

IRRBB Series: Margin Optimisation for Duration Analysis

August 2025

I. Managing IRRBB in Your Organisation

Mastering deposit dynamics: unlocking stability and profitability through duration analysis

In today's volatile rate environment, safeguarding interest rate margins and effectively modelling deposit behaviour have become both more complex and more essential. Traditional maturity profile approaches - whether historically derived or qualitatively assessed - often lack the agility or governance rigour required to keep pace with volatile market dynamics. This publication introduces a replication based modelling technique for deposit duration modelling, adopted by ECB-regulated institutions, designed to strengthen regulatory engagement and support informed balance sheet decisions. We outline the underlying rationale, summarise the model framework and explore practical implementation within your institution.

II. Why Margins are Under Pressure

1. Behavioural Complexity of Core Deposits

While often perceived as resilient, core deposits are subject to behavioural and macroeconomic influences, including demographic changes, retirement trends and evolving lifestyle patterns. To estimate deposit longevity, banks commonly apply a linear run-off profile based on Weighted Average Life (WAL). Given its impact on Net Interest Income (NII) and Economic Value of Equity (EVE), WAL holds strategic significance across financial planning and asset-liability management.

2. Regulatory Constraints & Risk Metrics

Under EBA/GL/2022/14, banks are required to evaluate both NII and EVE to effectively manage interest rate risk. To constrain exposure, The European Banking Authority (EBA) imposes a five-year cap on the volume-weighted average duration of core and non-core deposits. This requires banks to balance the income stability afforded by longer WALs with the increased valuation sensitivity they introduce under EVE assessments.

3. Modelling Techniques & Adaptability

To estimate WAL, banks employ a range of modelling approaches, including survival analysis, Markov chains, and regression-based techniques. Increasingly, institutions are integrating machine learning frameworks - where governance permits - to capture complex, non-linear behavioural patterns. A key challenge in these methodologies lies in adapting to evolving customer behaviours and macroeconomic shifts, such as Ireland's ageing demographic profile and the anticipated impact of the "My Future Fund" auto-enrolment scheme.

4. Strategic & Supervisory Integration

Managerial oversight remains critical in complementing quantitative deposit models with qualitative factors such as product strategy and client segmentation. The Central Bank of Ireland's 2025 outlook underscores the importance of integrated supervision and proactive resilience, elevating deposit modelling to a strategic function that bridges governance, consumer protection, and financial stability.

III. Facing These Challenges

In practice, regulators expect banks to underpin maturity profile decisions with diverse and well-justified analytical approaches. Beyond standard modelling techniques, institutions are increasingly expected to provide the following:

How do Banks Determine an Appropriate Maturity Profile for their deposits?

Qualitative Considerations

1. Desired level of NII stability
2. Tolerance for balance sheet duration risk
3. Capital efficiency targets
4. Regulatory limits on hedge duration or swap notional
5. Internal policy limits

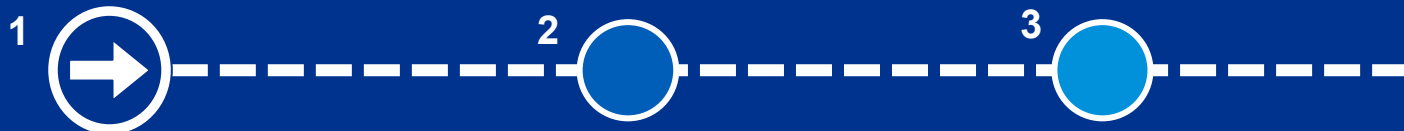
Quantitative Measures

1. Modelled decay factors
2. Realised volatility of deposit balances
3. Historical minimum balances
4. Scenario analysis
5. Transaction frequency and cash flows

Key Takeaway: For effective deposit modelling, Banks must utilise many tools to determine realistic, defensible maturity profiles.

IV. Replicating Deposits – How it Works at a High Level.

We provide a tailored, interest rate risk management solution, designed to enhance strategic decision-making across treasury operations. This section outlines the core methodology in its simplest form.



Overview

To address the identified challenges, we employ a pragmatic approach through a portfolio replication methodology. This innovative framework enables effective interest rate risk management within deposit portfolios and is recognised by regulatory authorities. Notably, it has demonstrated success in duration analysis and portfolio structuring across institutions supervised by the ECB.

Key Concept: Replicating portfolio

A collection of assets designed to mirror the payoff profile of a target financial instrument. By combining simpler, well-understood components, the resulting portfolio can emulate the cash flow characteristics of the original instrument. This principle offers a compelling framework for modelling deposit portfolios.

