation model is based on the following data.

a) Confidence Level

(i) This is the Confidence Level on the basis of which the calculated Margin should – on the evidence of statistical tests performed – cover the relevant exposures.

(ii) The Confidence Level is set at 99.0%.

b) Clearing Period Time Frame

(i) This is the period of time that is estimated will elapse from the last commitment and valuation of Collateral and the securing of the Risk entailed by the position up until its final closure. For the purpose of determining the "Clearing Period Time Frame", categories of liquidity are created, in accordance with the specific procedures of ATHEXClear, to which the underlying securities are assigned on the basis of their characteristics and liquidity.

(ii) A Clearing Period Time Frame value, which may not be less than two (2) days, is set for each liquidity category. The Margin calculation parameters are calculated in such a way that, based on historical data, they cover – with the above confidence level – changes corresponding to a period of time equal to the Clearing Period Time Frame.

c) Time Frame for Calculating Historical Volatility

(i) This is the time period whose historical changes will be used to estimate parameters with the above confidence level.[2]

(ii) Parameters are calculated on the basis of data for:

- the last twelve (12) months, which are weighted with a coefficient of 75% and
- one 3-month period from the last five (5) years which is chosen as being representative of stressed market conditions, which are weighted with a coefficient of 25%.

The respective parameters are calculated for the aforesaid periods by using the confidence level and clearing period time frame as these are defined above.[3]

(iii) The Margin parameters for underlying securities for which there are no available data that would allow application of one of the above methods are calculated on the basis of data for the past twelve (12) months. In such cases, a reserve equal to 25% is added to the parameters, so that it can be temporarily exhausted in periods when estimated Margin requirements rise significantly.[4]

d) Offsetting Position Risk

When calculating Margin, no kind of Risk offsetting is performed between positions in derivatives with a different underlying security. For derivatives with a common underlying security it is recognized, in accordance also with the Margin calculation model, that the common underlying security will have the same price for all the derivative products with the same underlying security for the different scenarios considered.

4. In cases of corporate actions relating to Securities Lending Products which involve the distribution of bonus shares due to a share capital increase through the capitalization of reserves or profits or due to a change in the nominal value of stock (stock split), a share capital increase through payment in cash and pre-emption right in favour of existing shareholders and a stock consolidation due to a change in the nominal value of stock (reverse stock split), ATHEXClear adjusts the relevant Margin calculation parameters on the basis of the price adjustment of the underlying security which takes place as a consequence of the corporate action, on the day of price adjustment of the underlying security.

2.4 Testing of Margin Calculation Model and Parameters

2.4.1 Backtesting

1. ATHEXClear assesses Margin coverage on a daily basis by performing a retrospective comparison between observed results and anticipated results deriving from the use of the Margin model. This test is performed for all Clearing Accounts and cleared products, in order to assess whether there are any exceptions with regard to Margin coverage.
2. The basic principle underpinning this backtesting is that the Margin calculated for each Clearing Account is taken into consideration. Using actual market prices, the cost of closing a position is calculated. The divergence between these two values is assessed both at a Clearing Account level and overall, on the basis of its frequency and magnitude.

2.4.2 Sensitivity Analysis

1. ATHEXClear performs sensitivity analysis of its Margin model's coverage under various market conditions, using historical data from actual stressed market conditions and hypothetical data for possible stressed market conditions.

2. The analysis is a methodology to investigate concealed shortcomings that cannot be revealed through backtesting. Its purpose is to ascertain how the key parameters and assumptions of the Margin model are shaped in different scenarios, in order to establish the model's sensitivity to errors when determining such parameters and assumptions.

Article 3. Definition of Acceptable Collateral, Valuation Prices, Haircuts and Concentration Limits for the purpose of meeting Margin Requirements as per § 5.2 and § 5.3, Section II of the Rulebook

3.1 Acceptable Collateral

1. The following are considered to be acceptable collateral in the sense of § 5.2, Section II of the Rulebook:

a) cash in euros,

b) ATHEX-listed stocks with a 3-month average daily trading value greater than the limit set and announced by ATHEXClear, which constitute underlying assets of Futures Contracts on the ATHEX Derivatives Market or belong to the FTSE/ATHEX-LARGE CAP or FTSE/ATHEX-MID CAP indices with the exception of stock issued by "HELLENIC EXCHANGES - ATHENS STOCK EXCHANGE S.A. HOLDING". Such stock shall constitute acceptable Collateral only for positions in products settled in euros. In cases where a transferable security is switched to a different index in accordance with the provisions of the ATHEX Rulebook, the security in question shall no longer be acceptable as Margin and, if already provided as Margin, shall cease to be included in the calculation of the relevant Margin.

