### **Basel IRRBB Guidelines – Riding the Rate Curve**



Banks perform important roles in the economy by acting as financial intermediaries whereby they collect deposits from sectors with surplus liquidity and deploy these funds to finance long term development requirements of social and corporate infrastructure of the economy. The deposits typically are short term in nature reflecting general investment appetite and cash settlement requirements of the society while the financing needs are of longer term in nature thereby requiring banks to extend the maturities of their deposits through maturity transformation of their balance sheet. This act of maturity transformation involves building up structural maturity mismatches, pricing and currency basis mismatches on the balance sheet in addition to accommodating customer deviations from contractual terms leading to volatility in earnings and economic value of the bank. These risks involved in maturity transformation are named together as the Interest Rate Risk in the Banking Book (IRRBB).

A dynamic interest rate environment has prevailed since the 2008 financial crisis, during which yield curves in all major economies witnessed multiple steepening and flattening episodes even as short rates stayed at historically low levels. However, at the time of writing this, there are clear indications that a rising rate environment accompanied by a steepening of yield curves has set in given the recent positive GDP and employment data coming out of US, buttressed by strong Fed action.



While the Basel Committee on Banking Supervision ("the Committee") brought out tighter capital standards to improve loss absorption of banks, new liquidity measures to improve liquidity of banking system and issued revised market risk guidelines that prescribed higher capital charges for market risk positions specifically targeting systemic interconnectedness, IRRBB was one major risk that was yet to be addressed. Given this background, the Committee has come out with the long pending revision of the principles and guidelines for managing interest rate risk in banking book with an expectation to be implemented by 2018.

#### Banks are expected to implement the standards by 2018

#### FOCUS OF THE NEW GUIDELINES

The Committee, through the revised guidelines has provided a more specific guidance on measurement of interest rate risk in terms of shock scenarios, behavioural and modelling assumptions, updated standardised framework which could be optionally adopted based on national discretion stricter thresholds for national regulators to identify outlier banks through the Pillar 2 supervisory process and lastly enhanced disclosure requirements to promote consistency and comparability across jurisdictions. To this effect, the guidance issued by the Committee as part of the *"Principles for the management and supervision of interest rate risk, 2004"* has been revised.

- 1. The Committee has laid stronger emphasis on establishing a sound internal risk management framework to identify, measure, monitor and control IRRBB under the oversight of the bank's governing body and tightly integrating this framework with the capital management processes as IRRBB has implications for future capital supply of the bank.
- 2. The principles seek to encourage the usage of both economic value and the earnings-based measures for measurement of IRRBB. While the former is measured using a run-off view, the latter is measured using a rollover view where a constant balance sheet is maintained. Banks may choose to also include dynamic views which take into account their future growth plans for computing these risk measures.

- 3. Banks are to consider multiple scenarios while computing the above measures including rate shocks used in internal ICAAP, historical shocks, hypothetical shocks along with the prescribed shocks in the guidelines. The scenarios are expected to cover market stress situations, parallel and non-parallel shocks, basis divergence, and movement in asset/liability spreads that may breakdown key assumptions.
- 4. The principles highlight the need for more rigorous testing of key behavioural and modelling assumptions in the internal models which should be conceptually sound and reasonable, and consistent with historical experience. A list of dimensions influencing the behaviour being modelled has been provided for each product class. Reverse stress testing is to be adopted to identify weaknesses in the positions and models.
- 5. Increased focus on data accuracy, documentation, testing, auditability, validation and governance of internal measurement models and systems.
- 6. Periodic internal and external disclosures on IRRBB exposures, key measurement outcomes and hedging strategies are to be made. Specific guidance on the basis of preparation for EVE and NII sensitivities for public disclosure purpose has been provided to improve comparability.
- 7. Supervisors are to collect regular information from banks to monitor exposures and assess the soundness of internal models. Stricter rules are to be used to identify outlier banks, e.g. EVE sensitivity over Tier 1 Capital at 15% instead of existing 20% and additional capital requirements can be imposed under Pillar 2 process if excessive risks or inadequate controls are revealed.

