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The EVE/NII Trade-off in IRRBB: structural drivers, regulatory context and implications for ALCO

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Executive Summary

Interest rate risk in the banking book (IRRBB) is measured from two angles: the economic value of equity (EVE), which looks at the present value of the whole balance sheet, and net interest income (NII), which looks at earnings over roughly the next twelve months. Because the two measures differ in horizon, discounting and behavioral assumptions, a hedge that stabilizes one can leave the other exposed or even worsen it. The collapse of Silicon Valley Bank in 2023 showed how economic value can deteriorate for some time while reported earnings still look healthy.

This document explains where that tension comes from, how the Basel and EU frameworks now require both measures to be assessed jointly, and, through two small examples, when a hedge can improve both measures and when a bank faces a genuine trade-off. The key message for ALCOs is that EVE and NII limits should be set and managed together, that hedge design should be treated as a single problem subject to both constraints, and that the behavioral assumptions for deposits and prepayments should be governed as the main link between the two.

1. Introduction

IRRBB has re-entered the center of prudential and regulatory attention, but also as a strategic and core focus for banks. After more than a decade characterized by a “lower for longer” monetary policy environment, the rate hiking cycle in 2022 exposed weaknesses in how banks measure, monitor, and hedge IRRBB, contributing materially to Silicon Valley Bank's sudden collapse in March 2023. The Federal Reserve's own postmortem on SVB concluded that the firm was highly vulnerable in ways its board and senior management did not fully appreciate, and that supervisors did not fully understand the extent of those vulnerabilities as the bank grew rapidly in size and complexity (Federal Reserve, 2023). Signature Bank failed in the same week, but the FDIC's own review of that failure attributes it principally to poor management, an over reliance on uninsured deposits, and liquidity shortcomings rather than documenting the same interest rate duration mechanism identified at SVB (FDIC, 2023); the two episodes should accordingly be read as related but analytically distinct, not as a single documented mechanism repeated across banks.

The diagnosis has been broadly corroborated at the cross jurisdictional level by the Basel Committee's own stock take of the wider 2023 banking turmoil, which likewise identifies IRRBB and liquidity risk as areas warranting continued analytical follow up (BCBS, 2023). The deterioration in economic value of equity, driven by substantial unrealized losses in available for sale and held to maturity portfolios as rates rose, was a significant contributing factor at SVB specifically, but not the whole story, the failure also involved a concentrated, uninsured deposit base, a rapid loss of depositor confidence, and supervisory

and governance shortcomings, which together converted a balance sheet vulnerability into a liquidity run. Reported net interest income, notably, remained largely undisturbed for a period of time even as economic value deteriorated, a relevant and crucial divergence for the scope and purpose of the present document.

The divergence between the two principal metrics used to assess IRRBB, the economic value perspective, captured by the change in economic value of equity (ΔEVE), and the earnings perspective, captured by the change in net interest income (ΔNII), is not incidental. It is the natural consequence of the fact that the two measures answer different questions, over different time horizons, using different discounting conventions, and with materially different treatment of non-maturity deposits and prepayment intensity. These concepts, the economic value and earnings perspectives and the behavioral assumptions that link them, are explained in detail within the IRRBB framework in Chapter 13 of Choudhry (2018), which provides a comprehensive practitioner treatment of interest rate risk in the banking book.

The Basel Committee's IRRBB standard has for some time defined IRRBB itself in terms of both capital and earnings; within the European Union specifically, the European Banking Authority's 2022 guidelines and the subsequent 2024 Regulatory Technical Standards on supervisory outlier tests further formalized this joint assessment for EU supervised entities, introducing an explicit NII supervisory outlier test alongside the pre-existing EVE test, rather than leaving EVE and NII as independent ALCO core risk indicators.

2. Regulatory Background

2.1 Definitions

Under the Basel Committee's IRRBB standard, first issued in April 2016 (BCBS, 2016) and since integrated into the consolidated Basel Framework, IRRBB is defined as the current or prospective risk to a bank's capital and earnings arising from adverse movements in interest rates affecting the banking book (BCBS, 2016). Two complementary measurement approaches are prescribed. Economic value (EV) measures the change in the net present value of the balance sheet under a stress scenario; as equity is excluded from the discounting exercise, the resulting metric is the economic value of equity (EVE) or the difference between the present value of asset cash flows and the present value of liability cash flows, evaluated under the current and each stressed yield curves. On the other side, earnings-based metrics compute the change in expected net interest income (NII) over a short to medium horizon, incorporating projected repricing, margins, and in dynamic models, assumptions about new business.

Both measures are affected by common assumptions, such as the balance sheet itself, the range of prescribed interest rate shocks, the behavioral treatment of non-maturity deposits (NMDs), and the exercise of automatic and behavioral options, but they diverge in other relevant aspects such as the outcome measure, time horizon, and discounting.