In the event of suspension of trading of Futures on the ATHEX Derivatives Market, in accordance with the provisions of the ATHEX Rulebook, the underlying transferable security shall no longer be acceptable as Margin and, if already provided as Margin, shall cease to be included in the calculation of the relevant Margin.[5] [6]

c) ATHEX-listed units in the segment of Exchange Traded Funds (hereinafter "ETF units"), with a 3-month average daily trading value greater than the limit set and announced by ATHEXClear.[7]

In cases where a transferable security is switched to a different index in accordance with provisions of the ATHEX Rulebook, the security in question shall no longer be acceptable as

Margin and, if already provided as Margin, shall cease to be included in the calculation of the relevant Margin.[8]

2. The 3-month average daily trading value of each transferable security (stock or ETF unit) is checked on a daily basis against the limit set by ATHEXClear. If the 3-month average daily trading value is lower than the limit set, the security shall cease to be acceptable as Margin as of the effective date of the new list of eligible collaterals announced by ATHEXClear.

3. In order for ATHEXClear to receive collateral in accordance with articles 7.7 and 7.8, Section II of the Rulebook, the Clearing Member must declare the method of collateral allocation per Clearing Account. For the receipt of collateral in the form of cash and in the form of transferable securities, the declaration is electronically communicated to ATHEXClear via the System.

4. For the release of collateral received by ATHEXClear in the form of cash or transferable securities, in accordance with par. 5, article 5.5, Section II of the Rulebook, the Clearing Member makes a declaration of release which is electronically transmitted to ATHEXClear via the System.[9]

   Collateral is returned, when having been provided in the form of cash, on the business day following the declaration day, unless the competent services of ATHEXClear deem it necessary to return the collateral earlier for the purpose of meeting obligations in connection with the System, while when provided in the form of transferable securities, on the day of the declaration.[10] [11]

3.2 Collateral Valuation

Collateral is valued at its market value on the basis of the prices stipulated in § 3.2.1, followed by application of the Haircuts of § 3.2.2 and Concentration Limits of § 3.2.3.

3.2.1 Collateral Valuation Prices

For the purpose of testing Collateral adequacy following the finalization of positions pursuant to § 7.7, Section II of the Rulebook, stocks and ETF units are valued on the basis of the last available closing price on the market in which they are traded.

1. For the purpose of adjusting Credit Limits and calculating the Intraday Risk Variation during the trading of § 7.8.1, Section II of the Rulebook, stocks and ETFs are valued on the basis of the last available trading price on the market in which they are traded and, if no transactions have been carried out, on the basis of the opening price.[12]

2. In every case, transferable securities that have been issued by the Clearing Member that provides them as Collateral or by an entity belonging to the same group as the Clearing Member that provides them as Collateral, are valued at zero.

3.2.2 Haircuts

1. The Haircuts used in the valuation of collateral are determined, in accordance with the methodology set out in the following paragraphs, per transferable security or category of financial instrument and are published on the ATHEXClear website.

2. Haircuts are reviewed and adjusted on a quarterly basis at the beginning of each calendar quarter, applying the methodology set out in the following paragraphs and the specific procedures of ATHEXClear. Following each regular adjustment, ATHEXClear shall announce the new Haircut values and when they are to take effect.

3. ATHEXClear also runs monthly backtesting to assess the adequacy of Haircuts in accordance with the methodology of § 3.3 and, in the event of inadequate coverage, as determined by its specific procedures, it shall perform an extraordinary adjustment of their value and/or adjust the methodology used for their calculation and/or modify the list of acceptable Collateral, announcing each time when these are to take effect.

4. The methodology for calculating Haircut values is based on the following data.

a) Confidence Level

This is the confidence level on the basis of which, with the use of statistical tests, the Haircut value of Collateral must be greater than its value upon liquidation. The Confidence Level is set at 99.9%.[13]

b) Collateral Liquidation Time Frame

i) This is the period of time that is estimated will elapse between the last valuation of the collateral committed and its liquidation. For the purpose of determining the "Collateral Liquidation Time Frame", categories of liquidity have been created, in accordance with the specific procedures of ATHEXClear, to which Collateral is assigned on the basis of its characteristics and liquidity.

ii) A Collateral Liquidation Time Frame value, which may not be less than two (2) days, is set for each liquidity category. The Haircut is calculated in such a way that, based on historical data, it covers – with the above confidence level – changes corresponding to a period of time equal to the Collateral Liquidation Time Frame.

