Margining methodology

KELER CCP Risk Management

2021

Table of contents

1. Margins for EMIR regulated markets

1.1. Margin types

In accordance with the requirements, only those margin elements are defined that are used to cover the risks arising until the closing of the relevant positions. Calculation always takes place at the end of the day, therefore margin calculation is interpreted for positions not yet closed as at the end of the settlement day.

Intraday margin may be calculated for both spot markets with multinet settlement and derivative markets.

In the multinet market, the margin requirement consists of two parts:

1. **Collateralised price difference:** The result of the theoretical exchange rate loss on open positions calculated on the basis of trading prices and closing prices (negative price difference).
2. **Initial margin:** Value to cover risks expected until the position is closed.

There are two types of margin in the derivatives market:

1. **Price difference:** The result of theoretical exchange rate loss/gain on open positions calculated on the basis of trading prices and settlement prices, which is actually settled.
2. **Initial margin:** Value to cover the risks arising from changes in prices until the position is closed.
    a. For options, a premium margin calculation is applied, which is part of the initial margin.
    b. For option products, the initial margin includes the so-called "Net Liquidation Value" (NLV), which the option buyer is entitled to and reduces the amount of margin (the total margin value can only be reduced to 0).

1.2. Margin calculation frequency

The specified margin values should be reviewed regularly, where all requirements must be met. KELER CCP monitors the amount of margins daily and checks for compliance at least monthly. Typically KELER CCP performs one margin calculation per day, but in the market with multinet settlement, margin may be calculated twice if certain conditions are met. In determining the amount of daily margins, the determination of the liquidation period is a stronger factor than the size of the period between the collections of margins.

1.3. Initial margin calculation parameters

SPAN calculation:

- Futures price scan range
- Volatility scan range
- Other parameters (to be explained under portfolio margining)
    - Spread between trading months (for derivative markets) and spread between settlement days (for multinet markets)
    - Spread between products

The parameters of the SPAN calculation are published by KELER CCP in its announcements.

VaR calculation:

- Lookback period: at least 1 year (250 days), which includes a period of stress
- Confidence level: 99%
- Liquidation period: 2 days
- Procyclicality buffer: 25%
- Tolerance level: 1%
- Decay factor: 98.17% (in case of a lookback period of 250 days)

1.4. Determining the amount of initial margin

When defining margins, we distinguish between leading products and non-leading and illiquid products. Notations used in the margin calculation methodology:

1. $KSzFmargin_t$: VaR value including expert buffer and (il)liquidity buffer
2. $PROmargin_t$: $KSzFmargin_t$ increased by 25% procyclicality buffer
3. $margin_t^{pro-exhaustion}$: value of margin when the procyclicality buffer is exhausted
4. $margin_t^{pro-build\ back}$: value of margin when the procyclicality buffer is built back
5. $MINmargin_t$: current minimum value of the margin
6. $MAXmargin_t$: current maximum value of the margin
7. $margin_t$: actual margin valid for the day
8. $EWMA$: exponentially weighted moving average
9. σ_{EWMA}: exponentially weighted standard deviation
10. σ: equally weighted standard deviation
11. t: time
12. λ: decay factor
13. γ: tolerance level
14. K: length of the lookback period
15. α: confidence level
16. T: liquidation period
17. φ: (il)liquidity buffer parameter
18. θ: expert buffer parameter – fix level
19. π: procyclicality buffer
20. τ: width of margin band, parameter determining the variable level of the expert buffer
21. DP: default buffer parameter
22. NV: nominal value
23. P: price
24. D: duration
25. D^*: modified duration
26. r_t: log return on day t
27. $\bar{r}$: expected value, average of daily log returns

1.4.1. Products of the multinet settlement markets

1.4.1.1. Shares

Leading shares

The following formulas determine the VaR value:

$$VaR_t^{return} = min(\sigma^{equally-weighted} \cdot N^{-1}(99\%); \sigma^{EWMA} \cdot N^{-1}(99\%))$$

$$VaR_t^{price} = -P_t + P_t \cdot e^{\sqrt{T} \cdot VaR_t^{return}}$$

$$KSzFmargin_t = VaR_t^{price} \cdot (1+\theta) \cdot (1+\varphi)$$

$$PROmargin_t = VaR_t^{price} \cdot (1+\theta) \cdot (1+\pi) \cdot (1+\varphi)$$

Where the procyclicality buffer is exhausted, the lower margin limit is "$KSzFmargin_t$", that is, the VaR value increased by the (il)liquidity and expert buffer, while when the procyclicality buffer is not exhausted, then "$PROmargin_t$", that is, the value of "$KSzFmargin_t$" increased by the procyclicality buffer.

