Basel Committee on Banking Supervision

Recalibration of shocks in the interest rate risk in the banking book standard

July 2024

BIS

This publication is available on the BIS website (www.bis.org).

ISBN 978-92-9259-775-7 (online)

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Introduction

In December 2023, the Basel Committee on Banking Supervision issued a public consultation on proposed adjustments to its standard on interest rate risk in the banking book (IRRBB).[1]

The Committee proposed to make a set of adjustments to the specified interest rate shocks in the IRRBB standard, consistent with commitments in the standard to periodically update their calibration. It also proposed to make targeted adjustments to the current methodology used to calculate the shocks. These changes are needed to address problems with how the current methodology captures interest rate changes during periods when rates are close to zero.

The main differences between the current methodology and the proposed new methodology set out in the consultative document are:

- Expansion of the time series used in the calibration from December 2015 (used in the current IRRBB standard) to December 2022. The start date of January 2000 remains the same.
- Replacement of the global shock factors with local shock factors calculated directly for each currency using the averages of absolute changes in interest rates calculated over a rolling six-month period.
- A move from a 99th percentile value in determining the shock factor to a 99.9th percentile value, to maintain sufficient conservatism in the proposed recalibration.

The other main elements included in the proposal, such as the shock scenarios, time buckets, caps and floors, and the approach to rounding, remained unchanged from the approach used in the current IRRBB standard.

After considering the feedback on the consultation from stakeholders, the Committee has now finalised the new methodology and updated the interest rate shocks. This document sets out the final revised standard. The Committee wishes to thank respondents for their feedback on the consultative document. The revised standard should be implemented by 1 January 2026. This means that banks whose financial year ends on 31 December would have to provide the relevant disclosure in 2026, based on information as of 31 December 2025.

Considering the feedback received, the Committee agreed to amend the revised standard relative to the proposal set out in the consultation. These changes include:

- **Extending the calibration data to end-2023.** The consultative document proposed to extend the time series for the calibration from December 2015 to December 2022. The final standard expands the time series further to December 2023 to better reflect the latest movements in interest rates.
- **Reducing the rounding of interest rate shocks to a multiple of 25 basis points.** The consultative document retained the rounding of the interest rate shocks to a multiple of 50 basis points, as under the current IRRBB standard. The final standard reduces the rounding of the interest rate shocks to a multiple of 25 basis points. This would reduce cliff effects and potential distortions across jurisdictions, and would provide closer alignment with the incremental steps of changes in central banks' policy rates.

[1] See BCBS, "Recalibration of shocks for interest rate risk," *Consultative Document*, December 2023, www.bis.org/bcbs/publ/d561.pdf.

The final revised sections of the standard are included below. The revised text will also be incorporated into the consolidated Basel Framework (chapters SRP31 and SRP98).

Annex: Revisions to the Basel Framework

Set out below are the final revisions to chapters SRP31 and SRB98 of the Basel Framework.

SRP31

The standardised interest rate shock scenarios

31.90 Banks should apply six prescribed interest rate shock scenarios to capture parallel and non-parallel gap risks for EVE and two prescribed interest rate shock scenarios for NII. The derivation of these shocks is explained in [SRP98.56] to [SRP98.63]. These scenarios are applied to IRRBB exposures in each currency for which the bank has material positions. In order to accommodate heterogeneous economic environments across jurisdictions, the six shock scenarios reflect currency-specific absolute shocks as specified in Table 2 below. For the purposes of capturing the local rate environment, a historical time series ranging from January 2000 to ~~2015~~December 2023 for various maturities[7] was used to derive each scenario for a given currency. Under this approach, IRRBB is measured by means of the following six scenarios:

(1) parallel shock up;

(2) parallel shock down;

(3) steepener shock (short rates down and long rates up);

(4) flattener shock (short rates up and long rates down);

(5) short rates shock up; and

(6) short rates shock down.

Specified size of interest rate shocks, ~~$\bar{R}_{shocktype,c}$~~ $\bar{S}_{shocktype,c}$ — Table 2

	ARS	AUD	BRL	CAD	CHF	CNY	EUR	GBP	HKD	IDR	INR
Parallel	400	~~300~~350	400	200	~~100~~175	~~250~~225	~~200~~225	~~250~~275	~~200~~225	400	~~400~~325
Short	500	~~450~~425	500	~~300~~275	~~150~~250	300	~~250~~350	~~300~~425	~~250~~375	500	~~500~~475
Long	300	~~200~~300	300	~~150~~175	~~100~~200	150	~~100~~200	~~150~~250	~~100~~200	300	~~300~~225

	JPY	KRW	MXN	RUB	SAR	SEK	SGD	TRY	USD	ZAR
Parallel	100	~~300~~225	400	400	~~200~~275	~~200~~275	~~150~~175	400	200	~~400~~325
Short	100	~~400~~350	500	500	~~300~~375	~~300~~425	~~200~~250	500	300	500
Long	100	~~200~~225	~~300~~200	300	~~150~~250	~~150~~200	~~100~~225	300	~~150~~225	300

Footnotes

[7] Jurisdictions may, under national discretion, recalculate the shocks in Table 2 for their domestic currencies using data that deviate from the~~ initial 16-~~24-year period if they better reflect~~s~~ their idiosyncratic circumstances.