iii) [14]

c) Time Frame for Calculating Historical Volatility

This is the time period whose historical changes will be used to estimate Haircuts with the above confidence level.

i) To ensure that the historical data used in the calculation of historical volatility include a period of stressed conditions, while resulting in the computation of stable and prudent Haircuts that limit procyclicality, two (2) periods are taken into account for estimating parameters:

- The last twelve (12) months.
- One 3-month period from the last five (5) years which is chosen as being representative of stressed market conditions, in accordance with the procedures of ATHEXClear.[15]

ii) Haircuts are calculated for the aforesaid periods by using the confidence level and clearing period time frame as these are defined above.

iii) The final parameter is calculated by applying a weighting factor of 75% to the parameter for the last 12 months and a weighting factor of 25% to the parameter for the period of stressed market conditions.

iv) In every case, the final parameter shall be set at least equal to the parameter for the last 12 months.

v) If no data are available for a period representative of stressed market conditions, a reserve equal to 25% shall be added to the Haircuts.

3.2.3 Collateral Concentration Limits

1. In implementation of § 5.2, Section II of the Rulebook, Concentration Limits are set in accordance with the provisions of the following paragraphs. The Concentration Limit values are determined by ATHEXClear and posted on its website:

a) For stocks and ETFs that are acceptable as Collateral, a maximum quantity is set per security, which will be valued for the purpose of covering the Margin requirement for each Clearing Account and corresponds to a percentage of the issue.

b) For the purpose of verifying the adequacy of Collateral after the finalization of positions, a percentage of Margin requirement is set per Clearing Account which must be covered with cash on a daily basis.[16] [17]

c) For each banking group that issues Collateral, the percentage of the final haircut value of Collateral held by ATHEXClear (Collateral committed for Margin, including contributions to the Default Fund) which is covered by Collateral of an issuer belonging to each aforesaid group shall be calculated on a daily basis, taking into account the respective haircut value after implementation of the measures under item a. In the event that this coverage rate exceeds 10%, the Collateral in question shall cease to be considered acceptable. Collateral that has been committed prior to implementation of the measure shall continue to be valued in the normal manner, while in cases where a large amount of certain Collateral has been provided which does not cover Margin requirements, ATHEXClear may force its release and set a deadline for this purpose.[18]

d) For shares and ETFs which are acceptable as Collateral, a further limit is set for each security as the maximum value that will be assessed for covering the Margin requirement of each Clearing Account. The aforesaid limit is reviewed and adjusted on a monthly basis at the beginning of each calendar month and is set as the 5% lowest value of transactions according to the liquidation time frame of each share or ETF of the past 5-year period.[19]

3.3 Haircut Backtesting

1. ATHEXClear assesses the adequacy of Haircuts by conducting a comparison between the Haircut applied in the previous test period and the historical changes in the value of each item of Collateral. The divergence between these two magnitudes is assessed, per each item of Collateral and in total, on the basis of the number of exceptions as well as the percentage and amount of overruns.

Article 4. Rules for Calculating the Default Fund as per § 6.2, § 6.4.1 and § 6.4.2, Section II of the Rulebook.

4.1 Default Fund Calculation Period as per § 6.4.2, Section II of the Rulebook

1. The size of the Default Fund is calculated on a monthly basis and for the purposes hereof the term "calculation periods" refers to the periods from the first day to the last day of each month in a calendar year.

4.2 Contribution Rate as per § 6.4.1, Section II of the Rulebook

1. The Contribution Rate (α) of § 6.4.1, Section II of the Rulebook is set at least equal to 30%.

2. During the regular or extraordinary adjustment of the size of the Default Fund following checks carried out by ATHEXClear in accordance with § 6.4.2, Section II of the Rulebook and the specific provisions set out in § 4.3 of this Resolution, the Contribution Rate may be increased so that, taking into consideration the adjusted Default Fund, it meets the respective requirements. The Contribution Rate applied in each case will be posted on the website of ATHEXClear along with the new size of the Default Fund.

4.3 Resource Adequacy Testing

4.3.1 Stress tests to determine the adequacy of the Default Fund size

1. ATHEXClear applies a methodology to test whether the size of the Default Fund would be adequate, for every day in the test period, to cover losses in excess of Margin under extreme but plausible market conditions (stress testing), which may arise in the event of default of a Clearing Member to which the System has the greatest risk exposure or of the second and third Clearing Members, if their cumulative exposure is higher, taking into account the dependencies of their groups, in accordance also with its specific procedures, while it also tests the adequacy of the Default Fund in the event of default of a Clearing Member that issues financial instruments cleared by ATHEXClear.