$$MINmargin_t = ha\begin{pmatrix} \left(\sigma_{EWMA} \cdot max\left(\frac{margin_{t-1}}{KSzFmargin_t}; 1\right) > \sigma\right); \\ min(max(margin_{t-1}; KSzFmargin_t); PROmargin_t); PROmargin_t \end{pmatrix}$$

KELER CCP aims to keep the margin as stable as possible, and therefore in addition to the basic expert buffer, it determines a variable expert buffer as well, aimed at providing a band (τ), within which the value of the actual margin can move above the minimum required margin. The maximum margin value is determined based on the following formula:

$$MAXmargin_t = MINmargin_t \cdot (1+\tau)$$

The narrower the band between the maximum and the minimum margin, the more often the margin is modified, since as soon as the actual margin would reach the maximum, the "$MAXmargin_t$" becomes the new margin, while if it reaches the minimum, the new margin value will be the "$MINmargin_t$". As long as it does not reach either limit, the margin's value is not modified:

$$margin_t = ha(margin_{t-1} > MAXmargin_t; MAXmargin_t)$$

$$margin_t = ha(margin_{t-1} < MINmargin_t; MINmargin_t)$$

$$margin_t = ha(MAXmargin_t > margin_{t-1} > MINmargin_t; margin_{t-1})$$

Non-leading shares

The margin level for non-leading shares and the application of the procyclicality buffer are as follows:

- Determining the VaR of the price series: the lookback period is essentially 250 days, but if this varies among the leading shares, the longer lookback period must also be applied to non-leading shares.
$$VaR_1 = VaR(250\ days, 99\%, 1\ day)$$
- Determination of 2-day value: % value of VaR multiplied by price value and root(2) (assuming a 2-day holding period).
$$VaR_2 = VaR_1 * \sqrt{2}$$
- Determination of 2-day buffered value: VaR values multiplied by the 25% procyclicality buffer.
$$VaR_{2p} = VaR_2 * (1 + 25\%)$$

IPOs and illiquid shares

In the case of IPOs and illiquid shares, in the absence of historical data, KELER CCP chooses a proxy product based on an expert approach, and the volatility of the data series for this product provides the basis for the margin calculation.

Based on the issue price, the amount of margin will be a simple arithmetic mean of $MINmargin_t$ and $MAXmargin_t$ calculated according to the above methodology applied to the leading shares. However, due to the lack of data, there is a change in the determination of $MINmargin_t$ compared to the basic methodology, and thus the value of $MINmargin_t$ on the first day shall be the value of $PROmargin_t$.

$$MINmargin_1 = PROmargin_1$$

$$margin_1 = \frac{MINmargin_1 + MAXmargin_1}{2}$$

1.4.1.2. Certificates, warrants

Certificates differ from the margin determination methodology applied in the case of shares in that in addition to the risk of changes in the prices of the underlying product, the currency risk must also be taken into account in the case of certificates with non-HUF-based underlying products. KELER CCP takes into account the correlation between the two risks by determining the value at risk from the return calculated on the basis of the price of the underlying product of the certificate expressed in HUF. Another difference in the case of certificates is in the determination of $KSzFmargin_t$, because there is a multiplier for each product, with which the VaR value increased by buffers has to be multiplied, regardless of whether the certificate has a HUF-based or FX-based underlying product.

$$KSzFmargin_t = VaR_t \cdot (1 + \varphi) \cdot (1 + \theta) \cdot multiplier$$

The determination of $MINmargin_t$ differs from the basic methodology in that the value of $MINmargin_t$ is the value of $PROmargin_t$.

$$MINmargin_t = PROmargin_t$$

In the case of a short certificate – if the underlying product is not HUF-based – in order to determine the margin a multiplier called "short/long correction" must also be applied due to the short position.

$$KSzFmargin_t = VaR_t \cdot (1 + \varphi) \cdot (1 + \theta) \cdot multiplier \cdot \left(1 + \frac{short}{long} correction\right)$$

