EBA EUROPEAN BANKING AUTHORITY

Public Hearing on CP on draft RTS on Stress Scenario Risk Measure

03 July 2020

Recent cycle of EBA regulatory products under market risk

EBA published roadmap on new market and counterparty credit risk approaches along with 3 CPs on 11 draft RTS* on the IMA under the FRTB
-
27/06/2019

16/10/2019
-
EBA published CP on GLs on the treatment of Structural FX positions

EBA published CP on draft RTS on treatment of FX and COM risk in the BB under the FRTB framework
-
13/01/2020

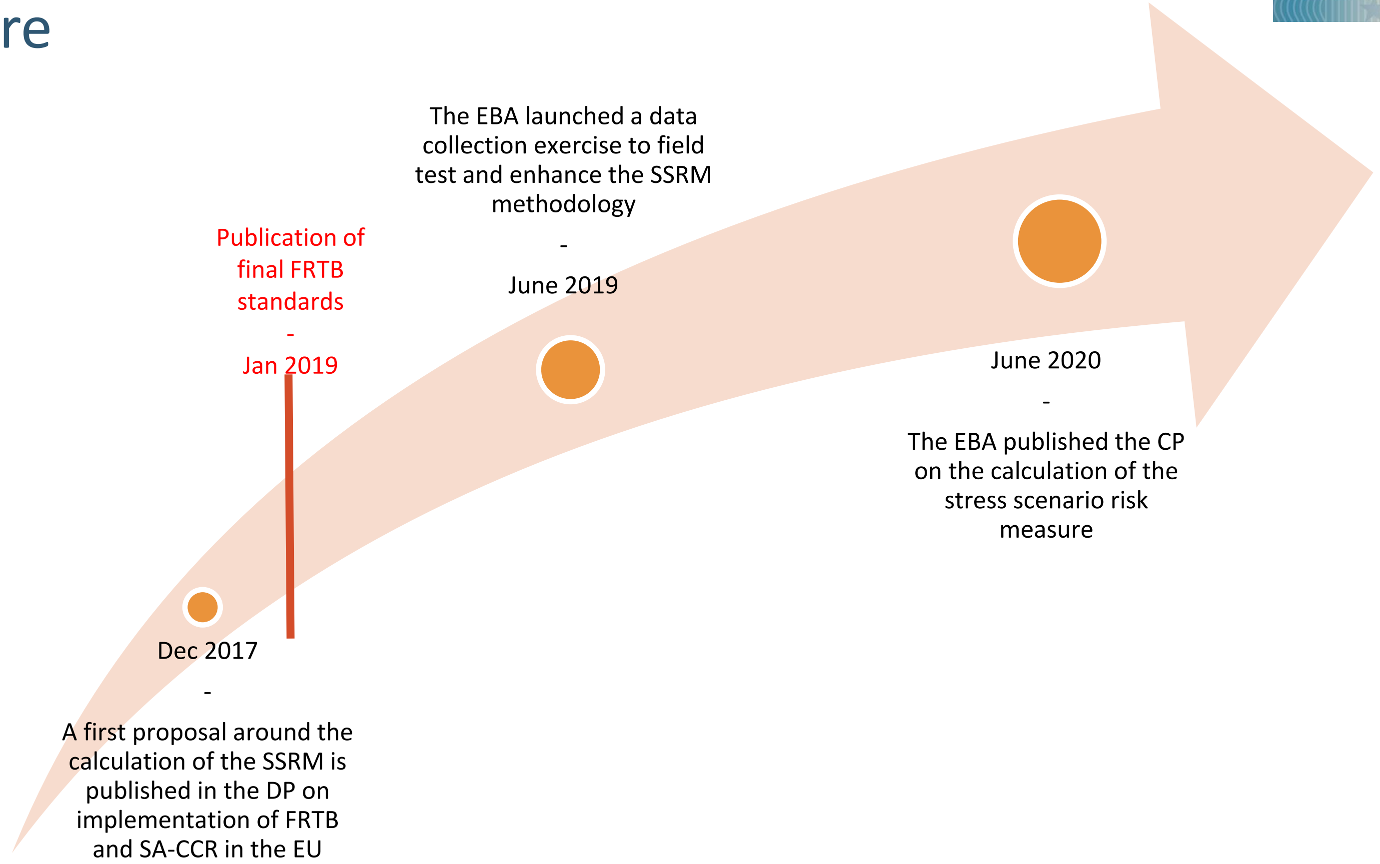
27/03/2020
-
EBA published 11 final draft RTS* on the IMA under the FRTB

EBA published CP on draft RTS on the calculation of the stress scenario risk measure
-
04/06/2020

