COMMODITY DERIVATIVES RISK ENGINE

Mark-to-market/Variation Margins

Methodological notes

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1   Introduction

The purpose of this document is to describe the steps methodology for computing the *Mark-to-market/Variation Margins* (i.e. 'deterministic margins') for the Clearing Member's portfolio subject to margining.

The employed convention of subtracting long positions from short positions (S - L) to obtain net positions is aimed at expressing margin debts as positive quantities and margin credits as negative quantities.

2 Labelling of positions

The positions/contracts which form a Clearing Member's portfolio must be labelled based on their type, and in some cases also expiry date. The 'clusters' of the so-identified positions/contracts are:

- 1st sub-portfolio (SUB1):
  - *Options*;
  - Cash-settled *futures*;
  - Unexpired physically-delivered *futures* with difference in business days between expiry date T and margin date t (T-t) greater or equal than SUB
- 2nd sub-portfolio (SUB2):
  - Unexpired physically-delivered *futures* with difference in business days between expiry date T and margin date t (T-t) less than SUB
- 3rd sub-portfolio (SUB3):
  - Expired physically-delivered *futures* (from end of expiry date onwards)

Here below is an example of *SUB* parameter for physically-delivered *futures* (T-t) difference:

Table 1 – Boundary for allocating unexpired physically-delivered *futures*

SUB
HP

with: *HP*: chosen *holding period* (model parameter – please refer to the relevant document).

3   *Futures*

3.1   Open *futures: Variation Margins*

Open *futures* positions are subject to daily marking-to-market in the time span between the trade date and the expiry date (included), through the payment/receipt of the differential between the daily close price of the evaluation day and the trade price for open positions arising from the trading activity of that same day, or the close price of the evaluation day and the close price of the previous business day for open positions arising from previous business days' trading activity. These margins are called *Variation Margins* and are liquidated to Clearing Members:

1) $Variation\_Margins = (Futures\_close\_price - Futures\_trade\_price) * Net\_position * Multiplier$

for positions arising from the trading activity of that same day, or

2) $Variation\_Margins = (Futures\_close\_price - Previous\_futures\_close\_price) * Net\_position * Multiplier$

for positions arising from previous business days' trading activity,

where:

3) $Net\_position = Short\_contract\_quantity - Long\_contract\_quantity$.

4 Options

4.1 Open *options: Mark-to-market (a.k.a. Premium) Margins*

The *Mark-to-market Margins* for *option* positions are also called *Premium Margins* and cover the cost of liquidating *options* at current market prices (equity-style *options*).

Premium Margins are a credit for the holder of the long position as they represent the proceeds from selling the long position if it were liquidated at the current market price. On the other hand, they are a debt for the holder of the short position as they represent the cost to buy back the short position if, likewise, it were to be liquidated at the current market price.

For each open *option* position the *Premium Margins* are calculated from trade date potentially up to expiry date (included) as follows:

4) $Premium\_Margins = Option\_close\_price * Net\_position * Multiplier,$

where:

5) $Net\_position = Short\_contract\_quantity - Long\_contract\_quantity.$

5   FX conversion

All *Mark-to-market Margins* calculated this way are expressed in product (i.e. denomination, trading) currency.

The conversion to the relevant clearing (i.e. margin) currency(ies) is performed employing the current, appropriate FX rate(s):

$$CC_{xxx}Margins = PCMargins * FX_{PC/CC_{xxx},current},$$

with:

- $CC_{xxx}Margins$: margins expressed in clearing currency *xxx*;
- $PCMargins$: margins expressed in product currency;
- $FX_{PC/CC_{xxx},current}$: current product/clearing currency FX rate.

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