

Navigating the latest RBI guidelines on Interest Rate Risk in the Banking Book (IRRBB): a perspective

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Foreword

EY is proud to present its perspective on the final guidelines released by RBI in February 2023 on Interest Rate Risks for Banking book (IRRBB), which will be applicable to all commercial banks. The new guidelines will replace the previous one on interest rate risk published in 2010 and would require banks to measure, monitor, and disclose their exposures to IRRBB, complying to the new aspects of the mandate.

Inter alia, the new guidance requires banks to: a) Measure their interest rate risk exposures only for the Banking book as against the total book; b) Move to a full revaluation based standardized approach; c) Consider the impact of macro-economic variables in behavioural models.

This paper provides an overview of the key changes from RBI's 2010 guidance, as well as other consideration and challenges that bank may face while developing and implementing their IRRBB framework. Our paper, accordingly, lays out a foundation for banks to better measure, monitor, and disclose their exposure to IRRBB in a robust and timely manner.

It's our hope and expectation that this perspective will provide an extensive information and knowledge to the banks.



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Highlights from the latest guidance

- ▶ Banks should have a clearly defined board-approved risk appetite statement and a framework including policies and procedures for risk measurement, management, monitoring (including limits) and disclosure of their IRRBB exposures
- ▶ A new standardized framework for the computation of EVE has been articulated by RBI, which can be leveraged by banks to benchmark their internal IRRBB framework or may be enforced as the minimum requirement by RBI if banks' internal frameworks are deemed deficient
- ▶ Recommendations on behavioral modeling, w.r.t inclusion of macro-economic variables have been provided for non-maturity deposits (NMD), retail loan prepayments and retail term deposit redemption
- ▶ There is increased regulatory expectation around the development of a sophisticated IRRBB stress testing framework to include forward looking stress scenarios and reverse stress tests
- ▶ Disclosure requirements have been enhanced to include qualitative and quantitative measures with respect to Δ EVE and Δ NII
- ▶ Limits for identifying outlier banks has been changed from 20% of Net worth in 2010 to 15% of Tier 1 capital; breaches of which may result in additional capital requirements or require mitigating actions
- ▶ These limits must also be identified and cascaded to individual business units, portfolios, and instrument types.

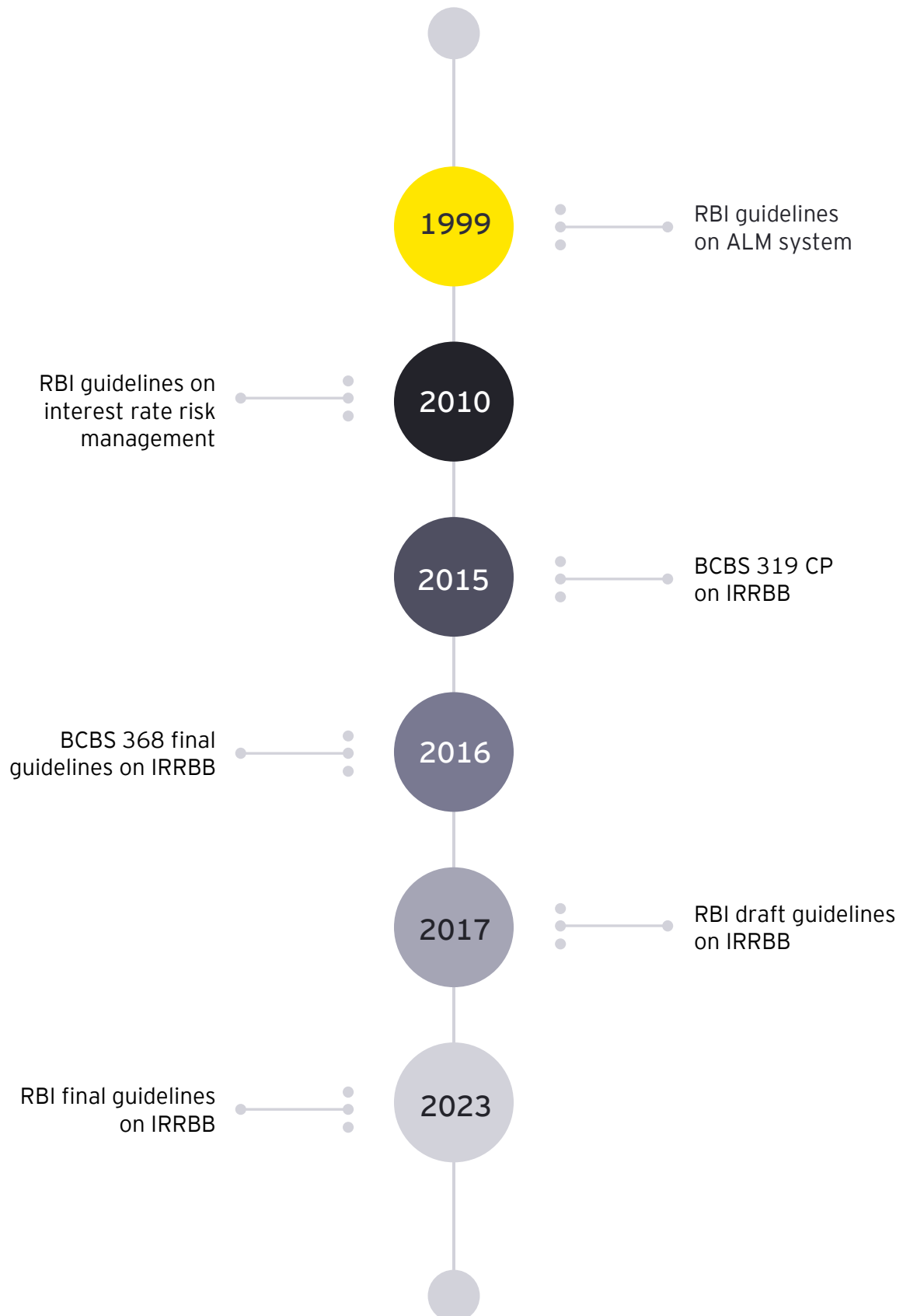
Final guidelines on interest rate risk in banking book