Balance Sheet Segmentation

The behavioural replication of these deposits must account for the differing dynamics between core and non-core NMDs. A clear understanding of balance sheets stability is essential to determine meaningful insights from the analysis. To support this, we first define the following relevant terms:

Replicating Deposits: Core vs Non-Core

Deposits serve as a primary funding source and income driver, but their economic profiles vary substantially based on customer behaviour, rate sensitivity, and tenor expectations.

Core Deposits

Core deposits are stable and long-term, making them suitable for replication through a rolling portfolio of vanilla interest rate swaps. These swaps are evenly distributed across maturity buckets and progress through a “maturity ladder” as they expire. Each swap’s yield reflects its tenor and the prevailing rate at initiation, offering a smooth income profile and consistent duration alignment.



Non-Core Deposits

Due to their inherent volatility, non-core deposits are only replicated using the shortest available tenor. Within our framework, monthly euro-denominated balances are invested at the overnight rate - specifically via the 1-month €STR - ensuring immediate rate responsiveness and reflecting their short-term behavioural nature.



Data Requirements

Effective replication requires time series data on deposit balances, associated interest payments, and historical overnight rates in the relevant currency. These inputs support behavioural analysis and yield modelling.

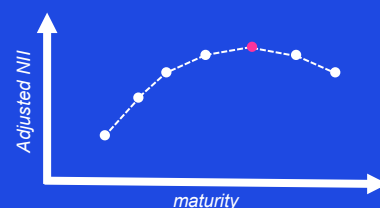
Replicating each deposit type

Non-core deposits, being less stable, are replicated at the prevailing overnight rate to reflect their short-term nature. In contrast, core deposits are allocated to term instruments that may offer higher yields. Our replicating portfolio is designed to capture this behavioural divergence.

Determining Performance

With all components established, we calculate net interest income (NII) and its volatility across the portfolio. This allows us to derive a volatility-adjusted NII metric - the core performance measure of our framework. Optimisation of this metric informs the portfolio’s ideal duration profile.

$$\begin{array}{rcccl} \text{Income from} & & & & \\ \text{Non-Core} & + & \text{Income from} & - & \text{Interest} & = & \text{Net interest} \\ \text{Deposits} & & \text{Core Deposits} & & \text{Payments to} & & \text{Income (NII)} \\ & & & & \text{Clients} & & \\ \hline & & \text{NII} & = & \text{Vol Adjusted NII} \\ & & \text{NII volatility} & & \end{array}$$



We can run simulations for different investment horizons to obtain the optimal adjusted NII figure for your book

VI. How KPMG Can Help

The replication strategy is one part of our broader modelling toolkit. Our experts tailor maturity profiles to meet regulatory standards across several dimensions. Applications include:

Assessing maturity profiles from a regulatory viewpoint.

Reviewing governance frameworks/policies in your organisation

Implementing duration analysis techniques

Validating existing NMD Models – Core/Stable, WALs, or Migration



We bring first-hand experience collaborating with peer institutions to build, validate, and implement robust IRRBB frameworks. Our track record spans the full lifecycle - from model design to assurance and regulatory alignment - ensuring effective interest rate risk management tailored to each client's unique balance sheet dynamics.

KPMG's Proven Delivery with Trusted Institutions

IRRBB Modelling

Delivered IRRBB models that quantify interest rate sensitivity via Net Interest Income (NII) and Economic Value of Equity (EVE). These insights translate regulatory requirements into actionable frameworks—supporting margin stability and proactive risk management.

ALM Framework Review

Supported a European GSIB in aligning behavioural deposit assumptions with balance sheet strategy to enhance margin stability across interest rate cycles. Key interventions included recalibrating WAL to address regulatory gaps and redesigning funds transfer pricing (FTP) mechanisms to improve pricing precision.

Internal Audit & Oversight

Conducted an independent review for a domestic bank's IRRBB behavioural models, validating WAL assumptions and evaluating model governance. The assessment supported alignment with regulatory expectations and reinforced internal control standards.

Key Takeaways



An effective choice of maturity profile requires multiple analytic approaches to meet regulatory expectations and ensure robust risk representation.



The replicating portfolio approach to duration analysis has proven effective across multiple ECB-supervised institutions.



We can partner with you to deploy these methods, strengthening your IRRBB framework and enhancing risk management.

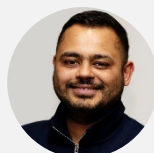
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