



EQUITIES & EQUITY DERIVATIVES RISK ENGINE

Module 0: Model parameters

Methodological notes

Table of contents

1. Core model parameters / assumptions 3

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The following table summarizes the parameters / assumptions used in the Core margining model:

Table 1: parameters / assumptions

Risk measure	<i>Historical simulation Expected Shortfall (Ordinary/Stressed)</i>
Weights applied to Ordinary and Stressed ES	<i>Ordinary ES: 75%</i> <i>Stressed ES: 25%</i>
Holding period	<i>3 business days</i>
Confidence level	<i>99.8%</i>
Lookback period	<i>Ordinary ES: 5 years, rolling, most recent</i> <i>Stressed ES: stressed periods, non-rolling (currently comprising 114 stress events)</i>
Tail approach	<i>Single tail</i>
Weighting of tail events	<i>Equal weighting</i>
Scaling window (seed volatility calculation)	<i>60 days</i> <i>(Ordinary ES only)</i>
λ	<i>98%</i> <i>(Ordinary ES only)</i>
Cross margining	<i>Applied</i>

Risk Measure

The *Expected Shortfall* is the chosen risk measure. Given the distribution of gains/losses of the variations computed over a specific time series, it represents the weighted average of the observations that lie on the tail/s. By definition, it represents a more conservative risk measure with respect to pure VaRs methodologies.

Weights applied to Ordinary and Stressed ES

The initial margins are computed as the maximum between a linear combination of stressed ES (25%) and 'ordinary' ES (75%) amounts and the 'ordinary' ES amount itself.

Holding period

Holding period is 3 days. Given a holding period n , only the n -days variation is considered in the computation of the Expected Shortfall.

Confidence level

Confidence level is 99.8% for both the scaled ordinary ES and the unscaled stressed ES.

Lookback period

The lookback period for the scaled ordinary ES is 5 years.

The unscaled stressed ES is based on a dynamic array of historical stressed events deemed as significant for margining purposes. At the moment, the stressed array comprises 114 events coming from the Sovereign debt crises, Brexit, Covid-19 and the Russian-Ukrainian war. Stressed events have been identified at first by means of a 3-days absolute variation threshold amounting to 5%¹. The stressed array is then enriched on the basis of expert judgment by taking into account further events included in the highly volatile periods mentioned above. When a new significant event is witnessed, this may be included as well into the stressed lookback period once the anti pro-cyclical provisions set out by the CCP are deemed to be satisfied (i.e., the inclusion of the considered event into the stressed lookback period should not result in pro-cyclical behaviour of the model).

Given the aforementioned 99.8% confidence level, the number of extreme events defining the tails of the distributions is of 2 events for the ordinary ES and 1 event for the stressed ES.

Tail/s approach

The single tail approach has been chosen. It means that only the distribution tail of the losses is taken into consideration. This choice is coherent with the sign of the marginable position.

¹ Such 5% threshold has been empirically identified as a good indicator to trigger the passage from ordinary to stressed events.

Scaling window, λ

In order to compute the *Scaled Expected Shortfall* a seeding volatility must be defined at first. The seeding volatility window (also scaling window) is defined in 60 business days. The λ parameter of 98% is calibrated in order to balance the model reactivity to market volatility and the satisfaction of the anti-procyclicality concern. In particular, the calibration process related to the λ factor has highlighted the necessity of focusing on the higher end of the spectrum of the possible values. In fact, higher values of λ could allow for the constitution of margin buffers to be used pre and post periods of high volatility and to be exhausted during such stressed market periods, overall resulting in less volatile margin requirements and potentially higher coverage.

Cross margining

Cross margining between different products / instrument types is applied. The ES methodology developed is based upon an integrated full re-evaluation of margined portfolios.

In any case, Euronext Clearing gives its Members the option to margin separately cash and derivatives positions.