**EVE sensitivity:** The change in the net present value of all rate sensitive assets and liabilities under a stressed interest rate scenario as compared to a base scenario as a percentage of Tier 1 capital **NII sensitivity:** The expected change in NII over a shorter time horizon (typically one to three years, up to a maximum five years) resulting from interest rate movements that are composed of either a gradual or a one-time large interest rate shock as compared to a flat rate scenario

### STANDARDISED APPROACH AND ASSOCIATED CHALLENGES

The Committee, despite leaving the implementation of the proposed approach to national discretion, has nevertheless sought to make the approach a benchmark for measuring IRRBB from a regulatory perspective making it a key component of managing banks' IRRBB. In its guidance to supervisors, the committee has recommended that they collect additional information on internal models of the banks, if approved, along with the EVE sensitivity as calculated using the standardised approach. While most banks already have systems that can measure NII and EVE sensitivity on a periodic basis, the reporting requirements under the new standardised approach make it necessary that banks build interest rate behaviouralisation models as prescribed in the guidelines or at the least amend/refit existing internal models to suit the reporting requirements.

# Supervisors are expected to ask EVE measure based on standardised approach even if banks are approved for use of internal models approach

**Classification of balance sheet items:** The first step of the standardised approach pertains to slotting of rate sensitive assets, liabilities and off-balance sheet items into predefined re-pricing buckets. While standard products with defined repricing nature can be slotted directly, less amenable

products like non-maturing deposits or demand deposits (NMDs), prepayments in fixed rate loans, early terminations in term deposits and embedded optionality are subject to interest rate risk behaviouralisation. The guidelines are specific on inclusion of all interest rate sensitive items excluding CET1 capital. The implication is that rate sensitive equity instruments like perpetuals and other hybrid capital instruments that may form part of Tier 1 and Additional Tier 1 will be included as part of

the analysis despite the interest expense of these items not being included as part of NII. It is important to note that the sensitivity of the NII thus computed may differ from the actual accounting NII and could be unfavourable if the re-pricing maturity of the equity instrument falls within the NII measurement horizon. On the other hand, the EVE measure will improve given discounting of additional



balances on the liability side. Another category is the non-performing portfolio which under the approach is to be excluded from the analysis. It may however have a real impact on the balance sheet and earnings as it can start performing again.

#### More granular data requirements for behavioural analysis of NMDs

**Treatment of NMDs:** As NMDs do not have contractual maturity dates, it becomes necessary for banks to assess what percent of the balances would run-off over various tenors. Banks typically classify these deposits into several groups which are expected to behave in a similar manner and

perform a historical balance run-off analysis to observe the behaviour. The change in balance levels can further be analysed with respect to various other factors like interest rates, relationship history, etc. In the first step, the stable portion of balances which are expected to remain undrawn for a long period of time are identified and in the second step, core deposits among these stable deposits



which are unlikely to re-price even under significant changes to interest rate environment are identified. Banks typically model the historical balance run-offs for NMDs categorising them in to current vs. savings and retail vs. wholesale. The guidelines also include transactional vs. non-

transactional category also as well as part of the NMD modelling which will require keeping track of account wise historical transactional data along with balances. The guidelines also talk about introducing a separate category of "non-remunerated deposits" under NMD modelling. It is not clear if current account balances which are typically considered non-rate sensitive are also to be considered as part of interest rate risk behavioralisation of NMDs.

**Divergence between regulatory and internal measures of risk:** The committee has prescribed caps on the portion of deposits that can be considered as core as well as on the average maturity of core deposits. Measurement of interest rate risk under these caps may not reconcile with measurements made under internal models which do not use such thresholds. Special reconciliation analysis may be needed as results from both approaches which are expected to be submitted to supervisors. This further diminishes the natural hedging ability of NMDs and may lead to over-hedging of interest rate risks or curtailing the issuance of longer tenor fixed rate financing. Thus, banks forced to apply the standardised approach may be at a disadvantage compared to banks which are approved to use internal models.