The Reserve Bank of India (RBI) on 17 February 2023 issued the final guidelines on Interest Rate Risk in the Banking Book (IRRBB). The enhanced guidelines require banks to measure, monitor and disclose their exposure to IRRBB based on a set of prescribed interest rate shock scenarios and assumptions on the underlying balance sheet including behavioral assumptions, that in turn

may impact the capital base and future earnings of banks. Notably, these guidelines came out almost six years after the RBI issued draft guidelines in February 2017.

These guidelines are aligned with the BCBS 368 framework and are intended to replace the 2010 guidelines. While the date of implementation is yet to be communicated, banks are now required to submit qualitative and quantitative disclosures for March 2023 (D-SIBs) and June 2023 (Other banks) quarters.

Figure 1: The evolution of IRRBB landscape





Staying ahead of the curve: key imperatives for banks in dealing with interest rates movements

When interest rates change, the present value and timing of future cash flows change. These changes in turn affect the underlying value of banks' rate-sensitive assets, liabilities, and off-balance sheet items and, hence, their economic value (EV). Changes in interest rates also affect banks' earnings by altering interest rate-sensitive income and expenses, affecting their net interest income (NII). Enhanced guidelines will have impact on NII and Economic value of equity (EVE) calculations due to:

- ▶ Intermediation activity that produces exposures to both maturity mismatch (e.g., long-maturity assets funded by short-maturity liabilities) and rate mismatch (e.g., variable rate loans funded by fixed rate deposits).
- ▶ Non-maturing deposits and term deposits subject to run-off risks and fixed-rate loans, commitments that pose significant prepayment risk will need to be modeled taking macroeconomic variables into account to determine repricing profile
- ▶ Further, the optionality embedded in banking products that are triggered by the changes in interest rates will assert influence on banks' interest rate risk profile.
- ▶ Banks must, therefore, be familiar with all elements driving IRRBB, and take appropriate steps to identify, measure, monitor and control these risks.

New vs. old: understanding the key differences between RBI guidelines on IRRBB from 2010 and 2023

Governance and controls:

Banks are now required to have a clearly defined board-approved risk appetite statement (RAS) which lays down policies and procedures for limiting and controlling IRRBB.