31.91 Given Table 2, the instantaneous shocks to the risk-free rate for parallel, short and long, for each currency, the following parameterisations of the six interest rate shock scenarios should be applied:

(1) Parallel shock for currency *c*: a constant parallel shock up or down across all time buckets.

~~$$\Delta R_{parallel,c}\left(t_k\right) = \pm \bar{R}_{parallel,c}$$~~

$$\Delta S_{parallel,c}\left(t_k\right) = \pm \bar{S}_{parallel,c}$$

(2) Short rate shock for currency *c*: shock up or down that is greatest at the shortest tenor midpoint. That shock, through the shaping scalar ~~$S_{short}\left(t_k\right) = \left(e^{\frac{-t_k}{x}}\right)$~~ $\alpha_{short}\left(t_k\right) = e^{\frac{-t_k}{x}}$, where x = 4, diminishes towards zero at the tenor of the longest point in the term structure.[8]

~~$$\Delta R_{short,c}\left(t_k\right) = \pm \bar{R}_{short,c} \cdot S_{short}\left(t_k\right) = \pm \bar{R}_{short,c} \cdot e^{\frac{-t_k}{x}}$$~~

$$\Delta S_{short,c}\left(t_k\right) = \pm \bar{S}_{short,c} \cdot \alpha_{short}\left(t_k\right) = \pm \bar{S}_{short,c} \cdot e^{\frac{-t_k}{x}}$$

(3) Long rate shock for currency *c* (note: this is used only in the rotational shocks): Here the shock is greatest at the longest tenor midpoint and is related to the short scaling factor as: ~~$S_{long}\left(t_k\right) = 1 - S_{short}\left(t_k\right)$~~ $\alpha_{long}\left(t_k\right) = 1 - \alpha_{short}\left(t_k\right)$.

~~$$\Delta R_{long,c}\left(t_k\right) = \pm \bar{R}_{long,c} \cdot S_{long}\left(t_k\right) = \pm \bar{R}_{long,c} \cdot \left(1 - e^{\frac{-t_k}{x}}\right)$$~~

$$\Delta S_{long,c}\left(t_k\right) = \pm \bar{S}_{long,c} \cdot \alpha_{long}\left(t_k\right) = \pm \bar{S}_{long,c} \cdot \left(1 - e^{\frac{-t_k}{x}}\right)$$

(4) Rotation shocks for currency *c*: involving rotations to the term structure (ie steepeners and flatteners) of the interest rates whereby both the long and short rates are shocked and the shift in interest rates at each tenor midpoint is obtained by applying the following formulas to those shocks:

~~$$\Delta R_{steepener,c}\left(t_k\right) = -0.65 \cdot \left|\Delta R_{short,c}\left(t_k\right)\right| + 0.9 \cdot \left|\Delta R_{long,c}\left(t_k\right)\right|$$~~

~~$$\Delta R_{flattener,c}\left(t_k\right) = +0.8 \cdot \left|\Delta R_{short,c}\left(t_k\right)\right| - 0.6 \cdot \left|\Delta R_{long,c}\left(t_k\right)\right|$$~~

$$\Delta S_{steepener,c}\left(t_k\right) = -0.65 \cdot \left|\Delta S_{short,c}\left(t_k\right)\right| + 0.9 \cdot \left|\Delta S_{long,c}\left(t_k\right)\right|$$

$$\Delta S_{flattener,c}\left(t_k\right) = +0.8 \cdot \left|\Delta S_{short,c}\left(t_k\right)\right| - 0.6 \cdot \left|\Delta S_{long,c}\left(t_k\right)\right|$$

<u>*Footnotes*</u>

[8] The value of x *in the denominator of the function* $e^{\frac{-t_k}{x}}$ *controls the rate of decay of the shock. This should be set to the value of 4 for most currencies and the related shocks unless otherwise determined by national supervisors.* t_k *is the midpoint (in time) of the* k^{th} *bucket and* t_K *is the midpoint (in time) of the last bucket* K. *There are 19 buckets in the standardised framework, but the analysis may be generalised to any number of buckets.*