2. When adjusting the Default Fund, ATHEXClear applies the above testing methodology to the new size of the Default Fund for a test period that is equal to the calculation period. In the event of inadequacy, ATHEXClear shall modify the Contribution Rate of § 4.2 of this Resolution, adjusting the size of the share account of each Clearing Member so that, taking into consideration the adjusted Default Fund, the respective deficit is covered.

3. ATHEXClear applies the above methodology on a daily basis to test the current size of the Default Fund for the previous day (test period). In the event of inadequacy, it takes a decision to cover the deficit by increasing the available resources to at least the above level by no later than the margin call of the following day, which may involve an extraordinary increase of the Default Fund and/or an increase in the Margin for one or more Clearing Accounts.

4.3.2. Stress tests to determine the adequacy of total financial resources

1. ATHEXClear applies a methodology to test whether the size of the Default Fund and the Special Own Resources of ATHEXClear would be adequate to cover the loss in the event of a default of the Clearing Members ranking first and second in terms of exposure, taking into account the dependencies of their groups, in accordance also with its specific procedures.

2. When adjusting the Default Fund, ATHEXClear applies the above testing methodology to the new size of the Default Fund and the Special Own Resources it will hold, for a period that is equal to the calculation period (test period). In the event of inadequacy, ATHEXClear shall modify the Contribution Rate of § 4.2

of this Resolution, adjusting the size of the share account of each Clearing Member and/or increasing the Special Own Resources so that, taking into consideration the adjusted size of total financial resources, the respective deficit is covered.

3. ATHEXClear applies the above methodology on a daily basis to test the current size of the Default Fund and Special Own Resources it holds for the previous day (test period). In the event of inadequacy, it takes a decision to cover the deficit by increasing the available resources to at least the above level by no later than the margin call of the following day, which may involve an extraordinary increase of the Default Fund and/or an increase in Margin for one or more Clearing Accounts and/or an increase in Special Own Resources.

4. At quarterly or more frequent intervals, ATHEXClear also plans and performs reverse stress testing under extreme conditions, tailored to the specific Risks of the markets and the products it clears, the aim of which is to ascertain under which market conditions the credit risk coverage provided by the combination of Margin, Default Fund and other financial resources may be inadequate. The purpose of the reverse stress tests in extreme conditions is to identify market conditions that go beyond those that are considered plausible. The results and analysis of the reverse stress tests in extreme conditions are used to help establish extreme but plausible stress test scenarios.

4.3.3. Liquidity stress tests to determine the adequacy of realizable financial resources

1. ATHEXClear applies a methodology to analyze and monitor its liquidity Risk management framework by conducting stress tests under extreme conditions on its realizable financial resources on a daily basis. In the event of inadequacy, in accordance also with its specific procedures, it shall take a decision to cover the deficit by increasing its available resources to an acceptable level as soon as is practicable, which may involve an extraordinary increase of the Default Fund, an increase in the Margin that must be covered by cash for one or more Clearing Accounts, an increase of Special Own Resources or the securing of liquidity lines with credit institutions.

2. At quarterly or more frequent intervals, ATHEXClear also plans and performs reverse stress testing under extreme conditions, tailored to the specific Risks of the markets and the products it clears, the aim of which is to ascertain under which market conditions the liquidity risk coverage provided by its total realizable resources may be inadequate. The purpose of the reverse stress tests in extreme conditions is to identify market conditions that go beyond those that are considered plausible. The results and analysis of the reverse stress tests in extreme conditions are used to help establish extreme but plausible liquidity risk stress test scenarios.

4.4 Adjustment of Default Fund share account due to corporate actions or other events involving Clearing Members as per § 6.2, Section II of the Rulebook

1. In the event of a merger of Clearing Members or of other related corporate actions, the Default Fund share account of the Member retaining such capacity shall be set equal to the sum of all share accounts of all merged Members up until the next regular or extraordinary adjustment of the Default Fund. At the next regular or extraordinary adjustment of the Default Fund, for the purpose of determining the share account of the Member retaining such capacity, the share account is first calculated for the Member having such capacity for that part of the calculation period prior to the merger, taking into consideration the Margin of the Clearing Accounts of all merged Members, and then the share account is calculated for the Member that retains such capacity for that part of the calculation period after the merger, taking into consideration only the Margin of the Clearing Accounts of the Member retaining such capacity. For the purpose of finally determining the share account of the Member that retains such capacity, the share accounts resulting from the above calculations shall be taken into consideration, based on the number of days of each above period.