Dimension	EVE (economic value)	NII (earnings)
Horizon	Full remaining life of all cash flows (to final maturity)	Short to medium term, typically 12 months
Objective / target variable	Present value of equity (assets minus liabilities, discounted)	Projected net interest income over the horizon
Balance sheet assumption	Run-off: no new business assumed	Constant balance sheet under regulatory NII SOT; dynamic, with new business, for internal ALCO models
Discounting	Full cash flow discounting at the risk-free curve	Not discounted; margins and volumes projected at nominal rates
Behavioral drivers	NMDs behavioral maturity, prepayment adjusted duration	Deposit Beta, NMDs behavioral maturity, prepayment adjusted duration
Shocks	Six BCBS scenarios (parallel up/down, steepener, flattener, short rate up/down)	EBA parallel up and parallel down scenarios (NII SOT); full six scenario set for internal monitoring
Principal management use	Capital adequacy, long run solvency, duration/hedge design	Budget and earnings stability, near term margin management

Table 1. EVE and NII compared

2.2 The standardised EVE framework

The BCBS standardized approach computes ΔEVE through five stages: classification of positions as prone, less prone, or not prone to standardization; slotting of notional cash flows into nineteen prescribed time buckets; computation of ΔEVE under six prescribed shock scenarios (parallel up/down, steepener, flattener, short-rate up/down); addition of automatic option value changes; and selection of the maximum EVE loss across scenarios, which is compared against a materiality threshold of 15% of Tier 1 capital (BCBS, 2016; BCBS, 2024).

The shock magnitudes underlying these six scenarios were themselves recalibrated by the Basel Committee in July 2024, with implementation set for 1 January 2026 (BCBS, 2024). The recalibration, which incorporates market data through December 2023, replaces the single global calibration with currency specific parameters derived from absolute interest rate changes over rolling six-month windows and moves from the 99th to the 99.9th percentile of that change distribution (not of historical rate levels).

2.3 The EBA's 2022 guidelines and the supervisory outlier test

The European Banking Authority's Guidelines on the management of interest rate risk and credit spread risk arising from non-trading book activities (EBA/GL/2022/14, published 20 October 2022) extended the supervisory outlier test to assess shocks to both EVE and NII, whereas earlier practice concentrated primarily on EVE outliers. The 15% of Tier 1 capital EVE materiality threshold, and the mandate for a separate NII threshold, derive from Article 98(5) of Directive 2013/36/EU (the CRD), as amended;

Commission Delegated Regulation (EU) 2024/856, adopted 1 December 2023 and published 24 April 2024, does not create these thresholds but instead sets out, as regulatory technical standards under that Directive's mandate, the methodology, shock magnitudes, and common modelling and parametric assumptions for both tests, and specifies in its Article 5(1) the NII "large decline" threshold at 5% of Tier 1 capital, an upward revision from the 2.5% originally proposed in the EBA's draft RTS, formalizing the joint EVE/NII outlier test that this document takes as its point of departure.

Because this Regulation was adopted before the Basel Committee's July 2024 recalibration of the standardized IRRBB shock scenarios (BCBS, 2024; Section 2.2), the two should be read as distinct developments rather than one transposing the other. The introduction of a separate NII threshold has made the interaction between economic value and earnings sensitivity an explicit supervisory and governance consideration. Institutions must therefore assess whether actions taken to reduce the EVE outlier measure create or increase exposure under the one-year NII test, and vice versa; unlike the CRD itself, which as a Directive requires national transposition, this Delegated Regulation has direct effect across the EU upon entry into force, 14 May 2024, and does not depend on further national transposition.

3. Anatomy of the Trade-off

3.1 Why the two measures diverge

The two metrics differ in a way that is intuitive from a bank’s balance sheet management perspective before it is formalized below. EVE revaluates the entire balance sheet, including positions that are not marked to market in accounting terms, such as the loan book or held to maturity bond portfolios, by discounting their contractual cash flows at the prevailing curve, higher rates discount these cash flows more heavily and so reduce their fair value, and the impact grows with the position's maturity, which is why long dated exposures such as mortgages or long term bonds dominate EVE sensitivity.

NII, by contrast, evaluates the impact on the financial margin over a near term horizon: a rise in rates on floating rate assets, for instance, benefits the bank's income almost immediately, since those assets reprice upward before any offsetting increase in funding costs catches up. In this context, a very same rate movement can therefore look, at once, like a loss of economic value and a gain in near term earnings, the two management logics point in opposite directions precisely because they are asking different questions of the same balance sheet.

3.2 Formalizing the standardised ΔEVE computation

Following a discrete cash flow treatment (Banorte, Riesgos Financieros, 2025), for each prescribed shock scenario i and currency c, where i = 0 denotes the unshocked base case and i ∈ {1,...,6} denote, respectively, the parallel shock up, parallel shock down, steepener, flattener, short-rate shock up, and short-rate shock down scenarios prescribed by the Basel standardized framework, every future notional repricing cash flow is allocated to a repricing bucket, indexed k = 1, ..., K, according to the instrument's residual maturity for fixed rate positions (adjusted for behavioral models such as prepayment, where relevant) or its next repricing date for floating rate positions, producing a cash flow schedule $CF_{i,c}(k)$.