# Caps applicable on slotting of NMD balances in the standardised approach will give a measure which may be very different and conservative compared to the one generated using internal models

Prepayment and early redemption risks found in retail portfolios: Customers are more likely to repay loans earlier than expected when interest rates fall as they are able to refinance them through new facilities at lower costs. Many other factors like competitive pricing, lack of alternative investment options, changes in personal circumstances also lead to early repayments of loans. Similar early termination behaviour is observed for term deposits. Under the standardised approach, firstly, the baseline estimates of loan prepayments and deposit early withdrawals are calculated given the prevailing term structure of interest rates. It is important to note that these base line estimates may be biased depending on the nature of interest rate history prevailing in the observation period. In the second stage, these estimates are multiplied with scenario dependent scalars provided in the guidelines to adjust for expected prepayment/early-termination levels for each of the rate scenarios. Using these estimates, cashflows are amended and sensitivities calculated accordingly. The guidelines specifically talk about prepayments and early terminations where no penalty or cost is charged to the customers that will compensate the bank for the economic cost it incurs. However, most banks typically charge a fixed percent of the outstanding balance for prepayments that may or may not compensate for the economic cost. It is not clear if such cases are to be considered as prepayments and cash flows slotted accordingly. Additionally, there is no guidance on the treatment of prepayment behaviour observed in floating rate retail portfolios with longer tenors and on the continuous rollover behaviour observed in term deposits both of which form a significant majority of the retail portfolios in many jurisdictions.

**Embedded automatic interest rate options:** The guidelines prescribe stripping out embedded automatic interest rate options like rate caps and floors found in all assets, and prepayment options in wholesale assets and liabilities, and be treated together with explicit options. Banks would need to invest in valuation models/tools to perform full revaluation of these options under various rate scenarios for EVE computation.

The question of commercial margins for EVE computation: While it is widely agreed that NII computation will include the full interest income including the customer spreads, there are multiple

ways to compute EVE as acknowledged by the Committee. Banks are given a choice to include commercial margins in the cashflows and if they choose to include the margins, the discounting is to be done using a rate curve which has commercial margins added on top of the risk-free rate. However, both the approaches i.e. excluding and including margins come with their own practical challenges. While stripping out commercial margins from customer positions is not straight forward given varying tenors and credit profiles, adding the commercial margins to the risk-free curve is also prone to judgement, which may lead to either over or under estimating the measure. A third and more accurate approach, albeit being a sophisticated one, would be to use the internal transfer pricing rates for estimating the cashflows. The transfer pricing approach seeks to strip out all other risks other than the business mandated credit risk from the customer pricing, thereby providing a pure view of interest rate and liquidity risks as managed by the ALM/funding center. This approach further helps to mitigate the risk of inflated EVE sensitivity on account of differences in the margins between assets and liabilities.

## The funding center view of cashflows which are based on internal fund transfer pricing provide a more accurate picture of EVE sensitivity

**Static vs Dynamic approach:** Static approach assumes a simplistic scenario where balances that mature simply rollover thereby keeping the balance sheet similar in volume level and term structure. In addition to the prescribed static balance sheet approach, it would be advisable for banks to consider dynamic balance sheet simulation where planned/budgeted balance growth for various product categories is considered for the measurement of earnings volatility to capture the full expected impact of interest rate risk in the short to medium term. Even then, a majority of banking book products and businesses are of a stable nature, and a full review of a dynamic earnings simulation is typically required only as part of a strategic planning exercise. However, such dynamic approach cannot be applied for the EVE measure which considers the balance sheet run-off over the long term and any growth assumptions will not remain realistic over such long term.