2. In cases where a Clearing Account is transferred to another Clearing Member, at the next regular or extraordinary Default Fund adjustment and for the purpose of determining the share account of the Member to whom the account is transferred, such member's share account shall be computed for that part of the calculation period prior to the transfer, taking into account the Margin of the Account being transferred, while its share account for that part of the calculation period after the transfer shall also be calculated. For the purpose of finally determining the share account of the Member to whom the Account is transferred, the share accounts resulting from the above calculations shall be taken into consideration, based on the number of days of each above period.

3. In cases where a Clearing Account is cancelled, including its transfer to another Member, for the purpose of determining the share account of the Clearing Member whose Clearing Account has been cancelled, at the next regular or extraordinary Default Fund adjustment, its share account shall be calculated without taking into account the Margin of the Clearing Account that has been cancelled.

Article 5. Cash Holdings of § 3.2 and § 6.1, Section II of the Rulebook

5.1 Cash Holdings

1. The cash holdings of ATHEXClear which correspond to Collateral in the form of cash provided by Clearing Members, as well as the cash holdings of the Default Fund and Special Own Resources, are kept by ATHEXClear in an account it holds as a Target 2 Direct Participant at the Bank of Greece.

2. The cash holdings of ATHEXClear which correspond to other financial resources are kept by ATHEXClear in accounts at the Bank of Greece and at credit institutions in accordance with the investment policy and the terms laid down in article 45 of Regulation (EU) 153/2013.

3. In the case of Collateral deposited, in accordance with the procedures of ATHEXClear, at a credit institution in the form of cash in a foreign currency, ATHEXClear applies arrangements that enable its conversion into euros and its holding at the Bank of Greece, in accordance with the following specific provisions. In particular, by virtue of a standing order from ATHEXClear, the aforesaid credit institution each day carries out a currency conversion of the Collateral amount into euros and then credits the Target2 account of ATHEXClear. On the next business day, ATHEXClear transfers the amount credited from the collateral currency conversion into euros to a cash account it keeps in its name at the credit institution, in order for the credit institution to convert the currency of the collateral amount from euros into a foreign currency amount equal to the Collateral amount originally deposited.

Article 6. Application of the Credit Limits of § 7.8.1, Section II of the Rulebook

6.1 Credit Limits

1. Prior to the start of a trading session, ATHEXClear determines the Credit Limit (CL) for each Clearing Account, on the basis of its available coverage in the sense of § 7.7, Section II of the Rulebook.

2. Subsequently, each Clearing Member is able, through the Clearing System, to allocate the Credit Limit of the Clearing Account to the respective Credit Limits it sets for each Clearing Subaccount & Market Member ($CL_{Subaccount\&Member}$), which ATHEXClear then enters in the Trading System via the Market Operator.

3. The amount of Credit Limit (CL) of each Clearing Account which is not assigned to a Market Member shall be considered an Unallocated Credit Limit of the Clearing Account ($CL_{unallocated}$).

6.2 Using up of Credit Limits by Trading Members during trading

1. During a Market session, the Credit Limit used up on the basis of unfilled orders entered in the Market by a Market Member and the transactions concluded by the latter during that session shall be gradually subtracted from the Credit Limit of each Clearing Member, per Clearing Subaccount and Market Member ($CL_{Subaccount\&Member}$).

2. For this purpose, Intraday Risk (R_{day}) is calculated as the aggregate of the Risk arising from active orders (R_{orders}) and the Risk from trades already concluded (R_{trades}), as calculated in accordance with § 6.2.1 and § 6.2.2 respectively.

$$R_{day} = R_{orders} + R_{trades}$$

More specifically:

1) when each order is entered, the new Order Risk (R_{orders}) is calculated by adding the Risk from the new order to the existing Risk. If the total Intraday Risk (R_{day}) is covered by the Clearing Member's Credit Limit per Clearing Subaccount and Market Member, the order shall be recorded in the order book, otherwise it shall be rejected;

2) after every order cancellation, the new Order Risk (R_{orders}) shall be calculated by subtracting the Risk that the cancelled order had added;

3) when an order is executed, the new Order Risk (R_{orders}) is calculated by subtracting the Risk that had been added by the executed order, while the new Trading Risk (R_{trades}) is calculated by adding the Risk arising from the new trade.

6.2.1 Calculation of Order Risk

1. Order risk (R_{orders}) is the risk assumed by a Clearing Member from orders that remain active during the trading session. It is computed prior to the entry of each order per Clearing Subaccount held by the Clearing Member and Market Member to which it has assigned a Credit Limit:

2. Depending on the product to which the order relates, it is calculated as follows:

a) Futures Contracts

[Number of Contracts] · [Size of Contract] · [Contract Order Price] · [Risk Factor]

In the case of market orders and at-the-close orders, the order price used is that of the last transaction in the Futures Contract at the time of order entry or, if no transactions have been carried out, the opening price of the Futures Contract. The Risk Factor is set equal to the Margin calculation parameter “Valuation Interval (%) for Futures” plus the parameter “Adjustment Factor (%) for Futures”.

