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Managing interest rate risk in the banking book (IRRBB)

An overview of the guidelines from the European Banking Authority

ALMIS INTERNATIONAL

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Introduction

From 30th June 2023 the European Banking Authority (EBA) are bringing into force their revised guidelines on managing Interest Rate Risk in the Banking Book (IRRBB), following the previous update in 2018. This paper discusses the key themes arising from the publication as well as considering this relative to the UK's framework. The guidelines do also consider Credit Spread Risk in the Banking Book (CSRBB), however this topic is out of scope for this article and the EBA has deferred its implementation until 31st December 2023.

Ultimately, following the UK's 'Brexit' and the publication of the Prudential Regulation Authority (PRA) Rulebook, these guidelines will not necessarily have a direct bearing on UK institutions, however, given the rising interest rates generally over the last 12+ months, the volatility seen in swap markets and more recent high-profile bank failures, this is very much a relevant and topical area of discussion. For firms with dual-reporting obligations, naturally this will have bearing, but given in both the EU and the UK the standardised model is designed as a 'backstop' frameworks, there may be elements firms may wish to consider as part of their own internal modelling. Finally, the update to the EBA guidelines also poses the question around whether the UK will consider any refinement to the rulebook that came into effect from 31st December 2021.

The guidelines are published along with two regulatory technical standards:

(i) an update to the existing supervisory outlier test (SOT) and;
(ii) the introduction of a standardised (and simplified standardised) methodology for managing IRRBB.

Neither are mutually exclusive and both aspects are expected to be incorporated into a firm's IRRBB governance framework.

Supervisory Outlier Tests

Economic Value of Equity (EVE)

Many will assumably be familiar with the current EVE outlier test methodology, having come into effect in (June) 2019.

In summary, however, this requires firms to allocate interest rate sensitive positions (on and off balance sheet) into 19 defined timebuckets and individually assess the impact of six prescribed interest rate shock scenarios against the baseline scenario to identify the largest negative impact to a firm's EVE.

The prescribed six shock scenarios are as follows, and based upon the same scenarios defined in the Basel standard:
(i) Parallel up
(ii) Parallel down
(iii) Steepener shock
(iv) Flattener shock
(v) Short rates shock up
(vi) Short rates shock down

For firms with positions in multiple currencies, the position requires assessment by currency with parameters calibrated by currency and rules on how gains and losses can be aggregated under a single scenario.

Where Tier 1 capital declines by more than 15% under any scenario, this must be reported to the firm's regulator and may result in additional own funds requirements, operational restrictions of certain activities, additional monitoring and reporting obligations and so forth.

On the basis of assumed familiarity with this methodology, I will not go through the calculations in detail here and note the key updates to this framework. Please contact info@almis.co.uk should you be interested in past content provided on this topic.

Net Interest Income (NII) Outlier Test

One of the key changes is the introduction of a NII outlier test. Whereas previously, the prescribed methodology focussed on the EVE impact, there is now a prescribed NII Test looking to identify firms who would see a "large decline" in their NII under the test.

There are two prescribed scenarios, a parallel shock up and a parallel shock down, and firms are required to calculate the NII impact across a one-year horizon. In order to calculate their NII impact, firms are advised to calculate this on a constant balance sheet basis (in contrast to the run-off balance sheet required for the EVE assessment). This means that the total balance sheet size is

maintained over the horizon, with repricing or maturing items replaced with items of comparable amounts, repricing, currency and maturity characteristics.

The RTS also explicitly states that the calculation should include commercial margin and any spread components for the purposes of the calculation.

For the purposes of the test, the RTS also defines what firms' should consider as 'NII' – interest income less interest expense – acknowledging that there are subtle variations in what firms consider NII as across the industry.

Firms that see a 'large decline' in their net interest income (defined as greater than 2.5% relative to Tier 1 Capital) are considered outliers.

$$\frac{NII_{shock} - NII_{baseline}}{Tier\ 1\ Capital} < -2.5\%$$

Practitioners have cited the NII outlier test as a timely and sensible addition to the EBA's framework, providing a resilient mechanism to measure true interest rate risk that can be missed with the EVE tests.
However, there has been criticism that the sole approach uses the constant balance sheet assumption rather than the firm's own management plan.