1.4.1.3. Investment units

For investment units, margin is not determined at product level, but as a percentage of the nominal value.

$$margin_t^{inv.unit} = ha(NV \leq 1; 1; NV_t \cdot margin_t^{return})$$

The methodology is based on using risk factors applicable to all investment units that may affect the price of any of the investment units settled. KELER CCP selected the following risk factors to cover the underlying products that underpin most investment units (next to them are the indices underlying the calculations):

- Developed markets shares: MSCI WORLD INDEX
- Emerging market shares: MSCI EMERGING MARKETS INDEX
- Real estate market: MSCI ACWI IMI REAL ESTATE INDEX
- Gold: COMEX (NYMEX) nearest expiration price
- Bonds: Notional zero-coupon bonds calculated from Refinitiv yields for different maturities (O/N; 3 months; 6 months; 1 year; 3 years; 5 years; 10 years; 15 years).

1.4.1.4. Government securities (leading bonds)

In the case of bonds, the risk is the change in the yield or yield curve of the bonds. The relationship between the bond yield (ΔP/P) and the change in the yield curve (Δr) can be indicated as follows, where D* denotes the modified duration:

$$D^* = \frac{\frac{\Delta P}{P}}{\Delta r}$$

In practice, when calculating the duration of bonds, KELER CCP determines D* on the basis of the yield on the notional zero-coupon bonds. Rearranging the formula, the standard deviation is:

$$\sigma_{bond} = \sigma\left(\frac{\Delta P}{P}\right) = D^* \cdot \sigma(\Delta r)$$

The formula can be interpreted as follows: the standard deviation of the yield on a bond is D* times the standard deviation of the change in yield level. Based on these, the VaR is as follows:

$$VaR_{bond}^{return} = N^{-1}(99\%) \cdot \sigma_{bond} = D^* \cdot N^{-1}(99\%) \cdot \sigma(\Delta r) = D^* \cdot VaR_{return}$$

$$VaR_{bond}^{price} = |P_t \cdot VaR_{bond}^{return}|$$

The VaR calculated from the formula is the basis of the margin. From this point on, the method of final determination of the margin is the same as that described for leading shares.

$$KSzFmargin_t = VaR_{bond}^{price} \cdot (1 + \varphi) \cdot (1 + \theta)$$

As the bond market is characterised by not trading a particular product on an ongoing basis, but by many issues and many individual maturities on an ongoing basis, margin is not determined at the product level but by maturity categories within which margin is determined uniformly.

The categories currently used are as follows (in brackets, the maturity point of the yield curve which is the basis for the margin calculation):

- Government securities
  - Discount treasury bill (1 year)
  - Government bonds with a maturity of less than 3 years (3 years)
  - Government bonds with maturity between 3 and 5 years (5 years)
  - Government bonds with a maturity of more than 5 years (15 years)
- HUF corporate bond (5 years)
- EUR corporate bond (5 years)
- USD corporate bond (5 years)
- HUF mortgage bond shorter than 3 years (3 years)
- EUR mortgage bond shorter than 3 years (3 years)
- HUF mortgage bond longer than 3 years (10 years)

1.4.1.5. Corporate bonds and mortgage bonds

In the case of HUF-denominated corporate bonds and mortgage bonds, the calculation procedure differs from the methodology used for government securities in that KELER CCP also takes into account the probability of default (PD) of the bond issuer, which it considers to be a default buffer.

$$KSzFmargin_t = VaR_{bond}^{price} \cdot (1 + \varphi) \cdot (1 + \theta) \cdot (1 + DP)$$

In the case of securities not denominated in HUF, the value at risk must be determined in the currency of the underlying product, however, KELER CCP determines the margin in HUF, so the risk arising from the conversion into HUF must also be taken into account there.

$$KSzFmargin_t = VaR_{bond}^{price\ in\ FX} \cdot e^{VaR_{t,currency}^{return}} \cdot FX\ rate_t \cdot (1+\varphi) \cdot (1+\theta) \cdot (1+DP)$$

1.4.2. BSE derivative market products

If KELER CCP also calculates margin for the underlying product of the particular futures product, KELER CCP uses the price data for the underlying product, and when determining margin, it takes into account the different contract size of the underlying product and the futures product. If KELER CCP does not calculate margin for the underlying product, the log returns calculated from the available closing prices of each maturity of the futures product are concatenated (always using the price of the next maturity on that past day). Apart from this, the methodology is the same as the methodology used for determining margin for leading shares. KELER CCP applies the level of the initial margin determined for each product type equally for each maturity, so the level of the initial margin does not differ from maturity to maturity within a product type.