In the case of a standard combination order with different expiration dates, the Risk for the order is calculated using the following formula, while the Risk for orders entered automatically by the system in execution of the standard combination order will not be calculated.

$$2 \cdot [\text{Number of Contracts}] \cdot [\text{Size of Contract}] \cdot [\text{Price of Underlying Security}] \cdot [\text{Risk Factor}]$$

The price of the underlying security shall be its last available price at the time of order entry. If no price is available from transactions in the underlying security, its opening price will be used. The Risk Factor is set equal to the Margin calculation parameter "Adjustment Factor (%) for Futures".

b) Options

$$[\text{Number of Contracts}] \cdot [\text{Size of Contract}] \cdot [\text{Price of Underlying Security}] \cdot \frac{[\text{Risk Factor}]}{2}$$

The price of the underlying security shall be its last available price at the time of order entry. If no price is available from transactions in the underlying security, its opening price will be used. The Risk Factor is set equal to the Margin calculation parameter "Valuation Interval (%) for Options".

c) Stock Borrowing Contracts

$$[\text{Number of Contracts}] \cdot [\text{Size of Contract}] \cdot [\text{Price of Underlying Security}] \cdot [\text{Risk Factor}]$$

The price of the underlying security shall be its last available price at the time of order entry. If no price is available from transactions in the underlying security, its opening price will be used. The Risk Factor is set equal to the Margin calculation parameter "Stock Borrowing Margin (%)".

Order Risk is not calculated for stock lending orders.

6.2.2 Calculation of Trading Risk

1. Trading risk (R_{trades}) is the risk assumed by a Clearing Member from transactions concluded during the trading session. It is computed after the execution of each transaction per Clearing Subaccount held by the Clearing Member and Market Member to which it has assigned a Credit Limit.

2. Depending on the product to which the order relates, it is calculated as follows:

a) Futures Contracts

$$[\text{Number of Contracts}] \cdot [\text{Size of Contract}] \cdot [\text{Futures Transaction Price}] \cdot [\text{Risk Factor}]$$

The Risk Factor is set equal to the Margin calculation parameter "Valuation Interval (%) for Futures" plus the parameter "Adjustment Factor (%) for Futures".

In the case of transactions arising from the execution of a standard combination order with different expiration dates, the Risk is calculated separately for individual transactions, in accordance with the following formula.

[Number of Contracts] · [Size of Contract] · [Futures Transaction Price] · [Risk Factor]

The Risk Factor is set equal to the Margin calculation parameter "Adjustment Factor (%) for Futures".

b) Options

$$[\text{Number of Contracts}] \cdot [\text{Size of Contract}] \cdot [\text{Price of Underlying Security}] \cdot \frac{[\text{Risk Factor}]}{2}$$

The price of the underlying security shall be its last available price at the time of transaction execution. If no price is available from transactions in the underlying security, its opening price will be used. The Risk Factor is set equal to the Margin calculation parameter "Valuation Interval (%) for Options".

c) Stock Borrowing Contracts

[Number of Contracts] · [Size of Contract] · [Price of Underlying Security] · [Risk Factor]

The price of the underlying security shall be its last available price at the time of transaction execution. If no price is available from transactions in the underlying security, its opening price will be used. The Risk Factor is set equal to the Margin calculation parameter "Stock Borrowing Margin (%)".

Trading Risk is not calculated for stock lending orders.

6.3 Adjustment of Clearing Account Credit Limits

1. The Risk assumed by each Clearing Account is recalculated at regular intervals (every 5 minutes) during the trading session and the Credit Limit (CL) is decreased or increased by applying the methodology set out below.

CL =	Haircut Collateral Value at current prices	(§ 6.3.1)
	+ Gain from valuation of open Futures positions at current prices	(§ 6.3.3)
	+ Outstanding Receipts from sale of Options	(§ 6.3.4)
	+Trading Risk of Subaccounts	(§ 6.2.2)
	- Margin at current prices	(§ 6.3.2)

- Loss from valuation of open Futures positions at current prices (§ 6.3.3)

- Outstanding Payments from purchase of Options (§ 6.3.4)

If the Clientele Clearing Account is flagged as not being subject to netting arrangements in accordance with article 4.1.1, par. 4, Section II of the Rulebook, the calculation is made as follows:

CL = Haircut Collateral Value at current prices

+ Trading Risk of Subaccounts

+ $\sum_{\text{for each Position Account of the Clearing Account}}[(\min(0,$

Gain from valuation of open Futures positions at current prices

+ Outstanding Receipts from sale of Options

- Margin at current prices

- Loss from valuation of open Futures positions at current prices

- Outstanding Payments from purchase of Options)][20]

2. Next, the size of the Unallocated Credit Limit ($CL_{unallocated}$) is also recalculated as the amount of the Credit Limit of the Clearing Account which has not yet been allocated to a Trading Member. Market Member Credit Limits that have already been assigned shall remain unchanged.