Banks need to define their risk appetite with respect to IRRBB, in terms of both earnings and value of equity and establish policies and procedures to enable banks to identify, manage, monitor, and mitigate interest rate risk in existing exposures and new products. A comprehensive limit framework must be established to monitor interest rate risk over varying rate cycles, including the risks embedded in marking-to-market instruments used for hedging.

Data integrity and IRRBB measurement:

Measurement systems and models used for IRRBB should be based on accurate, complete, and timely data, and subject to appropriate documentation, testing and controls to lend assurance on the accuracy of calculations. Data availability and granularity will be an important factor across all the below elements related to IRRBB measurement.

- ▶ **Exposures in scope:** The final rules clarify that only interest rate sensitive exposures in the banking book are now in scope of IRRBB measurement, unlike 2010 which considered the entire balance sheet.
- ▶ **Measurement approach:** The measurement of interest rate risk is now based on a full revaluation approach, which is a significant departure from the sensitivity-based approach outlined in 2010 that utilized traditional gap approach and modified duration to assess the impacts on NII and Market value of equity (MVE) respectively.
- ▶ **Interest rate shocks:** The RBI has prescribed six interest rate shocks scenarios (Appendix 1 of the circular) across over 20 currencies; both parallel and non-parallel shocks are applicable for EVE, but only parallel shocks are applicable to NII. Further to the prescribed shocks, banks are also expected to define and measure IRRBB based on:
 - ▶ internally selected shocks
 - ▶ historical and hypothetical interest rate stress scenarios
 - ▶ forward looking shocks
 - ▶ as well as any additional shock scenarios requested by the RBI
- ▶ **Dynamic modeling technique:** Banks should consider a variety of methodologies to quantify their IRRBB exposures ranging from simple calculations based on statistical simulations using current holdings to more sophisticated dynamic modeling techniques (if feasible) that reflect potential future business activities.
- ▶ **Automatic interest rate options:** The treatment of automatic interest rate options is specifically prescribed in the revised guidelines. Both explicit and embedded optionality should be identified and evaluated for both Balance sheet and off-balance sheet products. Such options are subject to full revaluation under each scenario for each currency. Changes in values of options are then added to Δ EVE under each shock scenario on a per currency basis.
- ▶ **Notional repricing of cash flow:** Interest payments or the spread component of interest payments on the principal outstanding that has not yet been repaid or repriced, needs to be slotted at their contractual maturity irrespective of whether the non-amortized principal has been repriced or not.
- ▶ **Standardized approach (SA):** The final rules also include an indicative standardized methodology for computing change in EVE (Δ EVE) consisting of five steps:
 - ▶ Categorization of exposures as amenable, less amenable, and non-amenable to standardization
 - ▶ Slotting of cash flows based on repricing maturities
 - ▶ Calculation of Δ EVE by currency and six prescribed shock scenarios
 - ▶ Add-on for exposures with embedded optionality
 - ▶ Calculation of EVE as the largest reduction in Δ EVE across shock scenarios



Modeling assumptions and validations:

Products with behavioral optionality viz. a) Fixed-rate loans subject to prepayment risk; b) Fixed rate commitments subject to drawdown; c) Term deposits subject to early redemption risk; and d) non-maturity deposits (NMDs) subject to repricing under varying interest rate environments now need to be modeled for dynamic movement of interest rates.

- ▶ **Variables:** The final guidelines list additional dimensions having macro-economic variables that are likely to influence the exercise of the embedded behavioral options and recommend that banks consider those while develop modeling assumptions for related portfolios. Since new guidelines required risk to be measured at the currency level, and yield curves vary from currency to currency, banks need to assess behavioralization of exposures at the currency level.
- ▶ **Key assumptions:** All modeling assumptions should be thoroughly documented and tested in line with the firm's model risk management standards. Assessment of the appropriateness of key behavioral assumptions should be undertaken via the benchmarking of the internally calculated IRRBB metric against the indicative standardized framework.,
- ▶ **Granularity:** For modeling purpose, banks would need historical daily granular position level data on exposure values, maturity dates, reset dates, interest rates, partial and full prepayments of loans, early redemptions of term deposits, etc.
- ▶ **Model risk management included in the policy:** A robust model risk framework, including an independent validation function or a framework for third party validation of IRRBB models should be included in the formal policy and reviewed/ approved by the Board or appropriate committee (e.g., Asset Liability Committee (ALCO)). Modeling assumptions should be routinely monitored as part of ongoing performance monitoring for applicability against evolving economic and market conditions.