In effect, measuring NII using this methodology effectively repeats the EVE tests but for a shorter time period and misses out on the risks that NII often captures in addition to a simple open mismatch. Nevertheless, the constant balance sheet assumption does provide a transparent and accurate depiction of a firm's current position.

The key change to the EVE methodology is a revision to the maturity dependent post-shock interest rate floor. The 2018 guidelines included a maturity dependent post-shock interest rate floor of -100bps, increasing by 5bps per year over 20 years and applicable to the shock scenarios. The EBA has recalibrated this to a -150bps floor and increasing this by 3bps per year over 50 years. The rationale for this change were some specific examples in the market that would have resulted in the baseline scenario being below the floor but caught by the floor for the shock scenarios.

Standardised / simplified Standardised Methodologies for IRRBB

The EBA has also finalised their standardised methodologies for firms to 'identify, evaluate, manage and mitigate' their IRRBB. It is important to note that these methodologies are not mandatory as the guidelines state:
"... either if they implement internal systems or use the standardised methodology or the simplified standardised methodology for the evaluation of IRRBB." In practice, the regulator expects firms to devise relevant models that capture their specific risks and in the absence of this they would request the calculation of the standardised method.

There are two methodologies prescribed, a standardised (SA) and a simplified standardised (S-SA) methodology. The S-SA methodology is intended for small and non-complex institutions, which the EU define as:

- Not a large institution;
- On average, <= €5bn assets;
- No, or limited trading book;
- Small derivative positions

As the name infers, the S-SA methodology seeks to simplify the requirement and remove some of the administrative burden of the SA methodology, whilst (at the very least) maintaining the level of conservativism of the model.

This article will predominantly focus on the features of the SA methodology before summarising the key simplifications the S-SA methodology provides.

Similar to the SOT, the SA (and the S-SA) methodology covers both an EVE and an NII requirement.

Economic Value of Equity

The methodology requires all material positions to be included, defining material as being 5% of the total non-trading assets or liabilities. Positions less than 5% may require to be included to ensure that at least 90% of the total non-trading positions are included for evaluation.

7 types of positions are defined as a minimum, each with specific guidance on how balances should be allocated.

1. Fixed rate instruments
2. Floating rate instruments
3. Non-maturity deposits
4. Fixed rate loans subject to early repayment risk
5. Term deposits subject to early redemption
6. For derivatives not subject to optionality
7. Other instruments

Similar to the SOT, firms must allocate each of the positions to the 19 time buckets as defined in the Basel standard. Similarly again, within each bucket, cash flows should be assumed to occur at the mid-point of the bucket. For the avoidance of any doubt, the EBA has explicitly defined these mid-points in days.

For, commercial margins, the RTS notes that these can either be included or excluded and based upon the firm's own internal risk management approach. Where a firm elects to exclude the commercial margin, they are required to do so on a transparent and consistent basis and must notify their supervisory body.

1.Fixed Rate Instruments

Firms are required to assign interest and principal repayment cash flows into the relevant time bucket(s).

2. Floating Rate Instruments

Firms are required to split out cash flows pertaining to floating rate instruments into three parts and allocate these to the relevant time buckets:

Interest cashflows, excluding any commercial margin or other spread components to the first repricing date.
Principal cashflows
Commercial margin and other spread cash flows to maturity, unless explicitly being excluded.

3. Non-Maturity Deposits

Non-maturity deposits are accepted as not being amenable to standardisation, given their behaviouralised nature and that can vary widely by institution, product and customer. In order to treat non-maturing deposits in a standardised model, a firm is required to segment their non-maturing book based upon four tiers of classification based upon the characteristics of the customer/counterparty and the product.

Tier 1

Non-maturing deposits are initially required to be segmented into Retail and Wholesale deposits. The RTS does not explicitly state, but it can be assumed that Retail deposits would include qualifying SME deposits as well on the basis this is defined in the Basel standard.