31.92 The following examples illustrate the scenarios in [SRP31.91](2) and [SRP31.91](4).

(1) Short rate shock: Assume that the bank uses the standardised framework with K = 19 time bands and with t_K = 25 years (the midpoint (in time) of the longest tenor bucket K), and where t_K is the midpoint (in time) for bucket k. In the standardised framework, if k = 10 with t_k = 3.5 years, the scalar adjustment for the short shock would be ~~$S_{short}(t_k) = e^{\frac{-3.5}{4}}$~~ $\alpha_{short}(t_k) = e^{\frac{-3.5}{4}}$ = 0.417. Banks would multiply this by the value of the short rate shock to obtain the amount to be added to or subtracted from the yield curve at that tenor point. If the short rate shock was +100 basis points (bp), the increase in the yield curve at t_k = 3.5 years would be 41.7 bp.

(2) Steepener: Assume the same point on the yield curve as above, t_k = 3.5 years. If the absolute value of the short rate shock was 100 bp and the absolute value of the long rate shock was 100 bp (as for the Japanese yen), the change in the yield curve at t_k = 3.5 years would be the sum of the effect of the short rate shock plus the effect of the long rate shock in bp: −0.65 x 100 bp x 0.417 + 0.9 x 100bp x (1−0.417) = +25.4 bp.

(3) Flattener: The corresponding change in the yield curve for the shocks in the example above at t_k = 3.5 years would be: +0.8 x 100 bp x 0.417 – 0.6 x 100 bp x (1−0.417) = −1.6 bp.

31.93 The Committee acknowledges that shock sizes of different currencies should reflect local conditions in a timely manner. For this reason, the Committee will review the calibration of the interest rate shock sizes (eg every five years). National supervisors may, at their discretion, set floors for the post-shock interest rates under the six interest rate shock scenarios, provided the floors are not greater than zero.

SRP98

Derivation of the interest rate shocks

98.56 [SRP31] describes six prescribed interest rate shock scenarios that banks should apply to parallel and non-parallel gap risks for EVE and two prescribed interest rate shock scenarios for NII. In order to derive these shocks, the following general steps are taken.

~~98.57 Step 1: generate a 16-year time series of daily average interest rates for each currency c. The average daily interest rates from the year 2000 (3 January 2000) to 2015 (31 December 2015) are contained in Table 1. The average local percentile of the rate series is determined by calculating the average rate across all daily rates in time buckets 3m, 6m, 1Y, 2Y, 5Y, 7Y, 10Y, 15Y and 20Y.~~

~~Average interest rates by currency~~ ~~Table 1~~

	~~ARS~~	~~AUD~~	~~BRL~~	~~CAD~~	~~CHF~~	~~CNY~~	~~EUR~~	~~GBP~~	~~HKD~~	~~IDR~~	~~INR~~
~~Average~~	~~3363~~	~~517~~	~~1153~~	~~341~~	~~183~~	~~373~~	~~300~~	~~375~~	~~295~~	~~1466~~	~~719~~

	~~JPY~~	~~KRW~~	~~MXN~~	~~RUB~~	~~SAR~~	~~SEK~~	~~SGD~~	~~TRY~~	~~USD~~	~~ZAR~~
~~Average~~	~~89~~	~~471~~	~~754~~	~~868~~	~~360~~	~~330~~	~~230~~	~~1494~~	~~329~~	~~867~~

~~98.58 Step 2: the global shock parameter is prescribed based on the weighted average of the currency-specific shock parameters, $\bar{\alpha}_i$. The shock parameter for scenario i is a weighted average of the $\alpha_{i,c,h}$ across all currencies and defined as $\bar{\alpha}_i$. The following baseline global parameters are obtained:~~

Baseline global interest rate shock parameters		Table 2
Parallel	$\bar{\alpha}_{parallel}$	60%
Short rate	$\bar{\alpha}_{short}$	85%
Long rate	$\bar{\alpha}_{long}$	40%

98.59 Applying the α_i from Table 2 to the average long-term rates from Table 1 results in the revised interest rate shocks by currency for parallel, short and long segments of the yield curve in Table 3.