Stress testing framework:

Banks need to develop and implement IRRBB stress testing framework commensurate with their size, complexity, and risk profile. The guidelines and expectations around stress testing have significantly increased from those issued in 2013.

- ▶ The IRRBB stress testing should be considered in the ICAAP and requires banks to consider **forward-looking scenarios**. The framework should identify events of severe changes in market conditions that could adversely impact the bank's capital or earnings. These could also be possibly through changes in the behavior of its customer base.
- ▶ **Stress scenarios:** When developing the scenarios, banks must consider relevant factors, such as the currency, shape, and level of the current term structure of interest rates and the historical and implied volatility of interest rates. In low interest rate environments, banks may also consider negative interest rate scenarios and their effects on assets and liabilities. Further, while developing stress scenarios, banks must consider scenarios that are sufficiently wide ranging, focus on portfolios with concentrations, include exercise of options if material and evaluate scenario that would impacts other risk stripes (e.g., credit risk from large positive interest rate shocks or liquidity risk from reduced inflows on loan portfolios)
- ▶ **Reverse stress test*:** Banks are expected to perform qualitative and quantitative reverse stress tests. These tests must assume a severe worsening of capital and earnings to reveal vulnerabilities that may arise due to hedging strategies and customer behavior.

**Reverse Stress tests means an institution stress test that starts from the identification of the pre-defined outcome (e.g., points at which the business model becomes unviable) and then explores scenarios and circumstances that might cause this to occur*

Capital assessment for IRRBB under pillar 2:

The overall level of capital should be commensurate with both the bank's actual measured level of risk (including for IRRBB) and its risk appetite and be duly documented in its ICAAP report.

- ▶ **Capital requirements** will be assessed based on the worst possible outcome across both standardized and internal shock scenarios. Capital assessment of IRRBB should be considered in relation to economic value and future earnings.
- ▶ **Outlier assessment:** Banks must monitor their capital requirements against the new reduced outlier threshold of 15% for ΔEVE as a percent of Tier 1 capital (In 2010, the outlier limit was 20% of Net worth). Banks breaching this threshold may be required to raise additional capital, reduce IRRBB exposure by hedging or enhancing their IRRBB frameworks.

Reporting and disclosures:

Ahead to implementation, RBI requires banks to submit the quantitative disclosure for the quarter ending March 2023 for D-SIBs and quarter ended June 2023 for non-D-SIBs within two months from respective quarter end. These disclosures are expected to be reported on a quarterly basis, at least for the initial phases of implementation.

Qualitative disclosures should include:

- ▶ Risk management objectives and policies that address the purpose, control process, periodicity of calculation, interest rate shock scenarios and assumptions considered.
- ▶ Hedging details with respect to IRRBB and other qualitative factors, as mentioned in the circular
- ▶ High-level description of key modeling and parametric assumptions and limitations pertaining to behavioral modeling of NMDs, prepayment of fixed-rate loans and redemption of term deposits.

Quantitative disclosures should include:

- ▶ Impact on EVE and NII considering six regulatory scenarios for both the current and previous reported period.
- ▶ They should also contain details on the average and longest repricing maturity assigned to NMDs.

Mastering the complexities: navigating key considerations and challenges in implementing IRBBB

The new guidelines will be complex to implement for banks with material exposure to interest rate risk. As a result, firms should take a strategic view and consider implementation of a strategic system or solution to comply with these guidelines. While many solutions/ vendors may claim to be plug-and-play, risk methodologies and approach often differ due to bank's size, along with data availability and interpretation issues. This section outlines some key areas of focus for banks.

Commercial margin: For the standardized EVE calculations, banks will need to assess the impact of inclusion / exclusion of commercial margins. The standard practice is to use commercial margin for cash flow projections and hence the commercial margin should be added to the risk-free rate for discounting.

Average maturity and maturity profiling of NMD: The RBI has prescribed caps on the percentage of core deposits and average maturity by deposit category. Banks will need to develop a defensible approach to profile their deposit portfolio using accurate macro-economic variables.