Each bucket is discounted using a continuously compounded factor built from the risk free curve of currency c, where t_k denotes that bucket's tenor in years, here computed from its residual calendar day count under the ACT/360 convention adopted for this paper's examples, and $z_{i,c}(t_k)$ is the annualized continuously compounded risk free zero rate for tenor t_k under scenario i, so that the discount factor for each bucket is:

$$DF_{i,c,k} = \exp\left[-z_{i,c}(t_k)\, t_k\right]$$

The present values of interest rate sensitive assets and liabilities are aggregated separately across all buckets:

$$PV^{A}_{i,c} = \sum_{k} C\,F^{A}_{i,c}(k) \cdot DF_{i,c,k} \qquad PV^{L}_{i,c} = \sum_{k} C\,F^{L}_{i,c}(k) \cdot DF_{i,c,k}$$

where $CF^{A}_{i,c}(k)$ and $CF^{L}_{i,c}(k)$ are the asset and liability cash flows in bucket k respectively, both introduced as positive values, and $PV^{A}_{i,c}$, $PV^{L}_{i,c}$ are their present values. The economic value of equity for scenario i and currency c is their difference:

$$EVE_{i,c} = PV^{A}_{i,c} - PV^{L}_{i,c}$$

The scenario specific change relative to the unshocked base case is $\Delta EVE_{i,c} = EVE_{0,c} - EVE_{i,c}$ for $i \in \{1, \ldots, 6\}$, and the overall EVE risk measure taken to the supervisory outlier test is the largest loss across all six prescribed scenarios, aggregated across currencies:

$$Loss^{EVE}_{i} = \sum_{c} x_c\, max\left(0, EVE_{0,c} - EVE_{i,c}\right)$$

$$EVE\text{ Risk} = \max_{i \in \{1,\ldots,6\}} Loss^{EVE}_{i}$$

where x_c denotes the FX conversion factor to the reporting currency;

A bank may equally slot cash flows into calendar date buckets and use ACT/365 or another accrual basis in place of the ACT/360 convention adopted here, provided the contractual maturity, the repricing or reset date, and the coupon payment date, which need not coincide, are kept distinct. Separately, the standardized approach's automatic option component is out of this document's scope: the Basel treatment (BCBS Basel Framework, SRP31.95-31.100 and SRP31.129) adds a separate automatic option value change to the discounted cash flow result before the currency aggregation step. Writing that adjustment as K^{AO}, the full per-currency loss is L^{EVE} = (EVE base − EVE shocked) + K^{AO}; this document sets K^{AO} to zero throughout, an explicit simplifying assumption for its worked examples rather than a claim that automatic option risk is immaterial in general.

The formalization of EVE makes explicit two features. First, discounting is exact rather than duration linearized, so convexity arising from fixed cash flows is captured directly through the exponential discount factor itself, applied to $CF_{i,c}(k)$, though the discretization into a finite number of buckets remains itself an approximation regardless of how exactly each bucket is discounted; where cash flows also change by scenario, as with prepayment optionality, a second, distinct source of non-linearity is added on top of the exponential discounting one, since the schedule being discounted is no longer the same across scenarios. Second, the risk measure is a maximum over six scenarios rather than a single parallel shock number, which is precisely why non-parallel shocks (steepener, flattener, short rate shocks), can bind even when a parallel shock duration gap looks well hedged.

3.3 The role of non-maturity deposits and prepayment optionality

Non-maturity deposits (NMDs) have no contractual maturity, so their EVE and NII treatment depend entirely on behavioral assumptions about core balance stability and pass through (deposit "beta"). A bank that assigns NMDs a long behavioral maturity is explicitly extending the duration in the EVE sensitivity calculation: the Basel Committee frames this explicitly as an irreducible trade-off (BCBS Basel Framework, SRP98.28, footnote 4).

Two conceptually distinct behavioral dimensions underlie this assumption and should not be conflated:

(i) Balance persistence, or decay, determines the expected time a deposit remains on the balance sheet and feeds the behavioral maturity used for EVE calculation.

(ii) Rate pass-through, or beta, governs when and how much of benchmark rate change is transmitted to the deposit rate and primarily affects the NII metric.

A deposit can be highly stable in volume yet reprice its rate quickly or be stable in both volume and rate; the behavioral maturity used for EVE and the beta used for NII should be mutually consistent, since both are estimated from the same underlying deposit behavior, but they are not the same parameter and need not move together. It also follows that assigning NMDs a longer behavioral maturity can reduce EVE risk only to the extent that it offsets an existing long duration asset exposure; under different balance sheet structures, the same lengthening could increase EVE exposure.

In practice, the behavioral segmentation of NMDs into a rate sensitive and a stable (core) component is bounded by prudential limits on both the proportion and the average tenor assigned to the non-sensitive portion, which vary by deposit segment. These caps are themselves prescribed by the BCBS standardized framework: Annex 2 of BCBS d368 sets the maximum core (non-sensitive) proportion and the maximum average repricing maturity for each deposit segment.

These caps matter for the EVE side of the trade-off in a specific way, not merely as a governance formality. Treating a larger share of NMDs as core, and assigning it a longer average tenor, lengthens the effective duration of that liability; whether this reduces net EVE sensitivity depends on the rest of the balance sheet, since it strengthens the liability's role as a natural hedge only to the extent that it offsets an existing long duration asset exposure, and a bank with a different asset profile could see the same lengthening increase, rather than reduce, its EVE exposure. Left unconstrained, a bank could therefore adjust its measured EVE

exposure, in either direction depending on its own balance sheet, simply by assuming a larger and longer-lived core deposit base, a modelling choice rather than a genuine change in the underlying balance sheet. The Basel ceilings in Table 2 limit this discretion: by capping both the proportion that can be classified as core and the tenor it can be assigned, the standardized framework forces a residual share of NMDs, from 10% for retail transactional deposits up to 50% for wholesale deposits, into the overnight bucket, where it contributes very little sensitivity of its own to a parallel shock given its short discounting horizon, regardless of a bank's own behavioral evidence.