01-07-2020
-
EBA published final guidelines on Structural FX

* Draft RTS on liquidity horizon, Backtesting and PLA requirements, risk-factor modellability

CP on draft RTS on the calculation of the stress scenario risk measure



The CRR mandates for these draft RTS

Article 325 bk(3) of the CRR requires the EBA to develop draft RTS to specify:

a) how institutions are to develop extreme scenarios of future shock applicable to non-modellable risk factors;

b) a regulatory extreme scenario which institutions may use when they are unable to develop an extreme scenario of future shock in accordance with point (a) or which competent authorities may require that institution apply;

c) the circumstances under which institutions may calculate a stress scenario risk measure for more than one non-modellable risk factor;

d) how institutions are to aggregate the stress scenario risk measures of all non-modellable risk factors.

Structure of the presentation

1. Introduction of the two overarching approaches included in the CP
2. Option A: a more detailed overview
   - Determination extreme scenario of future shock for a single RF
     - Direct method
     - Stepwise method
   - Extending the framework to the bucket case
   - How the stress period is identified
3. Option B: what are the differences with respect to option A?
4. Regulatory extreme scenario of future shock
5. Aggregation of Stress Scenario Risk Measures
   - Non-linearity correction coefficient κ

Only one of the two will be kept in the final draft RTS

1. Introduction of the two overarching approaches included in the CP

Option A: determination of the SSRM directly from the stress period

- The institution determines the stress period for each risk class
- The institution obtains the extreme scenario of future shock calibrating it on the stress period

Option B: rescaling a shock calibrated on the current period to obtain a shock calibrated on the stress period

- The institution determines the stress period for each risk class
- The institution determines shocks calibrated to data observed in the current period
- The institution rescales those shocks by means of a scalar calibrated on MRFs only. The rescaling is made to obtain shocks on a stress period

Q1. What is your preferred option among option A and option B? Please elaborate highlighting pros and cons.

Q2. What are characteristics of the data available for NMRF in the data observation periods under options A and B?

2. Option A: a more detailed overview

Goal: Determining a shock leading to a loss calibrated to a 97.5% confidence threshold over a period of stress

For consistency with the ES, a SSRM is determined on a 10d horizon and then rescaled to reflect the LH of the NMRF

Option A: observation period = stress period

↓

First step: determining a time series of 10 business days returns on the stress period

First step: time series of 10 business days returns:

1. Obtain RFs observations in the observation period (i.e. stress period in option A)
2. Each observation corresponds to a date. For each of those dates D_t, the 10 business days (or nearest) forward date $D_{t'}$ is identified by minimising:

$$\left|\frac{10 \text{ days}}{D_{t'} - D_t} - 1\right|$$

- D_t lies in the stress period, $D_{t'}$ may lie also in the 20 business days following the stress period

3. The return on the period $[D_t, D_{t'}]$ is rescaled to obtain a return on a 10 day period

Q5. What are your views on how institutions are required to build the time series of 10 business days returns? Please elaborate.

Second step: obtain the extreme shock

The direct method

1. Determine the expected shortfall of the losses $\widehat{\mathrm{ES}}_{\mathrm{Right}}\left[loss_{D^*}\left(r_j(D^*) \oplus Ret(r_j, t, 10)\right), \alpha\right]$

2. The extreme shock is the shock leading to a loss equal to that expected shortfall*

Drawbacks:
- Need of data
- Computationally very burdensome

Q3. Do you think that institutions will actually apply the direct method or do you think that given the computational efforts it will not be used in practice?

*Uncertainty in the estimation is captured in the aggregation of SSRMs

The stepwise method

1. Determination of upward and downward shock: $CS_{\text{up}}(r_j)$, $CS_{\text{down}}(r_j)$

2. Calculate a loss on a grid of 4 points (-100%, -80%, 80%, 100%):

$$Grid = \left\{ r_j(D^*) \ominus i \times \frac{CS_{\text{down}}(r_j)}{5}, r_j(D^*) \oplus i \times \frac{CS_{\text{up}}(r_j)}{5} \mid i = 4, 5 \right\}$$

3. Extreme shock is the one corresponding to worst loss in the grid

⟹ Thus, SSRM = Loss(ES(r_j))

FRTB set out that the capital charge for a NMRF must be at least as conservative as ES(loss(r_j))

If the loss function is convex, setting SSRM = loss(ES(r_j)) may not lead to a sufficient capitalisation (i.e. at least equal to ES(loss(r_j))) of the non-modelled risk

non-linearity captured with coefficient κ in the aggregation formula

How are $CS_{\mathrm{up}}(r_j)$, $CS_{\mathrm{down}}(r_j)$ determined?