Interest rate sensitivities: Banks need to identify how the rate-sensitive assets and liabilities are impacted due to change in interest rates. Rate sensitivities may change based on the magnitude of the rate shock. Modeling assumptions should factor this. For instance, NMD run off may change due to change in the interest rate. The NMD model or framework should be robust enough to capture this changing sensitivity.

Hedging strategy and investment decisions: Banks will now need to consider appropriate hedging strategies, identify the instruments to hedge, length or period of hedge and assess their effectiveness in managing IRRBB. IRRBB needs to be managed by the Bank's Treasury, either via balance sheet re-alignment or hedging (in case of EVE impact beyond internal or regulatory limit).

Implementation challenges: Banks will have additional considerations in terms of data integrity, historical data maintenance, cost of funding/ Funds Transfer Pricing (FTP)* computation, product lives (maturity) and cash flow modeling, etc. Reform cost will arise from implementation of the revised guidelines. Additionally, banks should focus on system capability upgrade to handle a range of scenarios, higher tenure analysis, and granularity of data.

**FTP intends to immunize the business units from liquidity risk and interest rates by transferring those risks to a Central Funding Unit (CFU). The Base curve, a key component of the FTP curve, is aligned to the repricing frequency of the asset or liability. Additionally, the calculation of commercial margins is an outcome of transfer pricing. The new IRRBB regulations require banks to re-assess the repricing of various assets and liabilities as per the new methodology. Therefore, banks may need to re-align their FTP framework of various products, taking this into consideration.*

Dynamic approach: RBI has recommended banks to explore dynamic balance sheet modeling to assess their IRRBB exposure. Banks should aspire to project the balance sheet using advanced forecasting models. As an alternative, banks can re-purpose their Board level balance sheet projections for this purpose. Although this is not a must have or immediate requirement, dynamic balance sheet forecast will help bank project their NII more accurately. However, such models are complex to develop and are data/ infrastructure intensive.

Magnitude of shocks vis-à-vis defined in BCBS 368: The magnitude of interest rate shocks provided for INR and some of the other currencies vary from those in the Basel guidelines. For such currencies, banks would need a framework in place to report both sets of shocks and any modifications to the magnitude of the shocks based on the country/ purpose of reporting.



Driving forward: banking strategies for success

Banks should approach the latest guidance with the intent of developing a robust and strategic framework for balance sheet management over a long term. Accordingly, they may consider the following:

Book separation: Banks will need to undertake a clinical process to capture only their banking book exposures for IRRBB measurement and management. The boundaries between the banking and trading books, the extent and restrictions on moving instruments across regulatory books are provided in the **draft guidelines on minimum capital requirements for market risk** in Feb 2023. However, banks are expected to follow the existing guidelines for book segregation for now and would need to revisit this classification in light of the new guidelines again in the future. The delineation between banking book and trading book should be clear.

Data granularity: Banks will need to evaluate their existing data management and governance framework to ensure they are able to provision and store appropriately granular historical data including contractual maturity, associated optionality, early maturity dates, other attributes as required for behavioral modeling etc., while also meeting expected data quality requirements.

NII stabilization: IRRBB can be used to achieve Bank's Board of Directors (BoD) targeted NII stabilization. This should be mapped according to an optimal level of NII required to achieve an expected interest rate outlook over the next one to two years. Furthermore, residual interest rate risk can be hedged by using interest rate swaps (IRS) or other derivative instruments.

Measurement approach: Banks may adopt standardized approach (SA) in accordance with the directive from RBI. Banks are, however, permitted to construct their own internal approach, but these cannot deviate substantially from the procedures outlined in the SA. The SA technique is expected to assist banks with benchmarking their internal models. Basel standard and revised RBI guidelines expect IRRBB to be measured across three risk types – gap, basis, and options. Banks would need to attribute and identify how each risk type is contributing to a bank's interest rate risk.

Model validation: Banks should ensure that any existing IRRBB models are identified and validated in line with the firm's risk management policy. New model requirements such as behavioral models (NMD, prepayment, redemption models) or their enhancements should be inventoried and mitigating actions, until such models are in production, should be identified and implemented. Their integration with bank's IRRBB framework is expected to capture deposit repricing and early redemption, prepayment of assets and other optionality. This will need stronger scrutiny and validation support on an ongoing basis.