This caps how far a bank's own behavioral modelling can extend the EVE slotting of NMDs balances; it is a limit on the modelling discretion, not by itself a guarantee of a positive minimum EVE loss at the balance sheet level, which continues to depend on the rest of the balance sheet's structure. This limit on slotting discretion does not, in any event, establish a symmetric restriction on NII sensitivity: whether that same residual share is also rate sensitive for NII purposes depends on the deposit beta assumed for it, a parameter estimated independently of the core/tenor classification, so a longer assumed tenor for EVE purposes need not mute the earnings impact of a shock on that balance. Nor does a positive NII sensitivity on this segment in isolation imply a positive net exposure at the balance sheet level, since offsetting assets or hedging derivatives may compensate it, on both the EVE and the NII side.

Category	Limit on non-sensitive proportion (%)	Limit on average tenor (years)
Retail — transactional	90	5
Retail — non-transactional	70	4.5
Wholesale	50	4

Table 2. Limits on non-rate sensitive deposit balances by category (Source: BCBS Basel Framework, SRP31.110

In the same context, a parallel and equally consequential set of behavioral parameters governs prepayment optionality on fixed rate lending. Prepayment intensity depends on the direction of the rate shock: borrowers refinance more readily when rates fall, since a lower prevailing rate makes early repayment economically attractive, and less readily when rates rise, since doing so would mean giving up a now below market fixed rate. The standardized framework captures this asymmetry through scenario specific multipliers γi, applied to the base prepayment rate used in constructing the cash flow schedule $CF_{i,c}(k)$.

Scenario	γi (scenario multiplier)
1 — Parallel shock up	0.8
2 — Parallel shock down	1.2
3 — Steepener	0.8
4 — Flattener	1.2
5 — Short rate shock up	0.8
6 — Short rate shock down	1.2

Table 3. Prepayment-rate multipliers by regulatory shock scenario (Source: BCBS Basel Framework, SRP31.119)

For EVE, faster prepayment in a falling rate scenario (γ = 1.2) returns principal to the bank sooner, at par; within the run-off view of EVE, this caps the economic value gain the bank would otherwise realize from continuing to hold an above market fixed rate asset, since the asset is effectively returned early rather than held to its remaining contractual maturity, and this loss of value from the option's exercise need not itself introduce any assumption about reinvestment, which belongs instead to a dynamic NII projection where maturing balances are in fact replaced.

In a rising rate scenario, the reverse holds: slower prepayment (γ = 0.8) keeps the bank holding a below market fixed rate asset closer to its full remaining contractual amortization than the base scenario's prepayment assumption implies, maximizing the EVE loss from that asset relative to the base case, though never beyond what a fully unadjusted, prepayment free schedule would already show. The fixed rate asset's effective duration therefore shortens in a rally and lengthens in a sell-off relative to the base scenario, a convexity effect that amplifies the EVE sensitivity captured by the cash-flow revaluation.

For NII, the same acceleration works through the reinvestment channel formalized in next Section: when γ > 1 (rates falling), principal returns earlier and must be redeployed into new lending at the now lower market rate, so the margin compression that a static, prepayment free schedule would place at the loan's original maturity is instead pulled forward into the earnings horizon, arriving sooner, and for a sufficiently long dated original loan, arriving within the horizon at all rather than falling just outside it. When γ < 1 (rates rising), the opposite delay applies relative to the base scenario's own prepayment assumption: the bank continues collecting a below market fixed rate for somewhat longer than the base case would have implied, deferring the point at which that balance can be redeployed at the new, more favorable rate, and so extending a drag on NII relative to the base scenario, though never beyond what a fully unadjusted, prepayment free schedule would already imply. Prepayment therefore does not merely reshape the EVE side cash flow profile; it directly redates the timing of income recognized within the ΔNII projection, which is why its scenario specific calibration is as consequential for the earnings side of the trade-off as it is for the economic value side.

3.4 Internal dynamic ΔNII methodology and the regulatory NII SOT

Internal earnings based IRRBB measures may be computed dynamically, incorporating projected business volumes, product mix and pricing. The regulatory NII SOT, by contrast, applies a one-year constant balance sheet assumption. Best practice, reflected in the EBA's 2022 guidelines and in the wider industry literature on NII at risk modelling, projects net interest income over a forward-looking horizon, typically twelve months, under both the current (base) yield curve and each of the prescribed shock scenarios established by Basel or a particular regulatory requirement, and compares the resulting projections.

In a dynamic ΔNII projection:

1) The balance sheet is not held constant: assumed new business, including origination volumes, product mix, and pricing, is projected forward under each scenario, so that maturing and prepaying balances are replaced;

2) Repricing behavior is modelled, so in this fashion floating rate assets and liabilities reprice according to their contractual reset, but administered and non-maturity rates reprice according to an estimated pass through, or deposit beta, which is itself typically assumed to vary by scenario and by deposit segment, a rate increase, for instance, usually passes through faster and more fully to wholesale deposits than to retail transactional balances;

3) Maturing and prepaying balances are reinvested or refinanced at the prevailing scenario consistent market rate rather than left unaccounted for beyond the horizon, so the projection captures the compounding effect of a sustained rate shock on rolled over positions within the horizon; and

4) Commercial margins over the relevant benchmark are ordinarily held constant across scenarios, the shock is applied to the benchmark curve, not to the spread the bank charges over it, unless the scenario design specifically calls for margin compression or competitive repricing pressure to be modelled as well.