Historical method: $\widehat{\mathrm{ES}}_{\mathrm{Left/right}}(Ret) \cdot \left(1 + \frac{C_{UC}}{\sqrt{2(N-1.5)}}\right)$

To capture statistical estimation error, parameter choice uncertainty and uncertainty due to lower market observability.

C_{UC} = 1.28 , i.e. $\Phi^{-1}(90\%)$

Sigma method: $C_{ES} \cdot \hat{\sigma}(Ret) \cdot \left(1 + \frac{C_{UC}}{\sqrt{2(N-1.5)}}\right)$

Rescale a volatility measure to approximate a ES measure.

C_{ES}= 3

Asymmetrical sigma method: $\left(|\hat{\mu}_{Ret \le m}| + C_{ES} \cdot \sqrt{\frac{1}{N_{\mathrm{down}}-1.5} \times \sum^{N}_{\substack{i=1, \\ Ret_{(i)} \le m}} \left(Ret_{(i)} - \hat{\mu}_{Ret \le m}\right)^2}\right) \cdot \left(1 + \frac{C_{UC}}{\sqrt{2(N_{\mathrm{down}}-1.5)}}\right)$

Q6. What is your preferred option among (i) the sigma method and (ii) the asymmetrical sigma method for determining the downward and upward calibrated shocks? In addition, do you think that in the asymmetrical sigma method, returns should be split at the median or at another point (e.g. at the mean, or at zero)?

Q7. What are your views on the value taken by the constant C_{ES} for scaling a standard deviation measure to approximate an expected shortfall measure?

Q8. What are your views on the uncertainty compensation factor $\left(1 + \frac{C_{UC}}{\sqrt{2(N-1.5)}}\right)$?

Fallback method for very sparse data

The historical and the (asymmetrical) sigma method can be used where $N \geq 200$ and where $N \geq 12$ respectively. Where $N < 12$ the fallback method applies*.

Fallback method:

- If the NMRF is a Sensitivity-based Method (SbM) RF, the shocks are RW $\cdot$ 1.3 $\cdot \sqrt{\frac{10}{LH(j)}}$
- If the NMRF is not a SbM RF, banks are to select a RF and calibrate a shocks for that selected RF

$$CS_{down/up}(r_{original}) = CS_{down/up}(r_{other}) * 2/\left(1 + \frac{c_{UC}}{\sqrt{2(N_{other} - 1.5)}}\right)$$

Conditions for the selected RF:

- Be of the same category and subcategory of the NMRF + be of the same nature of the NMRF
- Shall not underestimate the volatility of the original RF
- 12 returns must be available in the stress period

Q9/10. What are your views on the fallback method that is envisaged for risk factors that are/are not included in the sensitivity-based method? Please elaborate.

Q11. What are your views on the conditions that the 'selected risk factor' must meet under the 'other risk factor' method? What would be other conditions ensuring that a shock generated by means of the selected risk factor is accurate and prudent for the corresponding non-modellable risk factor?

*N is the number of returns in the time series of 10 business days returns

Extending the framework to the bucket case

Direct method: it is naturally extended to the bucket case by calculating the losses at bucket level. The ES of those losses is estimated with the usual estimator.

Stepwise method:

Representative RF option: (i) shocks for each RF are calibrated using the methodology at RF level, (ii) a 'representative' RF is identified, (iii) parallel shifts are applied on the basis of the shocks determined for the representative RF. The 'worst' parallel shift is the extreme scenario. Non-linearity correction to be calculated.

Contoured shift option: (i) shocks for each RF are calibrated using the methodology at RF level, (ii) each of those shocks is weighted for a 'strength' parameter and applied simultaneously to the corresponding RF. The worst contoured shift is the extreme scenario. Non-linearity correction to be calculated.

Q4. What is your preferred option among (i) the representative risk factor – parallel shift option, and (ii) the contoured shift option? Please elaborate highlighting pros and cons.

How the stress period is identified?

Under option A, institutions are to identify the stress period for a risk class by finding the period maximizing the 'rescaled SSRMs' for RFs mapped to that risk class:

$$S^{i} = \underset{P}{argmax}\left[\sum_{j \in i} RSS_{D^*}^{j,P}\right]$$

Q12. What are your views on the definition of stress period under option A (i.e. the period maximizing the rescaled stress scenario risk measures for risk factors belonging to the same broad risk factor category)? What would be an alternative proposal?