How can EY Help?

EY has extensive experience in developing and implementing IRRBB solutions for global as well as Indian banks and has evolved greatly with respect to IRRBB identification, measurement, and management. EY can help banks in the following areas to implement their short-term immediate reporting requirements as well as achieve a long-term strategic, robust, and scalable IRRBB framework.

Table 1: Areas where EY can support

#	Area	EY support
1	Governance	Define/ enhance the governance framework, RAS, policies, and procedures as per new regulations.
2	TB/BB Boundary	Establish a book separation mechanism to clearly identify trading and banking book (TB/BB) boundaries. Ensure proper classification and mapping of TB/BB exposures in the models and systems.
3	Behavioral modeling	Develop modeling methodology (inclusive of macro-economic variables) and key assumptions for interest rate sensitivity.
4	IRRBB Measurement methodology	Develop IRRBB measurement tools (across multiple platforms like excel, python etc.) transitioning from sensitivity-based approach to full revaluation approach.
5	Stress testing and Capital assessment	Establish a robust stress testing framework considering forward looking stress scenarios and internal shocks and assess capital requirement basis IRRBB exposures.
6	Reporting and disclosures	Establish a reporting framework for timely and accurate regulatory submissions and disclosures at required granularity.
7	Strategic tool in vendor platform	Partner in implementing the end-to-end strategic in-house/ vendor system from defining requirements, model hosting, solution configuration and system testing for IRRBB measurement and modeling.
8	Model Validation	Perform independent validation exercise of the IRRBB models across areas such as behavioral models, prepayment/ early redemption models, calculation of NII/EVE impacts as per the standardized approach.

Final thoughts:



It is important for the banks to consider IRRBB as not just a reporting metric but a strategic measure to manage the balance sheet and profitability. EY anticipates that the new requirement on behavioral modeling may become a major concern for banks as there may be significant data challenges in building the models for NMDs and other products. Therefore, banks need to first identify a comprehensive list of gaps against the latest regulatory requirements before considering any tactical or strategic solutions, post which develop solutions to address the gaps and any imminent short-term requirements as well as fundamental changes in how IRRBB is being identified, measured, and monitored. This will aid banks in building a robust IRRBB framework.