1.4.3. HUDEX derivative gas market products

The margin calculation is based on reference data series that have been concatenated for each product type from the log returns calculated from the available closing prices of the products with the nearest maturity. From this point on, the calculations are identical to the methodology presented for the leading shares, with the exception that in the $KSzFmargin_t$ formula, VaR_t^{price} is determined by the instrument with the highest contract-level price (*price*contract*), and by P_t we mean contract-level price. KELER CCP applies the level of the initial margin determined for each product type equally for each maturity, so the level of the initial margin does not differ from maturity to maturity within a product type.

1.5. Portfolio margining – spread discounts

The regulation allows KELER CCP to use spread parameters in its margin calculation methodology that result in a reduction of the initial margin calculated at the segregation level for net open positions as part of the portfolio level margin calculation. The extent of these is stated by KELER CCP in its announcements.

There are three types of spread discounts: 1) Spread discount between products, 2) Spread discount between trading months (on the derivatives market), 3) Spread discount between settlement days (on the spot market). The determination of discounts is based on a correlation calculation and certain lower and upper limits must be taken into account.

1. Based on an analysis performed for this purpose, KELER CCP shall only grant spread discounts for products for which the minimum correlation for log returns of 250 days, revised and recalculated at least monthly, reaches or exceeds 0.7.
2. In accordance with Article 27(4) of Regulation (EU) No 153/2013, the spread discount shall not exceed a ceiling of 80%.

The ratio used in the spread discount is based on the size of the margin for each relevant product and not on the price level of each product, that is, in calculating the portfolio margin KELER CCP does not apply the discount rate to the price value but to the margin value.

1.6. Protection against procyclical effects, application of APC measures

For protection against procyclicality, Delegated Regulation 153/2013/EU RTS allows for 3 methods, of which method "a" was chosen by KELER CCP. In this case, the value of the margin is determined with 99% requirement during the monthly review, which is increased by a multiplier of at least 1.25 in normal periods[1]. The procyclicality buffer is exhausted and built back at the product level among the leading index, shares and currencies, and HUDEX/Gas products; at group level for government securities (by maturity category), other bonds and investment units.

Exhaustion of procyclicality buffer *(for marking see Chapter 1.4:* ***Hiba! A hivatkozási forrás nem található****.)*

The procyclicality buffer can be exhausted if the standard deviation calculated by the EWMA method is greater than the equally-weighted standard deviation. The procyclicality buffer is not exhausted all at once. Procyclicality buffer exhaustion is done as follows: the higher of the previous day's margin ($margin_{t-1}$) value and the value without the procyclicality buffer ($KSzFmargin_t$ - which however does include other buffers) is taken, and this will be the basis for the determination of margin:

$$margin_t^{pro-exhaustion} = max(margin_{t-1}; KSzFmargin_t)$$

Building back the procyclicality buffer

The procyclicality buffer is built back gradually by taking the smaller of the $margin_t^{pro-exhaustion}$ and the margin increased by procyclicality buffer ($PROmargin_t$):

$$margin_t^{pro-build\ back} = min\left(margin_t^{pro-exhaustion}; PROmargin_t\right)$$

However, KELER CCP also uses a criterion for the complete buildback of the procyclicality buffer. A partial buildback of the procyclicality buffer instead of a full one is in effect as long as the following condition is met:

$$\sigma_{EWMA} \cdot max\left(\frac{margin_{t-1}}{KSzFmargin_t}; 1\right) > \sigma$$

If this condition is no longer met, the full procyclicality buffer is again included in the margin.

1.6.1. APC measures

The purpose of the next two subsections is to comply with the MNB Recommendation prepared on the basis of the ESMA Directive published on 28 May 2018 (ESMA, 2018) (in Hungarian it was published on 15 April 2019). This Directive encourages all EMIR-authorised central counterparties to develop a methodology for taking into account, measuring and managing the potential procyclical effects of an increase in initial margin. MNB expects the KELER CCP to apply the recommendation from 31 January 2021. Until the relevant function of the new risk management system goes live, KELER CCP will apply the APC methodology in the following categories: leading index, shares and foreign currencies, as well as bonds, HUDEX/Gas products and investment units. Products outside these categories represent only a minimal part of the turnover.