Tier 2

Retail deposits are then segmented into transactional (e.g. current and payment accounts) and non-transactional deposits (e.g. instant access deposit accounts) and Wholesale into Financial and non-financial customers.

Tier 3

For each of these sub-groupings except for Wholesale deposits from financial customers, these deposits are required to be further-segmented into a stable and non stable-groupings. A stable deposit is one that is considered highly likely to remain with the institution at the current level of interest rates.

The RTS notes that the assessment of whether a deposit is stable or not should be based upon 'observed changes due to upwards and downwards movements of the risk-free interest rate for a period of at least the preceding ten years.' Given the relatively benign interest rate environment across the last decade, this may be difficult to do in practice with any confidence, given rates have only really been rising for the last couple of years and during which there have been other factors potentially influencing customer behaviour e.g. the COVID-19 pandemic.

Tier 4

Stable deposits are required to be split into a core and a non-core component, with the core portion representing the portion of deposits unlikely to reprice even under a significantly changing interest rate environment. To do this, firms are required to identify a 'pass-through rate' based upon factors such as the current product relative to the market, their customer base characteristics and how unlikely the core component would be to reprice, even under a significantly changing interest rate environment. The stable deposits are multiplied by the pass-through rate to calculate the non-core component.

In shock scenarios prescribing a short-term interest rate increase the core component shall be multiplied by 0.8 and the difference applied as an increase to non-core deposits. In shock scenarios prescribing short term interest rate decrease the core component shall be multiplied by 1.2 and the difference deducted from to non-core deposits.

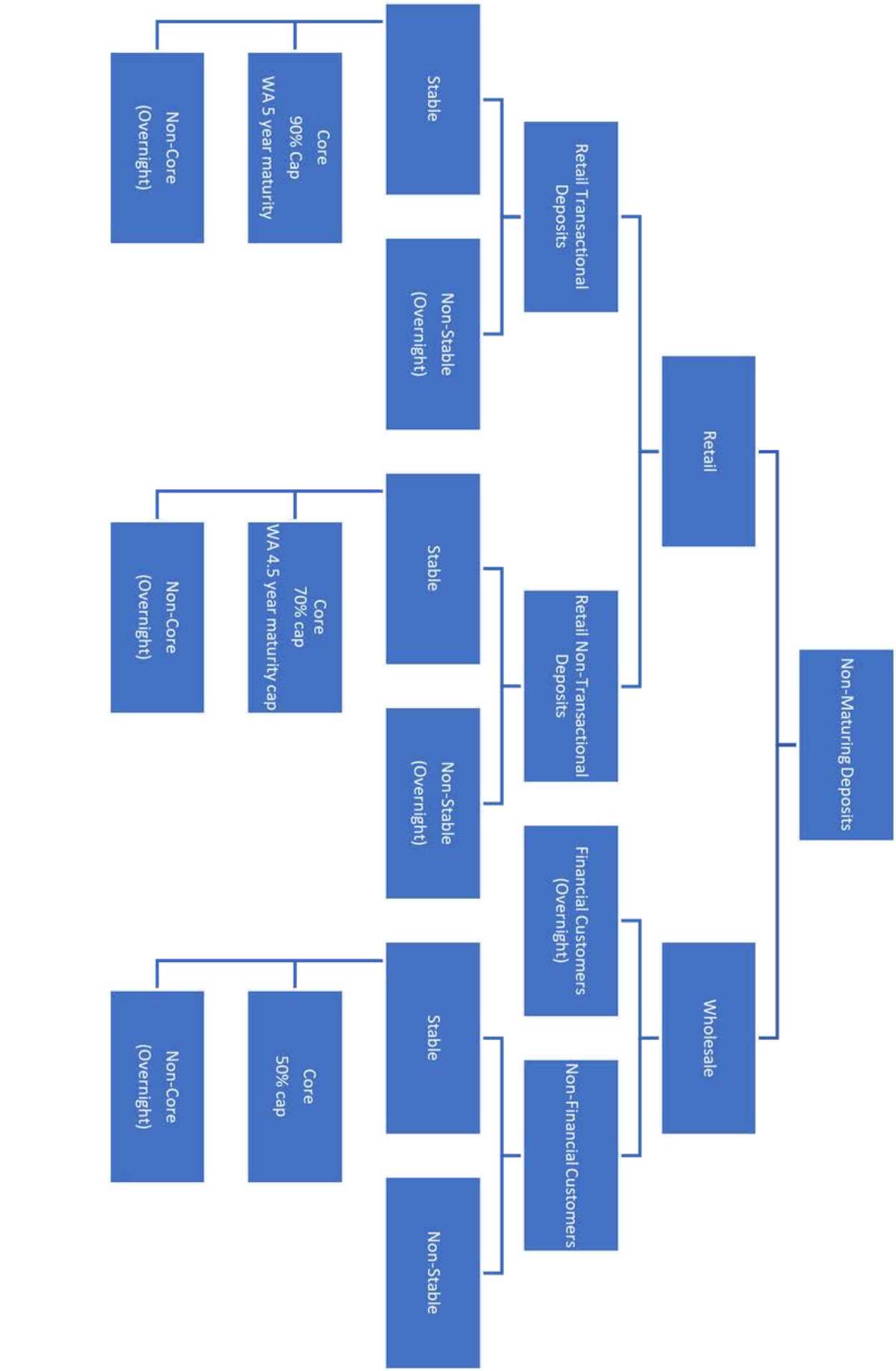
There is a cap prescribed on the amount of deposits a firm can deem as core in the baseline scenario:

- 90% for retail transactional non-maturity deposits
- 70% for retail non-transactional non-maturity deposits
- 50% for wholesale non-financial customer non-maturing deposits.

Core deposits should then be allocated across each of the 19 time-buckets, based upon the expected maturity. The RTS notes this should be applied consistently over time and based upon observable internal data, however there is also a restriction on the resultant weighted average maturity for each core category:

- 5 years for retail transactional non-maturity deposits
- 4.5 years for retail non-transactional non-maturity deposits
- 4 years for wholesale non-financial customer non-maturing deposits.

All non-core components, including Wholesale Financial and non-stable deposits should be allocated to the overnight bucket of the gap report.


Non-Maturing Deposits
Retail
Retail Transactional Deposits
Stable
Core
90% Cap
WA 5 year maturity
Non-Core
(Overnight)
Non-Stable
(Overnight)
Retail Non-Transactional Deposits
Stable
Core
70% cap
WA 4.5 year maturity cap
Non-Core
(Overnight)
Non-Stable
(Overnight)
Wholesale
Financial Customers
(Overnight)
Stable
Core
50% cap
Non-Core
(Overnight)
Non-Financial Customers
Non-Stable

4. Fixed Rate Loans Subject to the Risk of Early Repayment

This category is applicable for Retail loans where the customer has the ability to prepay all or part of a loan without bearing the economic cost for doing so.This would also include the scenario where an economic cost would apply but only above a certain threshold. Loans to Wholesale customers that can prepay part or all of a loan early should not be included in this category, but treated as a Fixed Rate Instrument.

A firm will have to calculate a baseline average prepayment rate for each portfolio of homogenous positions based upon internal data and using observations. Immaterial portfolios of loans, less than 5% of the overall position being evaluated, can ignore the impact of prepayments and set this rate to 0%.

Under a shock scenario where interest rates are rising, the baseline conditional prepayment rate should be multiplied by 0.8 and conversely under shock scenarios where the interest rates are falling, the baseline conditional prepayment rate should be multiplied by 1.2 assuming the level of prepayments fall.

For each time-bucket, the prepayment amount should be calculated on the opening balance of the bucket i.e. taking into account past amortisation and pre-payment.

The RTS also stipulates that any associated projected fee income from early repayments should be included in the time-bucket it is expected to be received.