Revised interest rate shocks, $\Delta\bar{R}_{shocktype,c}$ — Table 3

	ARS	AUD	BRL	CAD	CHF	CNY	EUR	GBP	HKD	IDR	INR
Parallel	2018	310	692	204	110	224	180	225	177	880	431
Short	2858	440	980	290	155	317	255	319	251	1246	611
Long	1345	207	461	136	73	149	120	150	118	586	288

	JPY	KRW	MXN	RUB	SAR	SEK	SGD	TRY	USD	ZAR
Parallel	53	283	452	521	216	198	138	896	197	520
Short	75	401	641	738	306	280	196	1270	279	737
Long	35	188	301	347	144	132	92	597	131	347

98.60 However, the proposed interest rate shock calibration can lead to unrealistically low interest rate shocks for some currencies and to unrealistically high interest rate shocks for others. In order to ensure a minimum level of prudence and a level playing field, a floor of 100 basis points and variable caps (denoted as $\Delta\bar{R}_j$) are set for the scenarios concerned, those caps being 500 basis points for the short-term, 400 basis points for the parallel and 300 basis points for the long-term interest rate shock scenario.

98.61 The change in the risk-free interest rate for shock scenario j and currency c can be defined as follows, where $\Delta\bar{R}_j$ is 400, 500 or 300 when j is parallel, short or long respectively.[11]

$$\bar{R}_{j,c} = \max\left(100, \min(\Delta\bar{R}_{j,c}, \Delta\bar{R}_j)\right)$$

Footnotes

[11] In the case of the rotation scenarios, $\Delta\bar{R}_{j,c}$ cannot exceed 500 basis points and $\Delta\bar{R}_{j,c}\left(t_k\right)$ cannot exceed 300 basis points.

98.62 Applying the caps and floors to the shocks described in Table 3 results in the final set of interest rate shocks by currency that is shown in [SRP31.90].

98.57 Step 1: Generate a time series of daily interest rates $R_{k,c}$ from the year 2000 (3 January 2000) to 2023 (29 December 2023) in the time buckets k = 3m, 6m, 1Y, 2Y, 5Y, 7Y, 10Y, 15Y and 20Y for each currency c.

98.58 Step 2: Using the time series of the interest rate levels at each tenor point k and for each currency c, calculate a new time series of rate changes $\Delta R_{k,c}$ for a moving time window of h = 6 months (125 days).

$$\Delta R_{k,c}\left(t\right) = R_{k,c}\left(t\right) - R_{k,c}\left(t-h\right)$$

98.59 Step 3: For each scenario i and currency c, take the average of the rate changes across the corresponding time buckets in Table 1, where N_i represents the number of time buckets.

$$\Delta R_{i,c}\left(t\right) = \frac{1}{N_i}\sum_{k}\Delta R_{k,c}\left(t\right)$$

Average interest rate change by time bucket Table 1

Scenario	Averaged interest rate series	Time buckets
Parallel	$\Delta R_{parallel,c}\left(t\right)$	3m, 6m, 1Y, 2Y, 5Y, 7Y, 10Y, 15Y, 20Y
Short rate	$\Delta R_{short,c}\left(t\right)$	3m, 6m, 1Y
Long rate	$\Delta R_{long,c}\left(t\right)$	10Y, 15Y, 20Y

98.60 Step 4: Use the 99.9th percentile value of the absolute value of $\Delta R_{i,c}$ over the period from 2000 to 2023, denoted $\left|\Delta R_{i,c}\left(t\right)\right|$, for the interest rate shock of scenario i for currency c.

$$S_{i,c} = P_{99.9}\left(\left|\Delta R_{i,c}\left(t\right)\right|\right)$$

98.61 Step 5: In order to ensure a minimum level of prudence and a level playing field, set a floor of 100 bp and variable caps (denoted as $\bar{C}_i$) for the scenarios concerned, those caps being 500 bp for the short-term, 400 bp for the parallel and 300 bp for the long-term interest rate shock scenario. The change in the interest rate shock for scenario i and currency c can be defined as:

$$\bar{S}_{i,c} = \max\left\{100, \min\left\{S_{i,c}, \bar{C}_i\right\}\right\}$$

where $\bar{C}_i$ = {400, 500, 300}, for i = parallel, short, and long, respectively.

98.62 Step 6: Finally, round the values from step 5 to the nearest multiple of 25 bp. This methodology results in the specified interest rate shocks set out in [SRP31.90].

98.63 Supervisors may, applying national discretion, set a higher floor under the local interest rate shock scenarios for their home currency, or a higher cap, resulting in more conservative shocks. Supervisors may also, applying national discretion, set a zero or negative lower bound for the post-shock interest rates $\bar{R}_{j,c}$, where j represents the six interest rate shock scenarios set out in [SRP31.91].

~~$\bar{R}_{j,c}(t_k) = \max\left(\bar{R}_{0,c}(t_k) + \Delta\bar{R}_{j,c}(t_k), (\textit{zero or negative lower bound set})\right)$~~

$$\bar{R}_{j,c}(t_k) = \max\left(\bar{R}_{0,c}(t_k) + \Delta\bar{S}_{j,c}(t_k), (\textit{zero or negative lower bound set})\right)$$