The scenario-specific NII loss is projected NII under the base case minus projected NII under scenario i, aggregated over the earnings horizon and, as with ΔEVE, translated into the reporting currency and aggregated according to the applicable supervisory offset rules for the supervisory outlier test; these rules may restrict or haircut the recognition of gains in one currency against losses in another, so the risk measure formulation of this Section, which sums only positive loss contributions without cross currency offset, should be read as a conservative internal variant absent such compensation, exactly as for ΔEVE.

Thus,

Divide the earnings horizon H (typically twelve months) into sub-periods τ = 1, ..., T, each with year fraction α_τ. Let $R^{ref}_{i,c,\tau}$ denote the benchmark reference rate path under scenario i and currency c (the base curve when i = 0, the shocked curve otherwise) and $\Delta R^{ref}_{i,c,\tau} = R^{ref}_{i,c,\tau} - R^{ref}_{0,c,\tau}$ the deviation from base.

Let $\bar{V}^{A}_{j,i,c,\tau}$ and $\bar{V}^{L}_{g,i,c,\tau}$ denote the average, rather than point in time, asset and liability balances outstanding in sub period τ under scenario i, themselves a function of the contractual repricing and behavioral assumptions, together with any assumed new business volume. Projected net interest income is then a single sum over sub-periods, an asset and a liability term, and an explicit derivative term:

$$NII_{i,c} = \sum_{\tau=1}^{T} \alpha_\tau \left[\sum_j \bar{V}^A_{j,i,c,\tau}\ r^A_{j,i,c,\tau} - \sum_g \bar{V}^L_{g,i,c,\tau}\ r^L_{g,i,c,\tau} \right] + I^{deriv}_{i,c}$$

The applicable rate r depends on the instrument type rather than on a single rule: a fixed rate instrument, asset or liability, already originated, earns or pays its contractual coupon regardless of scenario i for as long as it remains within its current fixed period; a contractually floating instrument reprices at the fixing applicable to its own index and reset date under scenario i, plus its contractual margin; and for administered rate and non-maturity liabilities only, r follows the pass through relation $r^L_{g,i,c,\tau} = r^L_{g,0,c,\tau} + \beta_{g,i,c}\Delta R^{ref}_{i,c,\tau}$, with β estimated rather than contractual. $I^{deriv}_{i,c}$ captures net cash flows from derivative instruments entered for hedging purposes, that are included in the bank's definition of NII, specifically the interest accrued on the derivative under the applicable accounting basis; fair value changes on the same instrument are a separate accounting outcome that hedge accounting elections may or may not route through NII, and choosing an accounting treatment does not by itself convert one into the other.

The scenario specific change relative to the unshocked base case is $\Delta NII^{loss}_{i,c} = NII_{0,c} - NII_{i,c}$ for $i \in \{1,2\}$, the EBA's prescribed parallel up and parallel down scenarios and mirroring the EVE risk measure, the ΔNII risk measure is the largest loss across both scenarios, aggregated across currencies:

$$Loss^{NII}_i = \sum_c x_c\, max\big(0, NII_{0,c} - NII_{i,c}\big)$$

$$\Delta NII \text{ Risk} = \max_{i\in\{1,2\}} Loss^{NII}_i$$

Because $\Delta NII_{i,c}$ depends on projected balances $V^A_{j,i,c,\tau}$, $V^L_{g,i,c,\tau}$, themselves functions of assumed new business volumes, and on deposit betas $\beta_{g,i,c}$ estimated from historical pass-through behavior rather than read off a contract, a full dynamic ΔNII projection is materially more demanding to build and validate than a static repricing gap view.

It is important, however, to distinguish this internal dynamic ΔNII methodology from the regulatory NII supervisory outlier test (NII SOT). Under the EU supervisory outlier test, the EBA specifies a constant balance sheet assumption over a one-year horizon, under which maturing and prepaying positions are replaced according to prescribed regulatory replacement conventions, not the bank's own projected new business, product mix, or commercial strategy; this is not equivalent to a dynamic commercial projection of growth and mix.

As a matter of internal ALCO practice, by contrast, the dynamic methodology set out above is designed for internal management and stress testing and permits growth, production, pricing, and commercial mix assumptions to vary by scenario. The two coexist rather than substitute for one another: an ALCO typically runs the internal dynamic model for its own risk appetite and business planning, while the regulatory NII SOT, computed under the constant balance sheet and regulatory replacement assumptions, is reported for supervisory purposes.

4. Intuitive worked examples

4.1 A stylized cash-flow illustration of compatible sensitivity changes

To illustrate how compatible improvements and residual risk work through both measures in practice, this Section works a single, deliberately small hypothetical balance sheet through both measures, with every assumption disclosed so the arithmetic can be reproduced independently.

Consider a MXN denominated bank whose exposure is summarized by three repricing buckets: a short dated bucket at day 30 comprising MXN 800 million of administered rate wholesale deposits and no offsetting repricing assets, so the net repricing gap (assets minus liabilities) is −800 million pesos; a medium dated bucket at day 360 with a gap of +300 million pesos; and a long dated bucket at day 1,800 (five years) with a gap of +1,200 million pesos, reflecting a book of long dated fixed rate assets; these net figures represent aggregated repricing cash flows rather than principal alone, so no separate coupon needs adding to them.

The base yield curve is taken as a flat 8% and the illustrative parallel up shock as a flat 9% (a 100 bp shock). Curves are continuously compounded, so the discount factor for a cash flow at day k under rate r is DF(k) = exp(−r·k/360).