5. Term Deposits Subject to the Risk of Early Withdrawal

Included in this position are Retail deposits where the customer is able to withdraw their funds early, ahead of the original contractual maturity. If the early withdrawal would result in a penalty to the customer covering both forgoing interest between the withdrawal date and the contractual maturity and the economic cost of of redeeming the deposit, this type of deposit should be treated under Fixed Rate Instruments and not Term Deposits Subject to the Risk of Early Withdrawal. For each portfolio of homogenous positions, a firm is required to calculate a cumulative term deposit redemption rate and calculate the expected amount of early withdrawals per time bucket.

The aggregated early withdrawals expected across all time-buckets should be mapped into the overnight bucket. Remaining cash flows should be allocated to the time bucket relative to their original contractual maturity.

6. Derivatives not subject to optionality

Derivatives should be split into two legs, a paying and a receiving leg.

7. Other Instruments

Firms should report in this section non-performing exposures where the firm's non-performing exposure ratio (non-performing exposures / gross debt securities and loans and advances) is 2% or greater. The expected cash flows and timing of these exposures should be allocated (net of provisions) across the anticipated time buckets.

Where a firm's fixed rate loan commitments to retail customers is greater than 2% of the positions included in the evaluation, the firm will estimate and allocate how these commitments are expected to draw across the 19 time buckets.

EVE Add on for automatic interest rate options

For items with embedded automatic interest rate options, the impact on notional repricing cash flows from these options should be excluded from the allocation of cash flows into the 19 time-buckets i.e. the cash flows should be allocated as if the options do not exist. Instead an EVE add on is required to be calculated and applied to the overall result of the scenario.

There is no prescribed method for determining the change in value with the RTS advising firms should apply their own relative internal valuation methods, however noting that firms should assume a relative increase in the implicit rate volatility of 25%.

Aggregation

For each interest rate scenario and per currency:

- All notional repricing cash flows allocated to the relevant time-buckets as outlined above, ultimately calculating a net positive or negative value for each repricing time bucket.
- Under each scenario, these values should be discounted towards a present value using a discount factor calculated from the risk-free curve.
- The net discounted repricing cash flows should be aggregated for the baseline and shock scenario(s).
- The change in EVE under the scenario is calculated as the EVE from the shock scenario less the EVE from the baseline scenario and adding on the embedded automatic interest rate option add-on.
- For firms with positions in multiple currencies, the results should be aggregated by converting other currencies to the reporting cash flow and;
- Where a positive change (gain) is offsetting a negative change (loss) the positive changes shall be weighted by 50% (or 80% between ERM II currencies).

Net Interest Income

Neither Basel nor the PRA have prescribed a SA methodology for the calculation of NII and the EBA has developed a methodology that differs in part from that of EVE.

Unlike EVE, the NII impact should be based upon a constant balance sheet methodology and, critically, repricing or maturating items being replaced should be priced based upon the characteristics of the original item e.g. a 5 year fixed loan repricing would be repriced at an assumed 5 year rate and repricing differently to a 3 year loan repricing at the same time.