[1] See: Chapter 1.4, Formula $MINmargin_t$discussed for leading shares.

In applying the recommendation[2], KELER CCP interprets the concept of procyclicality in the case of central counterparties as meaning that, in the event of a stress period of increased volatility, a margin increase will result in a further fall in traded market instrument yields and a further increase in volatility. As a result, due to the increased risk, it would be necessary to further increase the margin, thus causing a spiral and deepening the stress period even further, increasing the risk.

The main focus in defining APC ***indicators*** is to measure margin stability and the conservative treatment of procyclicality, as well as compliance with the indicators set out in the ESMA/MNB Directive. Based on these

1) to measure *short-term* stability, **the standard deviation of margin** is applied by KELER CCP: based on 12 months' data, the standard deviation of the log percentage change in the margin, applying equally-weighted standard deviation;
2) to measure *long-term* stability, KELER CCP uses **maximum/minimum ratio of the margin value**: the quotient of the largest and the smallest margins, taking a lookback period of 1 and 3 years, respectively.

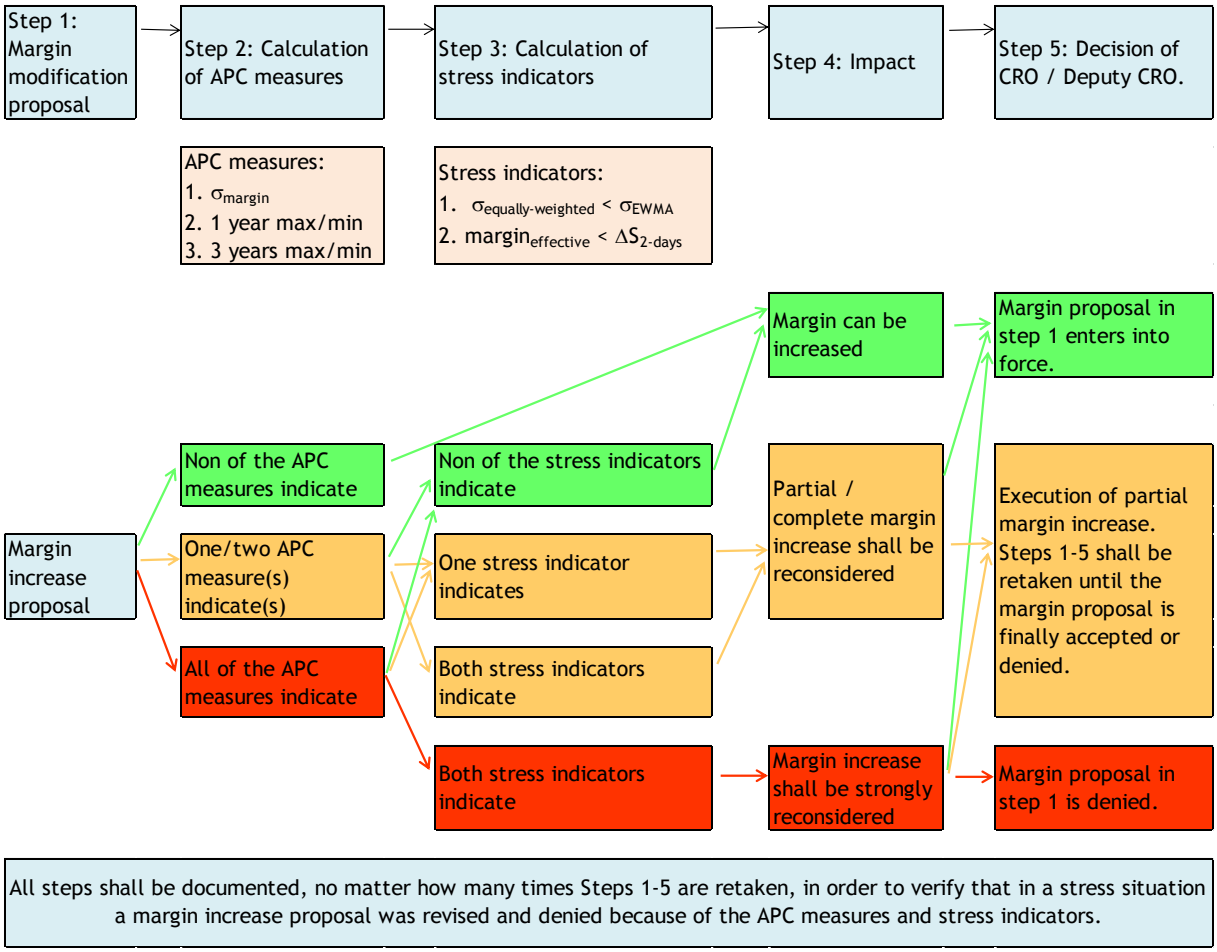
As APC measure these indicators should be used as follows: if an **increase** should occur in the standard deviation AND/OR value of max/min ratio as a result of the **margin increase**, it may indicate that the margin can have a procyclical effect.