The resulting discount factors are: day 30, DF = 0.9934 at the base rate and 0.9925 under the shock; day 360, DF = 0.9231 base and 0.9139 shocked; day 1,800, DF = 0.6703 base and 0.6376 shocked. The EVE risk measure is a maximum over all six prescribed scenarios; this illustration works through the parallel up shock alone.

Applying the ΔEVE formalization across all three buckets, the five year bucket falls well outside the 360 day earnings horizon but is fully within EVE's scope, since EVE discounts cash flows to their actual maturity, gives a base scenario present value of 286.6 million pesos and a shocked present value of 245.3 million pesos, for a ΔEVE of +41.3 million pesos: a loss under the sign convention, driven overwhelmingly by the five year bucket, whose present value alone falls by nearly 39 million pesos under the shock.

Applying the internal dynamic ΔNII formalization to the same balance sheet, only the day 30 bucket reprices within the twelve-month earnings horizon, the day 360 bucket matures at the very edge of the horizon, leaving no remaining exposure window within it, and the five year bucket does not reprice within the horizon at all. Because the day 30 bucket comprises L_{30} = 800 of administered rate wholesale deposits with no offsetting repricing assets (A_{30} = 0), the decomposition $\Delta NII \approx L\beta^{L}\Delta r - A\beta^{A}\Delta r$ reduces to the liability term alone.

Treating this funding position with an estimated deposit beta of $\beta_{c,\text{wholesale}}(i) = 0.75$, that is, a benchmark rate move passes through to only three quarters of the position's cost and assuming, as an internal ALCO convention rather than a description of the regulatory NII SOT, that the balance is rolled over at the same size once it reprices, so the remaining 330 days of the horizon are exposed at the new, partially passed through rate, gives, under the loss positive convention, $\Delta NII_{c}^{loss} \approx L_{30} \cdot \beta_{c,\text{wholesale}} \cdot \Delta r \cdot \frac{330}{360} = 800 \times 0.75 \times 0.01 \times 0.917 \approx 5.5 \text{ million pesos}$, a modest earnings loss driven entirely by the short dated funding gap, smaller than a full, unmodelled pass through would imply precisely because part of the benchmark move

is absorbed rather than transmitted to the net position; the long dated asset book still generates its own baseline NII, but contributes nothing to the change in NII within the twelve month horizon under the assumptions used here, since it does not reprice within that window. This NII calculation applies the 100 bp shock to simple interest accrual, whereas the EVE side above discounts against a continuously compounded curve; the two are adopted here as separate, explicitly stated conventions appropriate to each measure, not as an exact identity between them.

Now suppose the ALCO hedges this earnings exposure directly, entering a pay-fixed, receive-floating interest rate swap, represented in what follows as a stylized net repricing cash flow proxy rather than a fully specified contract, sized to the beta adjusted notional, $\beta_{c,\text{wholesale}}(i) \times 800 = 600 \text{ million pesos}$, effective from day 30 to day 360, an approximately eleven month tenor beginning at the day 30 reset, rather than a 30 day instrument, since a swap maturing in 30 days cannot simultaneously cover the remaining 330 days of the earnings horizon. The receive floating leg is assumed to reprice alongside the underlying funding at day 30, a hypothesis imposed on the proxy, offsetting the beta adjusted exposure and neutralizing the NII impact under that assumption; the pay-fixed leg, however, is a fixed cash flow due at the swap's maturity, day 360, and therefore carries duration that the standardized cash flow treatment of EVE assigns to that bucket.

For transparency, the swap is represented throughout this Section as a simplified, stylized net repricing cash flow proxy, which is sufficient for illustrating the direction and rough size of the EVE effect, but it is not a reproducible contractual valuation; a rigorous treatment would instead model a forward starting FRA or a swap with an explicit coupon calendar and forward rates consistent with the curve. Decomposing the swap into its two legs for EVE purposes: the receive-floating leg contributes an asset like cash flow of +600 million pesos to the day 30 bucket, changing its net gap from −800 to −200 million pesos; the pay-fixed leg contributes a liability like cash flow of 600 million pesos due at day 360, changing that bucket's net gap from +300 to −300 million pesos. Recomputing ΔEVE across all three buckets with these revised gaps, $\Delta EVE_{hedged} \approx (-200) \cdot 0.0009 + (-300) \cdot 0.0092 + (1200) \cdot 0.0327 \approx 36.3 \text{ million pesos}$, down from +41.3 million pesos before hedging, a reduction of roughly 5 million pesos, materially smaller than the loss driven by the unhedged five-year asset book. The bank has therefore closed its NII exposure to this shock under the proxy's imposed assumptions while modestly reducing, rather than worsening, its EVE exposure, which nonetheless remains dominated by the five-year asset book. This compact, arithmetically reproducible stylized example illustrates the fact that a hedge closing the repricing gap does not generally close the duration mismatch, and the residual effect on the other measure must be demonstrated.

4.2 A genuine local conflict: the equity investment term

The Basel Committee's own conceptual example of investing surplus capital short versus long appears in the Basel Framework's application guidance (SRP98.28, footnote 4); the MXN figures, the specific tenors, the weight w, and Table 4 below are this document's own numerical adaptation.