3. During the trading session, a Clearing Member may decrease and/or increase the Credit Limits which it has allocated to Market Members subject to the following requirements.

   a) Clearing Subaccount and Market Member Credit Limit Increase

      A Clearing Member may increase the Credit Limit of a Clearing Subaccount and Market Member through the Clearing System, provided it has an equivalent Unallocated Credit Limit in the Clearing Account. Following the increase, the Unallocated Credit Limit ($CL_{unallocated}$) of the Clearing Account is decreased by the same amount.

   b) Clearing Subaccount and Market Member Credit Limit Decrease

      A Clearing Member may decrease the Credit Limit of a Clearing Subaccount and Market Member through the Clearing System, to the extent that the new Credit Limit of the Clearing Subaccount and Market Member covers the Intraday Risk (R_{day}) that has already been assumed.

6.3.1 Collateral Haircut

1. The collateral haircut is calculated (every 5 minutes) during the trading session as the haircut value of the Collateral provided per Clearing Account in accordance with the provisions of § 3.2.

6.3.2 Margin

1. Margin is calculated (every 5 minutes) during the trading session as the Margin Requirement per Clearing Account in accordance with the provisions of § 2.1, taking also into consideration, for the purpose of shaping the open positions per clearing Account, the transactions that have already been carried out during the session for all of its Subaccounts.

2. If the Clearing Account is flagged as not being subject to netting arrangements in accordance with article 4.1.1, par. 4, Section II of the Rulebook, the Margin is calculated per Position Account, taking into consideration the open positions of the Position Account and the transactions that have already been carried out during the respective session.[21]

6.3.3 Gain/Loss from the valuation of open positions in Futures at current prices

1. This is calculated (every 5 minutes) during the trading session per Clearing Account or Position Account as the current estimate of the monetary claim (loss) or right (gain) that must be settled the following day and relates to claims or rights arising from the valuation of open positions in Futures.[22]

2. The estimate involves:

   a) the calculation of the valuation difference of open positions, as these had been shaped before the start of the session, between the previous daily clearing price and the price of the last transaction in the contract or, if no transactions have been conducted, the opening price of the contract;

   b) the calculation of the valuation difference of transactions conducted during the session, between the price of each transaction and the price of the last transaction in the contract or, if no transactions have been conducted, the opening price of the contract.

6.3.4 Outstanding Receipts/Payments from the Sale/Purchase of Options

1. This is calculated (every 5 minutes) during the trading session per Clearing Account or Position Account as the monetary claim (payment) or right (receipt) which must be settled the following day and relates to claims or rights arising from the settlement of options.[23]

2. The calculation involves:

a) the calculation of the right (receipt) from the sale of options during the session on the basis of the price of each transaction.

b) the calculation of the claim (payment) from the purchase of options during the session on the basis of the price of each transaction.

6.4 Intraday Risk Variation Testing

1. Intraday Risk Variation (IRV) is calculated at regular intervals (every 5 minutes) throughout the trading session using the following methodology.

IRV=	- Haircut value of Collateral at current prices	(§ 6.3.1)
	- Gain from valuation of open positions in Futures at current prices	(§ 6.3.3)
	- Outstanding Receipts from sale of Options	(§ 6.3.4)
	+ Margin at current prices	(§ 6.3.2)
	+ Loss from valuation of open positions in Futures at current prices	(§ 6.3.3)
	+ Outstanding Payments from purchase of Options	(§ 6.3.4)

If the Clearing Account is flagged as not being subject to netting arrangements in accordance with article 4.1.1, par. 4, Section II of the Rulebook, the calculation is made as follows:

IRV = - Haircut Collateral Value at current prices

+ $\sum_{\text{for each Position Account of the Clearing Account}}[(\max(0,$

- Gain from valuation of open Futures positions at current prices

- Outstanding Receipts from sale of Options

+ Margin at current prices

+ Loss from valuation of open Futures positions at current prices

+ Outstanding Payments from purchase of Options)][24]

2. If the Intraday Risk Variation (IRV) for a Clearing Account is greater than the Intraday Risk Variation Limit set and posted by ATHEXClear on its website, all the Credit Limits of Market Members whose transactions are cleared through that Clearing Account shall be immediately zeroed, thereby making it impossible to enter new orders until additional Collateral has been provided which causes the Intraday

Risk Variation to fall below the Intraday Risk Variation Recovery Limit set and posted by ATHEXClear on its website.