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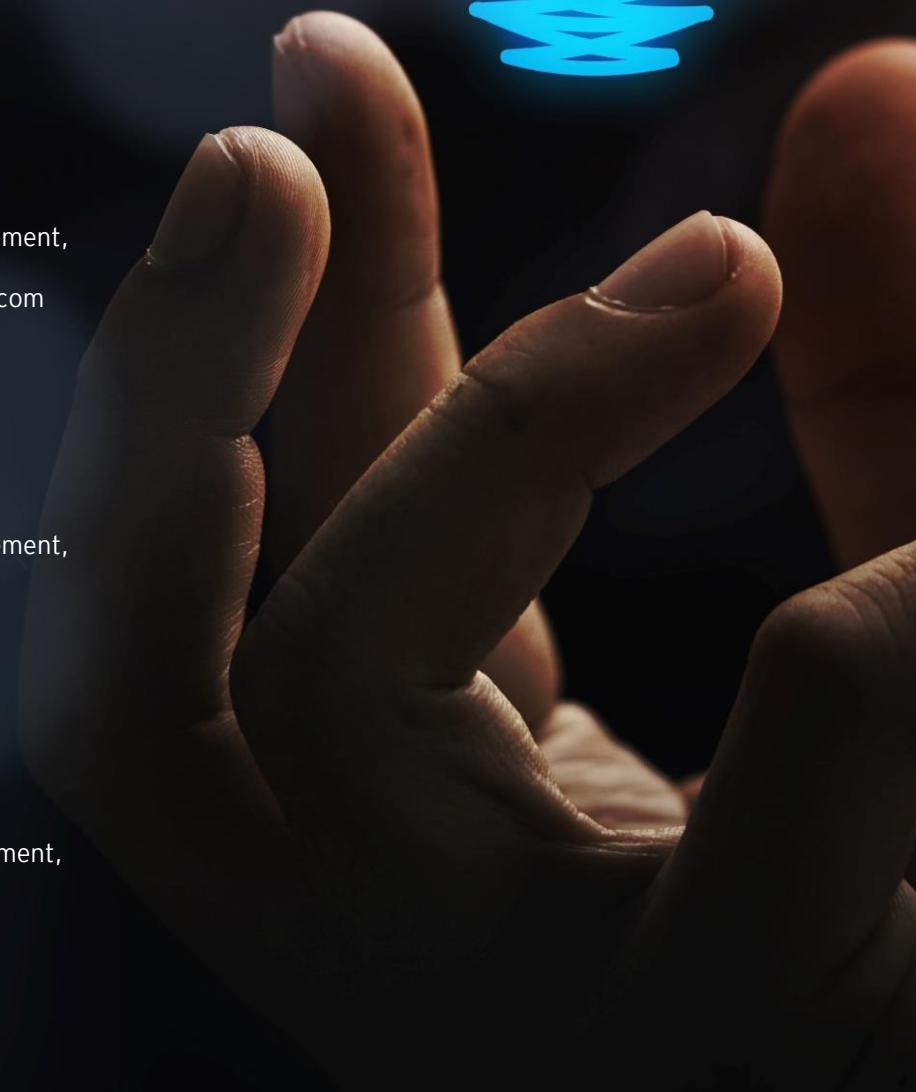
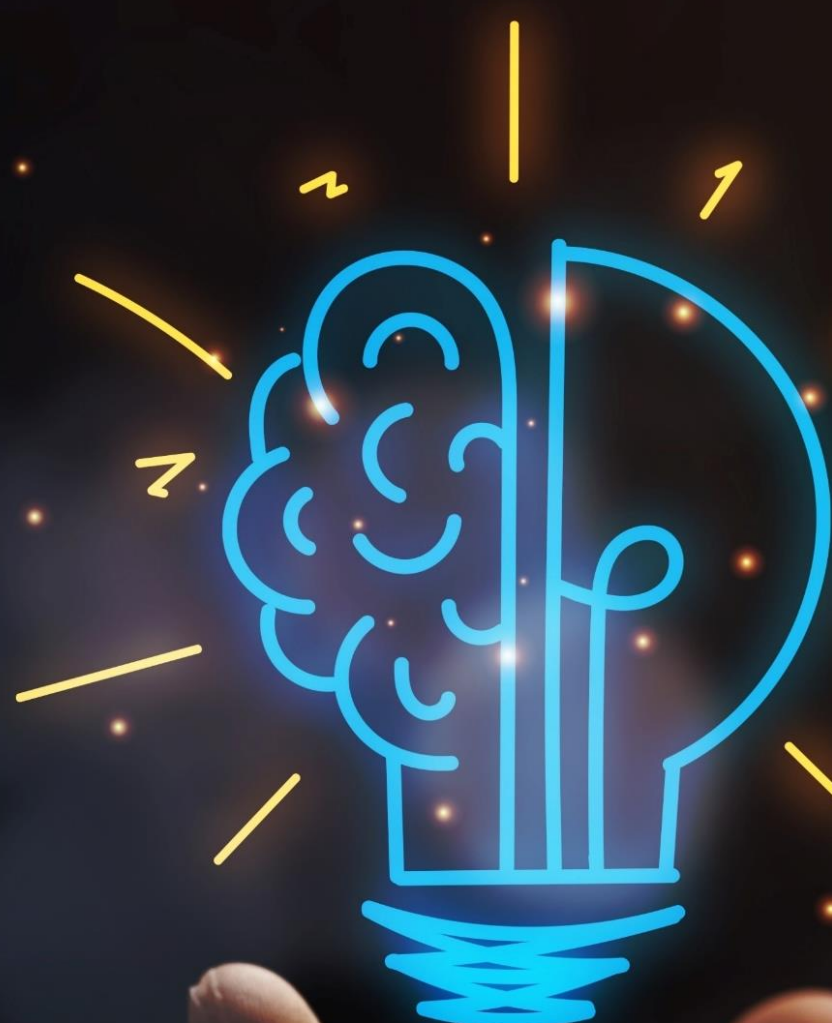
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