The example uses equity capital not backed by any interest-bearing liability, specifically to keep the balance sheet side of the choice out of scope; a non-interest-bearing deposit, by contrast, remains a liability that can carry its own behavioral EVE sensitivity and would require modelling that side of the balance sheet as well, so it is not used here. Unlike the previous example, where compatible

improvements were found, this choice exhibits a genuine trade-off within the restricted set of allocations considered, because it is a single allocation decision between two instruments rather than two independently addressable exposures.

Consider a stylized bank that receives an equity contribution of MXN 500 million in cash and allocates the proceeds between two zero-coupon instruments: a short instrument purchased for 500 (1 − w) million pesos and maturing at day 30, repricing at that date rather than immediately, and a long instrument purchased for 500w million pesos and maturing at day 1,800 (five years); with a positive yield, both instruments are acquired at a discount to their face value, not at par.

Both positions are acquired before the same shock as in the previous example; at market prices under the base curve, and are then revalued under the stressed curves, w is therefore a fraction of the initial 500 million budget, not of a future notional, so both allocations are funded from the same starting investment. Evaluating under both the parallel up and parallel down scenarios prescribed for the EVE risk measure and the NII SOT, with the down scenario set explicitly at a flat 7% against the 8% base curve, and restricting S_E = S_N = {+100 bp, −100 bp} for this illustrative exercise rather than identifying it with the full six scenario regulatory EVE measure, the worst case EVE loss, realized under the parallel up shock, is driven by each instrument's own purchase price and maturity, and is exact within this stylized model:

$$R_E(w) = 500(1-w)\left(1 - e^{-0.01/12}\right) + 500w(1 - e^{-0.05})$$

while the worst case NII loss, realized under the parallel down scenario, is driven entirely by the short instrument. To keep this approximate to the same simple accrual convention, rather than reconstructing a fully continuous compounding reinvestment, only the originally invested 500(1 − w) is treated as rolling over at day 30, as an internal ALCO convention, at the new rate for the remaining 330 days of the horizon; the first month's own accrued return, identical under either scenario, is treated as distributed or otherwise held outside the remunerated balance rather than added to the rollover amount, and the 100 bp shock is applied to a simple accrual rate as an NII specific approximation, separate from the continuously compounded curve used for $R_E(w)$ above. The long instrument's income accrues at its original, locked in yield throughout the horizon and so contributes nothing to the change in NII. Under this convention, an approximation of the worst-case NII loss is:

$$R_N(w) \approx (1-w) \cdot 500 \cdot 0.01 \cdot \frac{330}{360}$$

Table 4 evaluates this frontier at three points, computed at full precision and rounded only in the final results shown.

Allocation to the 5-year bond (w)	$R_E(w)$: worst-case EVE loss (MXN million)	$R_N(w)$: worst-case NII loss (MXN million)
0% (all short, day 30)	0.42	4.58
50% / 50%	12.40	2.29
100% (all long, day 1,800)	24.39	0.00

Table 4. Illustrative EVE/NII frontier for the equity investment term choice

The NII column depends on the reinvestment convention adopted: a fully continuous compounding reinvestment of the instrument's own maturity proceeds, or a simple accrual reinvestment of the full proceeds rather than only the original principal, would each give somewhat different figures for $R_N(w)$. In every such variant considered, however, $R_N(w)$ remains decreasing in w while $R_E(w)$ remains increasing in it, so the qualitative frontier result below is not sensitive to this choice. Differentiating both expressions confirms the pattern that the table shows:

$$R'_E(w) > 0 \quad \text{and} \quad R'_N(w) < 0 \quad \text{for all } w \in [0,1]$$

increasing the long-term weight raises the worst-case EVE loss and lowers the worst-case NII loss for every w in the allocation set $\mathcal{H}$ = {w : 0 ≤ w ≤ 1}.

Every allocation is therefore Pareto efficient within this restricted set; the example makes no claim about efficiency once additional hedging instruments, such as swaps, options, or a change in funding, are admitted to the feasible set, and does not establish that no allocation achieves a low loss on both measures simultaneously, only that within this two instrument set, improving one measure's worst case requires worsening the other's. This is the mechanism the Basel Committee's own conceptual example, and this document's central topic describe: within the allocation choice considered, a bank cannot simultaneously minimize both measures. The contrast with the past example is instructive: there, compatible improvements were found because the funding gap and the asset duration mismatch are two separate exposures that a single instrument can, under those assumptions, address jointly; here, the investment term is one decision that mechanically serves both measures in opposite directions.

5. Drivers of the Trade-off

Drawing on the mechanisms described above and on IRRBB practice, five variables principally determine how binding the EVE/NII trade-off is for a given institution:

- Currency and yield curve mix. Institutions with cash flows spread across multiple currencies inherit multiple yield curve shapes and multiple prescribed shock magnitudes.

