



**CC&G**

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## **FIXED INCOME RISK ENGINE**

*Final Margins*

*Methodological notes*

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## 1 Introduction

The scope of this module is to retrieve the *Total Margins* requirement to Clearing Members, obtained once all the various margin components described in the other modules have been computed.

In particular, the following margin components are required in order to define the *Total Margins* requirement:

- 1) *Mark-to-Market Margins – MtM*;
- 2) *Expected Shortfall, unscaled and scaled – U-ES and S-ES*;
- 3) *Decorrelation add-on, unscaled and scaled – U-DECO and S-DECO*;
- 4) *Idiosyncratic-concentration add-on – IDIO*;
- 5) *Repo-concentration add-on – REPO*;
- 6) *Settlement add-on – SETTLE*,

plus margins computed on portfolios of positions outside the scope of the *Fixed Income* margin model enhancement (therefore, different from Italian, Spanish, Portuguese and Irish government bonds), which we will call ‘*corporate*’ – *CORP*.

## 2 *Total Margins* requirement computation

The *Total Margins* (TM) requirement for a given *sovereign* portfolio configuration  $s$  (please refer to *Settlement risk add-on* module in order to understand the different configurations) is given by:

$$(1) TM_s = \sum_i \max(\max(U-ES_{s,i} + U-DECO_{s,i}; S-ES_{s,i} + S-DECO_{s,i}) + IDIO_{s,i} + REPO_{s,i} - MtM_{s,i}; 0)$$

with all debt components (+) except for *MtM*, which can be a credit (+) or a debt (-), and with  $i \in [Italy, Spain, Ireland, Portugal]$ .

In particular,

$$(2) IM_{s,i} = \max(U-ES_{s,i} + U-DECO_{s,i}; S-ES_{s,i} + S-DECO_{s,i}) + IDIO_{s,i} + REPO_{s,i}$$

are the what-if *Initial Margins* component, inclusive of 3 of the 4 *add-ons*.

It is important to notice that the maximum between the *unscaled Expected Shortfall* and the *scaled Expected Shortfall* is taken, as the latter alone would potentially result in pro-cyclical margin requirements, while the former alone would not be able to capture periods of high volatility on the markets. Therefore, the *unscaled Expected Shortfall* works as a floor to the *Expected Shortfall* component.

Considering also

$$(3) TM\_CORP_s = \max(IM_s - MtM_s; 0)$$

as the margin requirement for a given *corporate* portfolios (with *IM* debt – computed according to SPAN-like methodology, and *MtM* credit/debt),

the *Total Margins* requirement for a given Clearing Member's portfolio is given by:

$$(4) TM = \max_s(TM_s - TM\_CORP_s)$$

with  $s \in [current\ portfolio\ configuration, t+1\ portfolio\ configuration]$ .

In this sense, the 4<sup>th</sup> *add-on*, the *Settlement risk* one, can be viewed as the potential positive delta between  $t+1$  *portfolio configuration Total Margins* and *current portfolio configuration Total Margins*.

The *Total Margins* requirement can only be a debt to a Clearing Member, meaning that whenever *Mark-to-Market Margins* are greater than what-if components *Total Margins* are set at 0.