

FUNDAMENTAL REVIEW OF THE TRADING BOOK



DEMYSTIFYING THE REVISED
STANDARDISED APPROACH

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Yered Fandohan © - Fundamental Review of the Trading Book
Revised Standardised Approach

IMPACT OF FRTB FRAMEWORK



Reshaped the Standardised Approach



Making it significantly more risk-sensitive.



Capital requirements reporting on a **monthly basis**

STANDARDISED APPROACH – CAPITAL REQUIREMENT (K)

**Sensitivities-Based
Method (SBM)**

**Default Risk Charge
(DRC)**

**Residual Risk Add-On
(RRAO)**

$$\text{Capital FRTB – Standardised Approach} = \underbrace{(K_{\Delta} + K_{\text{Vega}} + K_{\text{Curvature}})}_{\text{SBM}} + \underbrace{\sum RW_i \cdot JTD_i}_{\text{DRC}} + \underbrace{\sum \alpha_k \cdot \text{Notional}_k}_{\text{RRAO}}$$

SENSITIVITIES BASED METHOD (SBM) – 7 RISK CLASSES



General Interest Rate Risk (GIRR)



Credit Spread Risk (CSR) – Non-Securitisation



Credit Spread Risk (CSR) – Securitisation (Non-Correlation Trading Portfolio)



Credit Spread Risk (CSR) – Correlation Trading Portfolio (CTP)



Equity Risk

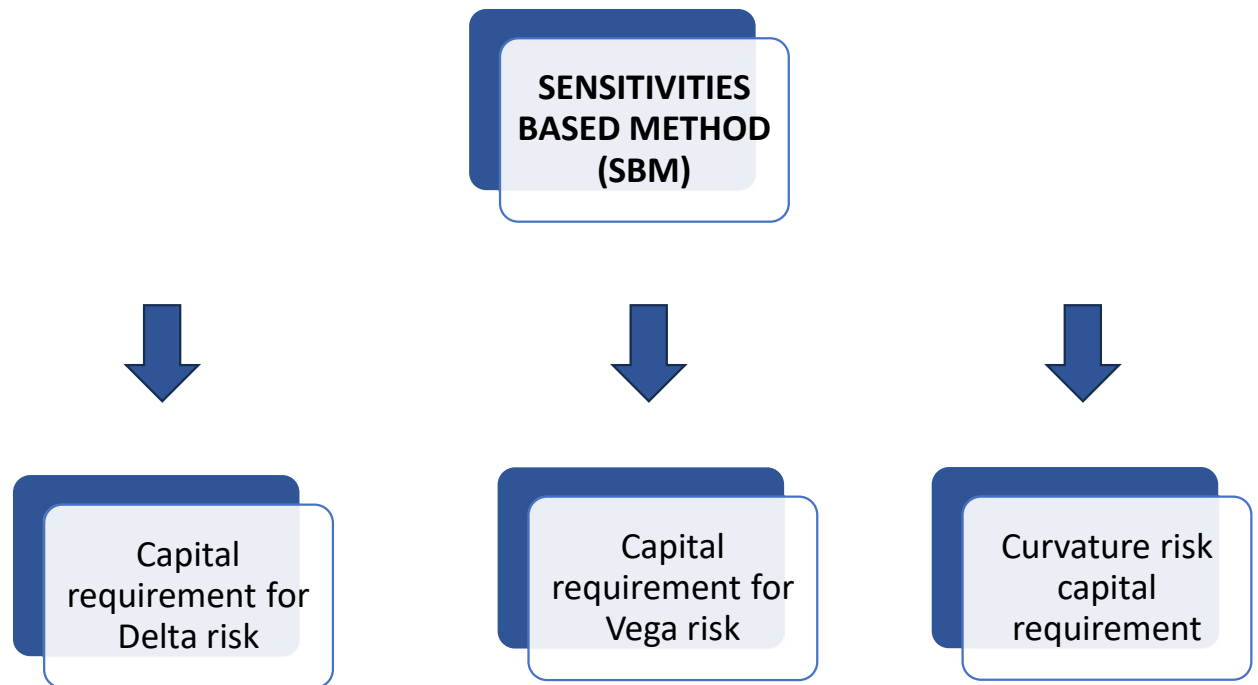


Commodity Risk



Foreign Exchange (FX) Risk

SENSITIVITIES BASED METHOD (SBM)



SENSITIVITIES BASED METHOD (SBM) – DELTA (δ) RISK CAPITAL REQUIREMENT



Delta (δ) risk capital, capturing the risk of changes in an instrument's value driven by non-volatility risk factors (interest rates, indices, underlyings products or instruments, etc.).



Example



Sensitivity of a bond to changes in interest rates constitutes delta risk.



Beta of an equity represents delta risk with respect to movements in the equity index.