- Behavioral assumptions on NMDs and prepayments. The choice of core balance and prepayment assumptions is often among the most important drivers of both EVE and NII sensitivity, and a primary lever through which the trade-off can be reshaped by the ALM function; whether reshaping can go as far as eliminating a given institution's conflict, rather than only reducing it, depends on the feasible hedges and balance sheet actions available to that institution, conditional on independently estimated and validated behavioral parameters.
- Discounting and repricing gap structure. The specific shape of the repricing gap by tenor, rather than only its aggregate duration, determines how sensitive NII is to non-parallel shocks (steepeners, flatteners, short rate only shocks); an aggregate duration neutral position can still carry substantial short rate NII exposure if its gap structure is concentrated at particular tenors.
- Hedging instrument selection. Interest rate swaps are the primary hedging instrument in practice, but their tenor structure, notional profile, and whether they are structured as a single bullet swap or a laddered strip determine whether the hedge closes the duration gap (favoring EVE), the near-term repricing gap (favoring NII), or both simultaneously when the underlying balance sheet permits it.
- Pricing and margin management. Deposit rate floors can limit reductions in funding costs when market rates fall, whereas floors on adjustable rate mortgage coupons can limit declines in asset yields under the same scenario; their net effect on NII therefore depends on the relative exposures, reset dates and binding thresholds on each side of the balance sheet, rather than having a universal sign, and should be evaluated jointly with the EVE hedge, distinct from any floor or cap on prepayment probabilities, meaning pricing policy is not separable from the ALM hedging decision.

6. Toward an Optimal Balance

The trade-off should be formalized, not merely observed.

An ALCO can specify explicit constraints: a maximum tolerable ΔEVE as a percentage of Tier 1 capital and a maximum tolerable ΔNII as a percentage of budgeted net interest income. Because the internal NII limit and the regulatory threshold of Tier 1 capital use different denominators, the percentages should not be compared directly. Both should first be translated into monetary amounts. The hedge portfolio can then be selected jointly rather than by optimizing EVE and NII sequentially. Let h denote a set of admissible hedging actions and C(h) their cost or combined risk:

$$min \;\; C(h), \quad h \in \mathcal{H}$$

subject to

$$R_E(h) \leq L_{EVE}, \qquad R_N(h) \leq L_{NII}$$

The feasible set $\mathcal{H}$ incorporates the bank's practical constraints, including permitted instruments, notional and DV01 limits, counterparty capacity, liquidity and market access. If no feasible hedge satisfies both limits, ALCO must expand the permitted hedge set, revise the underlying balance-sheet structure or explicitly accept a controlled breach of one internal constraint. In simple cases, where hedge costs and sensitivities are approximately linear in notional, the problem can be solved using linear programming. More complex portfolios may require non-linear or scenario-based optimization, particularly when optionality, behavioral assumptions or transaction costs depend on hedge size.

In practice, ALCO combines natural and synthetic hedges (Banorte, Riesgos Financieros, 2025). Natural hedges arise from the balance sheet itself, for example when stable funding offsets the duration of a fixed-rate asset portfolio. Synthetic hedges, primarily interest-rate or cross-currency swaps, address the remaining duration, repricing or currency gaps.

The effectiveness depends on how closely the hedge matches the underlying exposure in index, tenor, reset date and notional; any mismatch remains as basis risk.

7. Applications and Use

The framework developed is directly applicable to ALM functions when EVE only or NII only measurement remains more common than joint EVE/NII management. Three applications follow directly:

- ALCO reporting: presenting ΔEVE and ΔNII jointly under a common scenario map, the six prescribed BCBS scenarios for EVE and, at minimum, the parallel up and parallel down scenarios prescribed for NII, supplemented by internal non-parallel NII scenarios with an explicit indication of magnitude of co-movement between the two measures across scenarios.
- Hedge design: using a formal and systematic approach for hedge structures.
- Behavioral model governance: treating the calibration of NMDs core balance models and prepayment models as a joint EVE/NII governance exercise.

8. Conclusions and recommendations

Differences in horizon, discounting and behavioral assumptions make the EVE/NII trade-off a reality; this document has argued that it is not merely a supervisory artefact, though establishing its existence and severity for a given institution requires demonstrating a downward sloping frontier, for that institution's own balance sheet and feasible hedges, not merely observing that EVE and NII are constructed differently. The Basel Committee's own illustrative example, shows that a bank may not be able to stabilize economic value and earnings simultaneously with a single allocation decision; this example captures the mechanism, though not its universality: a bank cannot generally assume that stabilizing one perspective will stabilize the other, and whether both can be materially reduced simultaneously is an empirical question determined by balance sheet structure, behavioral assumptions, and the available hedging set.

The practical conclusion for ALM practitioners is that the trade-off should be formalized as an explicit joint constraint in hedging design. Neither a purely EVE driven nor a purely NII driven hedging mandate is generically correct, since hedging one dimension in isolation can destabilize the other, and the behavioral treatment of NMDs, deposit repricing and prepayment should be recognized as a principal governance lever connecting the two dimensions.

Three recommendations for banks follow from this analysis; they reflect the author's own views rather than any supervisory requirement.

1. Set EVE and NII limits as a single, jointly calibrated risk appetite. Both limits should be expressed in monetary terms, approved together by ALCO and the board, and every hedge proposal should report its impact on both measures across the full scenario set before execution, rather than being approved against one limit and checked against the other afterwards.

2. Govern behavioral assumptions as one model with two outputs. NMDs balance decay, deposit betas and prepayment rates should be estimated from a common data set, validated independently and backtested, and any recalibration should be approved only after its joint effect on ΔEVE and ΔNII has been shown, so that a parameter change cannot quietly improve one metric while worsening the other.

3. Monitor the divergence itself as an early warning indicator. The ALCO pack should include a standing view of how ΔEVE and ΔNII move relative to each other across scenarios, and a persistent widening between the two, of the kind observed at SVB, where earnings held up while economic value eroded, should trigger escalation and a review of the hedging strategy rather than be treated as a reconciling item.

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