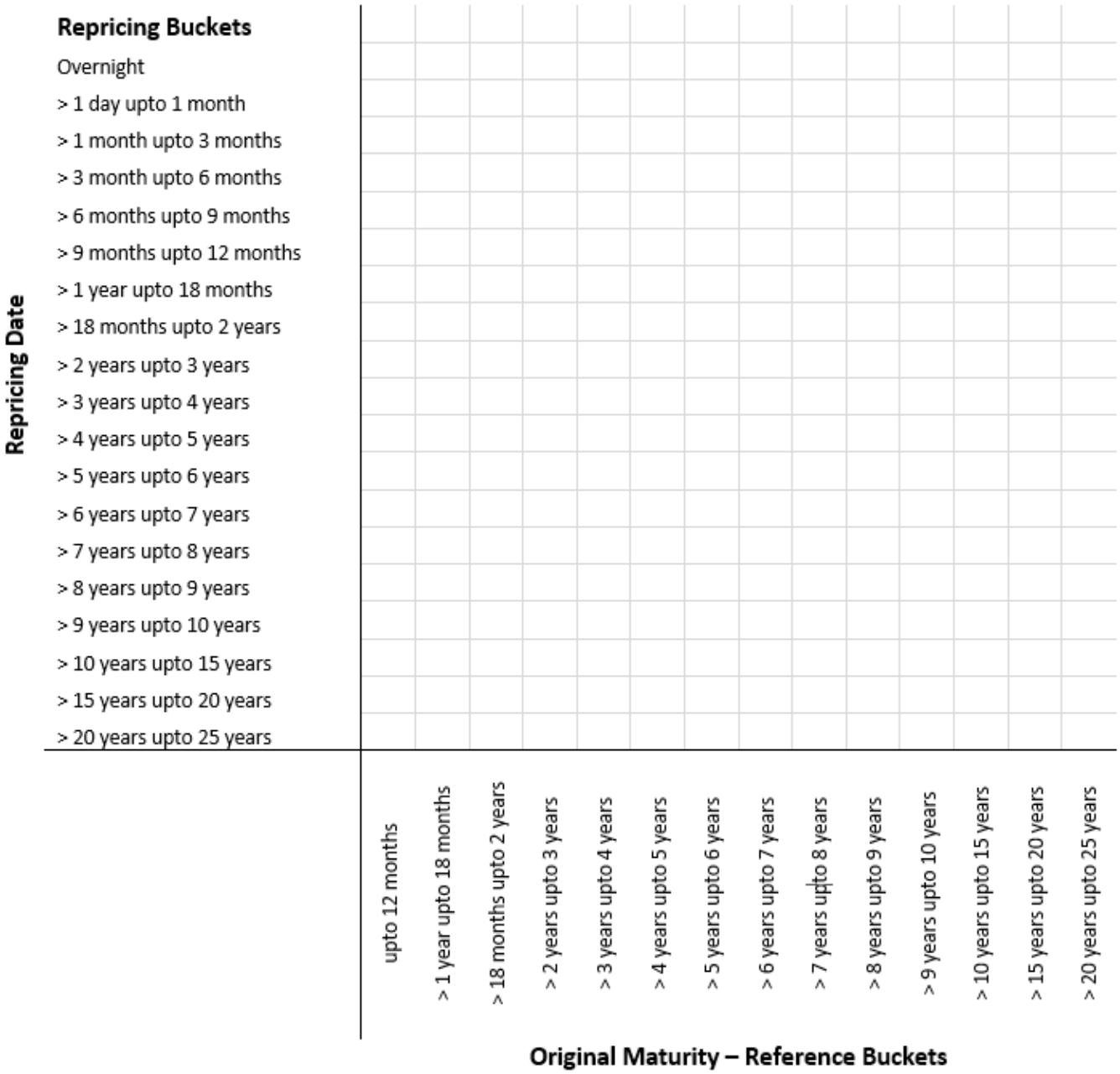
The RTS confirms that the minimum time horizon should be 1 year, but firms can determine the appropriate time horizon(s) for their institution as long as the minimum horizon is satisfied.

In order to work out the NII impact firms are required to consider or calculate the following cash flows:

- Interest payments already fixed
- Projection of risk free yield based on original maturity characteristics
- Commercial margin on repricing cash flows

Interest payments already fixed

Only interest payments where the amount is known, fixed and the payment falls within the NII horizon should be included.



The values included on the Y-axis will be filtered in practice to only include the repricing buckets relative to the net interest income scenario horizon e.g. the top six rows only under a one-year horizon.

Commercial Margins

Firms are required to estimate the commercial margins and apply this margin from the reset point of the commercial margin to the end of the NII horizon. In order to do this firms are required to allocate their positions into each of the product types per currency and by geographical location:

Assets
Debt securities
Loans and Advances – Non-Financial Corporates
Loans and Advances – Household Mortgages
Loans and Advances – Household Credit (non-mortgage)
Loans and Advances – other counterparties
Other products in the Non-Trading book

Liabilities
Deposits – Non-Financial Corporates
Deposits – Households
Deposits – Other Counterparties
Debt Securities
Other liabilities in the non-trading book

For instruments traded in 'deep and active liquid markets' and with widely available data to do so, the commercial margin shall be determined by deducting the risk-free rate from the market price. Alternatively, this should be calculated as the weighted average received or paid in the last 360 days.