Delta of an option represents delta risk arising from changes in the price of the underlying asset

EXAMPLE

CALCULATION OF THE DELTA RISK CAPITAL REQUIREMENT FOR GENERAL INTEREST RATE RISK (GIRR)

For General Interest Rate Risk (GIRR), the Standardised Approach considers **three risk factors** :

- ☐ The risk-free interest rate
- ☐ Inflation risk
- ☐ Cross-currency basis risk

Sensitivities are weighted using the following w_i coefficients, depending on the **maturity** of the instrument:

- *0,25 – 0,5 year : 2,4%*
- *1 year : 2,25%*
- *2 years : 1,88%*
- *3 years : 1,73%*
- *5, 10, 20, 30 years : 1,5%*

Short term rates are more volatiles than long term rates.

CALCULATION OF THE DELTA RISK CAPITAL REQUIREMENT FOR GENERAL INTEREST RATE RISK (GIRR)

In this case, the risk factor considered is the risk-free interest rate.

Instruments	Positions	Interest Rate Sensitivity	Individual Position Sensitivity	Maturities	Weighting	Weighted Sensitivities	Capital Requirements
A	600 000	0,4	240 000	0,25	2,40%	5 760	
B	-150 000	0,2	-30 000	0,5	2,40%	-720	
C	30 000	1,7	51 000	2	1,88%	959	
D	-80 000	2,4	-192 000	3	1,73%	-3 322	
E	60 000	3,2	192 000	10	1,50%	2 880	
F	-20 000	4,3	-86 000	20	1,50%	-1 290	
Correlation between i and j maturities	$\max [\exp (-3\% * \text{abs} (i - j) / \min (i ; j)); 40\%]$						
Squared capital requirement	$K^2 = (\text{sum of weighted sensitivities})^2 + \text{sum of (weighted sensitivity i x weighted sensitivity j x correlation } \rho_{i,j})$						16 496 074,29
Capital requirement	$K = \text{square root of (E), i.e. } E^{0,5}$						4 061,54

CALCULATION OF THE DELTA RISK CAPITAL REQUIREMENT FOR GENERAL INTEREST RATE RISK (GIRR)

STEPS

Step 1 – Construction of the Correlation Matrix between i & j

Formula - calculation of the correlation coefficient (*BCBS 457*)

$$\rho(i, j) = \max \left(\exp \left(-3\% \times \frac{|i - j|}{\min(i, j)} \right), 40\% \right)$$

Step 2 – Construction of the Capital Contribution Matrix

Formula calculation of capital contribution for each pair

$$\text{Contribution}_{i,j} = W S_i \times W S_j \times \rho(i, j)$$

i, j : Indices referring to individual risk factor sensitivities

S_i : raw sensitivity to risk factor i

w_i : regulatory risk weight applied to sensitivity

$\rho_{i,j}$: Regulatory correlation parameter between risk factors i & j , specified by the FRTB Standardised Approach

CALCULATION OF THE DELTA RISK CAPITAL REQUIREMENT FOR GENERAL INTEREST RATE RISK (GIRR)

STEPS

Step 3 – Calculation of the Capital Requirement

- ➡ Squared capital requirement $K^2 = \sum_i \sum_j W S_i W S_j \rho(i, j)$
- ➡ Capital requirement $K = \sqrt{\max(K^2, 0)}$

SENSITIVITIES BASED METHOD – VEGA RISK CAPITAL

Vega risk capital (v)



Risk arising from changes in volatility.

$$K_{\text{Vega}} = \sqrt{\sum_i \sum_j W S_i^{\text{Vega}} W S_j^{\text{Vega}} \rho_{ij}^{\text{Vega}}}$$

SENSITIVITIES BASED METHOD – CURVATURE RISK CAPITAL

Curvature risk capital



Mathematically corresponds to the second-order sensitivity of an instrument's value to a risk factor (the delta of delta, commonly referred to as **gamma** γ for options).



i.e. the change in value induced by an infinitesimal change in the underlying price.

$$K_{\text{Curvature}} = \sqrt{\sum_b \max(K_b^+, K_b^-)}$$

RESIDUAL RISK ADD-ON (RRAO)

Definition : An instrument is deemed to be exposed to residual risk when it is linked to an underlying or embeds additional risk features that are not fully captured by standard risk measures

e.g. Valuation uncertainty, convexity risk, volatility risk, or model risk.

Capital requirement for residual risk



1% of the instrument's notional amount

DEFAULT RISK CHARGE (DRC)

APPLIES TO

- ➔ Debt and equity instruments
- ➔ Derivatives referencing such instruments
- ➔ Derivatives whose payoffs or values are affected by the default

Capital requirement calculated in accordance with the **regulatory Default Risk Charge formula**, which captures the loss associated with a default event.

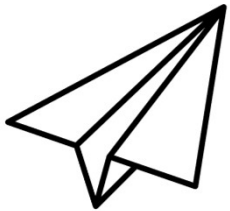
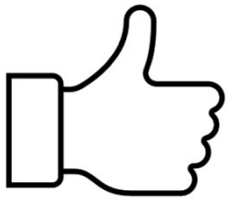
$$K_{\text{DRC}} = \sum_i RW_i \times JTD_i \quad \text{with} \quad JTD_i = \max(LGD_i \times (Notional_i - MV_i), 0)$$

RW_i : Regulatory risk weight determined by issuer's credit rating and type of issuer

LGD_i : Regulatory loss given default

MV_i : Market value of the instrument

Happy to connect and discuss !!!!!



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