In the case of both indicators, it may happen that their value increases in the case of a margin increase in a "calm" (normal) economic environment, thus showing a procyclical effect. However, the purpose of increasing margin in a calm environment is precisely that when a period of stress comes, a buffer should be built into the margin level that can be exhausted and no sudden large margin increases are required. Therefore**, KELER CCP does not take into account indications of APC measures in cases where there is a calm environment** (no period of stress). Stress is determined at the product level (with a few exceptions, detailed later), taking into account two stress ***indicators***:

1) **Based on standard deviations**: if, taking into account a 1-year lookback period, the EWMA standard deviation of the log return of the product exceeds the equally-weighted standard deviation, it may be a more stressful period, so the indications of the APC measure(s) are taken into account, AND/OR
2) **Based on price change**: if the two-day price change of a given product exceeds the value of the applicable margin, the indication of the APC measure(s) is also taken into account in this case.

The following workflow diagram summarises the application of APC measures and the decision process for them:

[2] Recommendation 6/2020 (V.04.) of the Hungarian National Bank (Magyar Nemzeti Bank) on measures for central counterparties regarding EMIR anti-procyclicality margin requirements



Importantly, it is not the value of the APC measure that should be examined, but only the times when the **log change in the APC measure was positive.** This is because the point is that the value of the procyclicality indicator increases. If its value does not change as a result of the margin increase (and possibly even the relation of standard deviations and the price change indicates stress), then we assume that there is no indication from the APC measure.

1.6.2. Product specialties

In line with the margining methodology, KELER CCP follows the principle that for products for which margin calculation is performed at the margin group/product group level, the APC indicators are also calculated at the margin group/product group level.

For bonds and debt securities, the securities are classified into maturity categories, and the APC is calculated based on notional zero-coupon bonds corresponding to the maturity categories.

For investment units, APC measures are managed at the entire product group level, as is margin calculation. As the standard deviations and the margin are determined at the group level, it is not justified to look at the price change at the product level, so in the case of investment units KELER CCP considers only the standard deviation as a stress indicator and makes a decision on the product group based on this.

The ESMA/MNB Directive requires that all risk factors be analysed for procyclicality. This is an important issue for options, as an additional risk factor appears there. In the SPAN system used by KELER CCP, the only parameter whose value may affect procyclicality in the calculation of the portfolio-based margin requirement and which KELER CCP has the possibility to change is the change in standard deviation ($\Delta\sigma$). All other parameters (risk-free return, standard deviation of the return of the underlying product, price of the underlying product, expected maximum price

movement of the underlying product, time to maturity) are given or do not need to be taken into account because their value is constant. KELER CCP has decided that, by default, the value of $\Delta\sigma$ should be the historical maximum standard deviation change. APC measures and stress indications are examined by KELER CCP in respect of the underlying product. If there is no indication from any of these, the value of the change in standard deviation will be increased by 25% (*1.25), and if one of the APC measures indicates while one of the stress indicators also indicates, then the change in standard deviation will only be multiplied by 1, that is, in the case of stress, KELER CCP does not form an additional buffer in its value.

2. Margins for non-EMIR regulated markets

2.1. Balancing Clearing (Information Platform – IP)

Turnover Margin

- Turnover margin: Considered previous period: 12 gas months.
- Percentage rate: 3%.
- Method for calculating the turnover: The effective VAT added value of the buy side imbalance positions. In case of foreign Clearing Members on the Balancing gas market, the value of VAT is 0%.
- Calculating turnover margin is based on the historical data of the value of the cumulated data of the buy side balancing turnover increased with the current value of VAT. In case of foreign Clearing Members the applied value of VAT is 0%.
- Minimum for Balancing Clearing Members: 30,000 EUR.