Tackling Credit Spread Risk in the Banking Book (CSRBB): The guidelines define a new associated risk component called CSRBB as any kind of asset/liability spread risk of credit-risky instruments that is not explained by IRRBB and by the expected credit risk. While explaining the various components of interest rates, the guidelines refer to various market related general liquidity/credit risk spreads and funding margins inherent in market prices of various instruments that are distinct from pure interest rates and idiosyncratic credit risk spreads. In December 2011, the Financial Stability Institute published a working paper titled "Liquidity transfer pricing: A guide to better practice" highlighting the importance of considering liquidity premium in the internal transfer pricing and suggested a methodology to do so. The funding margin and market related spreads discussed in the new guidelines are similar in nature to the proposed liquidity premium and can be used as a basis to define shock scenarios for the measurement of CSRBB. The guidelines imply through the definitions of interest rate components that it is applicable only to fair valued items on the balance sheet. However, it is also implied that the funding margin which forms part of the internal transfer pricing and applicable on all assets and liabilities also incorporates elements of CSRBB. It is important to note that the funding rate applicable for fixed rate loans show in the below illustration can also be broken down into a base interest rate and a liquidity premium/margin.



Amortised cost items		Items at fair value (mark to market)
Administered Rate	Credit Margin	Idiosyncratic Credit Spread
Funding Rate	Funding Margin	Market Credit Spread
		Market Liquidity Spread
	Reference Rate	Market Duration Spread
		"Risk Free" Rate
Fixed Rate Loans	Floating Rate Loans	Bonds / Interest Earning Securities

**Implications for IT infrastructure:** The interest rate behavioural models require banks to capture more granular positional and transactional data and store it for longer period of time (10 years). These data requirements coupled with analytical requirements could further tax the resources and systems of banks which are already struggling to meet implementation deadlines for other regulations like IFRS 9, Basel III Capital standards and ILAAP requirements. As stated earlier, most banks already have ALM solutions that can compute EV and NII measures. However, what is needed for the implementation of IRRBB guidance is a flexible analytical solution that can sit on top of existing data warehouse or ALM solution and enables development of interest rate risk behavioural models, quick deployment of shock scenarios and computes incremental sensitivities to changes in balance sheet compositions.

#### **FINAL WORDS**

It stands to reason that the rising rate environment coupled with the new regulatory guidelines pose unique challenges for maintaining an optimum balance sheet mix composition that can ensure to preserve NIM in the short term and the overall economic value-add of the balance sheet position in the long term. It is of paramount importance for banks to consider key issues like funding mix, customer tenor preferences, market competition, declining prepayments and run-off pressure on NMDs as they leave the banking system for better investment alternatives. Furthermore, given the dynamic nature of the current rate environment, regulators are most likely to give stronger emphasis on IRRBB through the supervisory review process and non-compliance will not be an option.



Feel free to send your IRRBB related queries to:

#### Sandip Mukherjee

Co-Founder and Principal Consultant Email: sandip.mukherjee@aptivaa.com Phone: +91-98210-41373

### About Aptivaa

Aptivaa is a vertically focused finance and risk management consulting and analytics firm with world-class competencies in Credit Risk, Market Risk, Operational Risk, Basel III, IFRS-9, IRRBB, Risk Analytics, COSO, ALM, Model Risk Management, ICAAP, Stress Testing, Risk Data and Reporting. Aptivaa has emerged as a leading risk management solutions firm having served over 100 clients across 22 countries comprising of highly respected names in the financial services industry.

We can help you through our bouquet of services listed below

- Review of governance and internal risk management framework for identification, measurement, and monitoring of interest rate risk on banking book (IRRBB).
- Review of methodology for EVE and NII sensitivity calculations, updating interest rate shock and stress scenarios and key underlying assumptions driving the IRRBB analysis.
- Development of Interest rate risk behavioral models (Core Deposit Analysis and Prepayment Modeling).
- Assist in developing balance sheet optimizing strategies and arrive at the right balance sheet mix.
- Development of Funds Transfer Pricing (FTP) methodology which can help measure profitability and economic value-added of each business unit.
- Development of methodology to assess and monitor Credit Spread Risk on Banking Book (CSRBB).
- Agile and off-the-shelf analytical solutions that leverage existing ALM solutions to perform on the fly risk analytics to enable better decision making.
- Development of qualitative and quantitative disclosures as required by the regulators.

UAE US UK India