The commercial margins shall be assumed to be constant in both the baseline and shock scenario(s).

Basis Risk add-on

Where a firm has floating rate exposures (excluding overnight exposures) greater than 5% of the overall positions being evaluated they are required to calculate a basis risk add-on.

The notional repricing cash flows of these exposures are required to be allocated to the relevant reference term:

Overnight;
1 month;
3 months;
6 months;
12 months;

Where a reference term isn't applicable, these exposures should be allocated to one of the following bases:

- Policy rate – where linked to a central bank rate.
- Other rate – where linked to any other benchmark.

Firms are required to create an estimate of tightening and widening shock scenarios for each reference category above, based on the historic interest rate movements within each reference term relative to the overnight rate

As part of the calculation, payouts relating to automatic interest rate options for each scenario (with no assumptions applied regarding changes in volatility) should be compared to the baseline scenario and included in the overall NII impact for the tightening and widening scenarios.

The add on will be based upon the largest negative impact on net interest income.

NII Add on for automatic interest rate options
This will be calculated in the same way as under the EVE methodology other than the add on will be based on automatic interest rate options falling within the NII horizon only.

Aggregation

- For currency for a baseline and each shock scenario, sum the projected risk-free yields, the projected yield from commercial margins and the sum of interest payments up to their reset date, deducting any material accrued interest at the balance sheet date.
- Calculate the difference between each shock and the baseline scenarios.
- Add the add-on relating to automatic interest rate options calculated under the NII horizon.
- Add the add-on relating to basis risk.

- Where there are multiple currencies under each interest rate shock scenario, aggregate by currency following the same rules as under EVE, where only a proportion of gains can offset losses.

Simplifications offered via the S-SA method

For EVE, There are two key simplifications offered by the S-SA methodology, relating to allocation of non-maturing deposits and the calculation of the optionality risk add on.

For the allocation of non-maturing deposits, rather than firms identifying a pass-through rate to calculate the core component, prescribed thusly for the (i) baseline; (ii) short term interest rate decrease and (iii) short term interest rate increase scenarios:

- Retail transactional deposits: (i) 69.23%; (ii) 90%; (iii) 48.46%, respectively
- Retail non-transactional deposits: 53.85%; (ii) 70% (iii) 37.69%, respectively
- Wholesale non-financial customer deposits: (i) 38.46%; (ii) 50%; (iii) 26.92%, respectively

For the automatic volatility add-on, firms are still required to calculate this, however without taking account of the relative 25% increase in volatility. Instead, they should multiply the payout calculated by 1.10.

For NII, there is no requirement to allocate cashflows into the original maturity reference term for the purposes of identifying the appropriate forward rate. Instead, an average reference term for all fixed rate items within each product type category below should be calculated instead and this term (rather than the mid-point of the relevant reference term bucket) should be used to identify the appropriate forward rate.

Assets
Debt securities
Loans and Advances – Non-Financial Corporates
Loans and Advances – Household Mortgages
Loans and Advances – Household Credit (non-mortgage)
Loans and Advances – other counterparties
Other products in the Non-Trading book

Liabilities
Deposits – Non-Financial Corporates
Deposits – Households
Deposits – Other Counterparties
Debt Securities

Other liabilities in the non-trading book

For the calculation of interest payments already fixed in the SA methodology, rather than including fixed and known interest payments only, firms shall multiply the outstanding principal of all instruments outstanding by an estimated average interest rate per instrument and by the duration of the horizon unless the item reprices before the horizon date, in which case by the mid-point of the repricing bucket.