3. Option B: what are the differences with respect to option A?

- Observation period = last 12 months period*
- No direct method
- Shocks are calibrated on the current period and rescaled to reflect the conditions during the stress period. The scalar is:

$$m_{S,C}^{i} = \underset{j \in i}{\text{trimmed\_mean}_{0.01}} \left[\frac{\hat{\sigma}^{S}{}_{Ret(j)}}{\hat{\sigma}^{C}{}_{Ret(j)}} \right]$$

$j \in Reduced\ Set\ of\ RFs\ in\ ES$ ← No need of NMRF data in the stress period

- Stress period = Period P maximising the scalar $m_{P,C}^{i}$
- Fallback method foresees the possibility to change the period in which at least 12 returns are to be found ('change in the period' option)

Q19. Do you agree with the definition of the rescaling factor $m_{S,C}^{i}$? Please elaborate.

Q20. The scalar $m_{S,C}^{i}$ is obtained by using data related to modellable risk-factors in a specific risk class. As a result, such a scalar is not defined where an institution does not have any modellable risk factor in this risk class. How do you think the scalar $m_{S,C}^{i}$ should be determined in those cases? Please elaborate.

*possibly shifted by up to 1 month

Non-pricing scenarios

- There could be cases where the scenarios generated following the methodology in the draft RTS may lead the pricers to not provide a meaningful result
- These non-pricing scenarios are not ‘non-pricing’ per se; usually, they are ‘non pricing’ in the context of certain products (or even pricers)
- The EBA aims at addressing this specific issue in the final draft RTS

Q14. How do you currently treat non-pricing scenarios if they occur where computing the VaR measures? How do you envisage implementing them in (i) the IMA ES model and (ii) the SSRM, in particular in the case of curves and surfaces being partly shocked? What do you think should be included in these RTS to address this issue?

The EBA considers practices according to which the loss corresponding to a non-pricing scenario is set to zero, capped or discarded as inappropriate, and seeks for potential solutions that would address the issue only where it occurs (i.e. solutions that would target the specific product for which the scenario is a “non-pricing” one, rather than global measures that would impact also instruments for which the scenario is not ‘non-pricing”).

4. Regulatory extreme scenario of future shock based on the maximum loss

EBA EUROPEAN BANKING AUTHORITY

⟹ Regulatory extreme scenario = scenario leading to maximum loss

↓ In line with the FRTB standards

↓ Where not finite (e.g. stock short position), the bank must identify identify a loss that cannot be exceeded in the 99.95% of the cases on a 10 business day horizon.

Q13. What are your views on the definition of maximum loss that has been included in these draft RTS? What would be an alternative proposal?

5. Aggregation of SSRMs

- Non-linearity of the loss function is captured if the bank used the stepwise method
- SSRM rescaled to reflect the LH of the NMRF (LH floored at 20 days)
- Aggregation formula in line with FRTB standards

Requires the identification of NMRFs that are idiosyncratic equity/CS risk factors

(a) the nature of the risk factor is such that it reflects idiosyncratic equity/CS risk only;
(b) the value taken by the risk factor is not driven by systematic risk components;
(c) the institution performs (and documents) statistical tests to verify the condition in point (b);

Q15. What are your views on the conditions included in these draft RTS for identifying whether a risk factor can be classified as reflecting idiosyncratic credit spread risk only (resp. idiosyncratic equity risk only)?

Non-linearity correction coefficient κ

- If the extreme scenario is not $CS_{\mathrm{up}}(r_j)$ or $CS_{\mathrm{down}}(r_j)$: $\kappa = 1$
- If the extreme scenario is $CS_{\mathrm{up}}(r_j)$ or $CS_{\mathrm{down}}(r_j)$: $\kappa = \max\left[\kappa_{min}, 1 + \frac{\mathrm{loss}_{-1} - 2 \times \mathrm{loss}_0 + \mathrm{loss}_{+1}}{2 \times \mathrm{loss}_0} \times (\phi - 1) \times 25\right]$

Set to 0.9 (κ_{min})

Tail parameter (ϕ)

- At bucket level:
  - Under the representative RF option, ϕ is calculated on the basis of the representative RF
  - Under the contoured shift option, ϕ is the average of the tail parameters of the RFs in the bucket

Q16. What are your views on flooring the value taken by non-linearity coefficient κ to 0.9?
Q17. What are your views on the definition of the tail parameter where a contoured shift is applied (i.e. average of the tail parameters of all risk factors within the regulatory bucket)?
Q18. Would you consider it beneficial to set the tail parameter ϕ to the constant value 1.04 regardless of the methodology used to determine the downward and upward calibrated shock?

EUROPEAN BANKING AUTHORITY

Floors 24-27, 20 Av André Prothin, 92927 Paris La Défense

Tel: +33 1 86 52 7000

E-mail: info@eba.europa.eu

http://www.eba.europa.eu