Article 7. Provision of information for the management of related Risk concentrations as per § 2.4.12, Section II of the Rulebook

7.1 Provision of information

1. ATHEXClear shall monitor the size and progress of open positions at both Clearing Account and Position Account level and, where there are indications of a possible increase in Risk concentrations, particularly with regard to clients who clear trades through different Clearing Members, it shall ask Clearing Members, in implementation of § 2.4.12, Section II of the Rulebook, to provide additional information to enable the identification, control and management of related Risk concentrations.
2. Such information shall primarily comprise data that enable the identification of Clearing Members' clients, the positions they hold, as well as the quantity and type of collateral they have provided to the Clearing Member.

Article 8. Effect

1. This Resolution is effective as of 1 December 2014.

2. This Resolution is to be posted on the website of ATHEXClear.

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[1] *Subparagraph 2, paragraph 2.1 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[2] *The second part of sub-item (i) of item 3), subparagraph 3, par. 2.3 of article 2 was replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[3] *The previous sub-item (ii) of item 3), subparagraph 3, par. 2.3 of article 2 was abolished and the existing sub-item (iii) was renumbered as (ii) and replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[4] *The previous sub-item (iv) of item 3), subparagraph 3, par. 2.3 of article 2 was renumbered as (iii) and replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[5] *The previous item 3), subparagraph 1, par. 3.1 of article 3 was abolished and the existing iitem 4) was renumbered as 3) by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[6] *Item 2), subparagraph 3.1, article 3 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[7] *Item 3), subparagraph 3.1, article 3 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[8] *The previous item 5), subparagraph 1, par. 3.1 of article 3 was renumbered as 4) by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[9] *The first sentence of subparagraph 4, par. 3.1 of article 3 was replaced as above by virtue of decision no. 165/26.11.2018 of the Board of Directors of ATHEXClear with effect as of 10.12.2018.*

[10] *Subparagraph 4, par. 3.1 of article 3 was replaced as above by virtue of decision no. 125/26.10.2015 of the Board of Directors of ATHEXClear and is effective as of 2.2.2015. Subparagraph 4, par. 1.3 of article 3 was renumbered as subparagraph 5 as above by virtue of Decision 125/26.10.2015 of the Board of Directors of ATHEXClear with effect as of 9.11.2015.*

[11] *Subparagraphs 3 and 4 par.3.1, article 3 of the Resolution were amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[12] *Subparagraph 1, par. 3.2.1, article 3 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[13] *Item 1), subparagraph 4, par. 3.2.2 of article 3 was replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[14] *Sub-item iii) of item b, subparagraph 4, par. 3.2.2 of article 3 was abolished as above by virtue of decision no. 164/29.10.2018 of the Board of Directors of ATHEXClear with effect as of the next regular calculation of risk parameters (January 2019).*

[15] *The third part of sub-item (i), item 3), subparagraph 4, par. 3.2.2 of article 3 was replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear.*

[16] *The previous items 2) and 3), subparagraph 1, par. 3.2.3 of article 3 were abolished and the existing item 4) was renumbered as 2) by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[17] *Item 2) of par. 3.2.3, article 3 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[18] *The previous item 5), subparagraph 1, par. 3.2.3 of article 3 was renumbered as 3) and replaced as above by virtue of decision no. 112/26.1.2015 of the Board of Directors of ATHEXClear with effect as of 2.2.2015.*

[19] *Item d) of subparagraph 1, par. 3.2.3 of article 3 was added as above by virtue of decision no. 164/29.10.2018 of the Board of Directors of ATHEXClear with effect as of the next regular calculation of risk parameters (January 2019).*

[20] *The second part of paragraph 1, subparagraph 6.3, article 6 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[21] *Subparagraph 2, par. 6.3.2, article 6 of the Resolution was added as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[22] *Subparagraph 1, par. 6.3.3, article 6 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[23] *Subparagraph 1, par. 6.3.4, article 6 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*

[24] *The second part of paragraph 1, subparagraph 6.4, article 6 of the Resolution was amended as above by virtue of decision no. 153/27.11.2017 of the Board of Directors of ATHEXClear with effect as of 3/1/2018.*