Finally, for the calculation for the add on relating to automatic interest rate options, similar to the S-SA approach to EVE, this can be calculated without taking account of the relative 25% increase in volatility and multiple the calculated pay-outs by 1.10.

Comparison of the UK and EU standardised methodologies

Both the PRA Standardised methodology and the EBA (EVE) Standardised methodologies are based upon the Basel framework and therefore in many places are aligned. However, there are a number of differences worthy of consideration.

In the UK, the standardised methodology is explicitly positioned as an alternative to a firm's own internal methods of identifying, evaluating and managing IRRBB and, formally, a firm must notify the PRA of their intention to implement (or cease) the standardised methodology. Similarly the EBA do note that firms "… either if they implement internal systems or use the standardised methodology or the simplified standardised methodology" and that the SA methodology "is not intended to replace internal methods with standardised methodologies."

However, they are certainly more bullish and also state that they may require an institution to use the standardised methodology if their internal systems are deemed unsuitable.

There is no standardised NII scenario defined in the PRA Rulebook, nor in the Basel Standards and this is something the EBA have developed this similar.

The EBA have developed a simplified approach, detailed above for 'small and non-complex firms', largely applying to firms with balance sheet size of less than €5bn, however in the UK there is no simplified option. Interestingly, the PRA's threshold for strong and simple has been increased to £20bn and it will be interesting to observe whether the PRA considers a simplified option.

In the SOT impact assessment, the EBA note they considered two different definitions of NII; a 'narrow' definition – interest income less interest expenses – and a 'wider' definition including market value changes of instruments held at Fair Value (FV). For the SOT, the narrow definition has been adopted whereas the SA and S-SA require the change in market value for items held at Fair Value to be calculated, however this value is not included in the overall NII calculation and intended for monitoring / evaluation purposes.

The PRA do not define a time-horizon for NII to be evaluated over, whereas the EBA state a minimum of one year under the SA / S-SA methodology and one-year for the SOT.

The PRA standardised methodology define the interest rate shock scenarios as the six-shock scenarios as defined in the Basel Standard. The EBA makes reference to interest rate shock scenarios, but doesn't formally define what these are, instead instructing firms to classify shock scenarios into one of three types:

- Parallel shocks
- Shocks involving rotations to the term structure
- Uneven shocks

The PRA methodology suggests that firms should discount cash flows using a risk-free zero-coupon curve inclusive of commercial margins and other spread components unless they implement a prudent and transparent methodology for deducting commercial margin and other spread components from initial repricing cash flows.

Alternatively, the EBA defer the selection of a suitable risk-free curve to the institution as long as there is only one risk free curve used per currency. The EBA also delegate the decision as to whether the EVE component should be calculated with cash flows including or excluding commercial margins, noting that this should be in accordance with the firm's internal management and measurement approach.

Where a firm does exclude these components, naturally, there is a requirement to do this in a transparent and consistent way. NII cash flows should include commercial margin, however.

Takeaways

- The EBA guidelines on IRRBB come into effect on 30th June 2023 apart from the CSRBB which comes into effect on 31st December 2023.
- Included in the guidelines are two IRRBB technical standards : (i) an update to the SOT; (ii) a defined standardised and simplified standardised methodologies.
- The update to the SOT includes the addition of an NII SOT and a revision to the maturity dependent post-shock interest rate floors in the EVE model.
- The standardised EVE methodology is largely aligned to the standardised methodology from the Basel standard, but the EBA have also developed a standardised NII methodology as well.
- The simplified methodology applies to smaller, less complex institutions.
- These are not mandatory to EU institutions, but a fallback methodology to a firm's own internal methodology / model.
- The EBA's implementation differs to how the PRA have implemented a standardised methodology – not only through the inclusion of the NII methodology, but also in some of the parameters.
- There is no obligation for UK firms to follow the EBA's guidelines, however there may be aspects that firms wish to consider as part of their IRRBB management.

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If you would like to speak to one of our specialists or to understand more about how ALMIS can help you or your firm manage your IRRBB or any other area of ALM, please contact **info@almis.co.uk** or telephone +44 131 452 8898.