2.2. Trading Platform (TP)

Turnover Margin

- Turnover margin: Considered previous period: 12 gas months.
- Percentage rate: 3%.
- Method for calculating the turnover: The effective VAT added value of the traded buy side transactions on Trading Platform. In case of foreign Clearing Members on the Trading Platform gas market, the value of VAT is 0%.
- Calculating turnover margin is based on the historical data of the value of the cumulated data of the buy side Trading Platform turnover increased with the current value of VAT. In case of foreign clearing members the applied value of VAT is 0%.
- Minimum for Trading Platform Clearing Members: 0 EUR.

Position limit

$$Position\ limit = \frac{B}{1 + VAT} - T - S$$

where,

- ***B***: value of collateral assets placed for Trading Platform
- ***VAT***: the current value of value-added tax. In this calculation, the value of VAT is 0% for foreign Clearing Members
- ***T***: cumulated financial position based on the transactions which are not yet cleared on Trading Platform (positive = net buyer, negative = net seller)
- ***S***: net financial position based on the transactions which have been already cleared but not yet settled on Trading Platform. Its value is 0 if the position has been settled (positive = net buyer, negative = net seller).

2.3. CEEGEX spot gas market

The calculation of spot margin requirement consists from two parts, the turnover margin and the delivery margin.

$$M_{(t+1)} = max \begin{cases} Min\_value + Round.up\,[M_{delivery(t+1)} * (1 + VAT);\ 0] \\ Round.up\,[(M_{spot(t+1)} + M_{delivery(t+1)}) * (1 + VAT);\ 0] \end{cases}$$

where,

- $M_{(t+1)}$: spot margin requirement
- VAT: the current value of the value-added tax in %, except in case of foreign clearing members, where the value of VAT – in this calculation - is 0 %
- *Round up*: rounding up to one EUR
- The minimum value of the spot margin requirement is 0 EUR

Turnover margin ($M_{turnover}$)

The calculation of the turnover margin is based on the data of the daily net purchase price amount where only positive amounts are taken into consideration (on a 7/7 daily basis).

$$M_{turnover_{t+1}} = Min(L_{average}{}_{t+1} * E; Cap_{t+1})$$

where,

Short average: $S_{average}{}_{t} = Average\_if\,[(SN)_{[t-d1]}; > 0]$

where,

- **d1 = 14** – number of the days of the short lookback period
- SN: net purchase price amount (on a 7/7 daily basis)

Long average: $L_{average}{}_{t} = Average\_if\,[(SN)_{[t-d2]} \geq : S_{average}{}_{t}$

where,

- **d2 = 365** - number of the days of the long lookback period
- SN: net purchase price amount (on a 7/7 daily basis)

Lookahead period (E): number of the days that remains until the next settlement day.

where,

- Monday, Tuesday, Wednesday, Friday: 2,
- Thursday: 3,
- on holiday weekends the parameter could differ, and be bigger than 3

Cap: $Cap_{t+1} = Max(TN)_{[t-d3]}$

where,

- **d3 = 60** - number of the days of the lookback period
- TN: daily settlement net purchase price amount

Delivery Margin ($M_{delivery(t+1)}$)

In case of products that are in the delivery cycle, the calculation is based on the daily delivery payments. The delivery margin is provided by the buyer.

$$M_{delivery_{t+1}} = (D_{t+1} + D_{t+2}) * H$$

where,

- t: date of the calculation
- D: payment amount
- H = N/2+1, where N equals the number of non settlement days between t and t+2 settlement days

Position limit

$$Position\ limit = \frac{B}{1 + VAT} - T - S$$

where,

- ***B***: value of collateral assets placed for CEEGEX
- ***VAT***: the current value of value-added tax. In this calculation, the value of VAT is 0% for foreign Clearing Members
- ***T***: cumulated financial position based on the transactions which are not yet cleared on CEEGEX (positive = net buyer, negative = net seller)
- ***S***: net financial position based on the transactions which have been already cleared but not yet settled on CEEGEX. Its value is 0 if the position has been settled (positive = net buyer, negative = net seller).