INTEREST RATE RISK IN THE BANKING BOOK (IRRBB)
FREQUENTLY ASKED QUESTIONS

This publication has been prepared by the European Banking Federation in response to the questions frequently raised during outreach meetings on the treatment of the interest rate risk in the Banking Book. This publication can be found online on the EBF website and is subject to regular updates.

For the EBF position paper on Interest Rate Risk in the Banking Book, please consult the following link:


Question 1

Do financial institutions run open asset-liability mismatches that can be the source of value depletion in a rising rate environment?

Banks play significant roles in the real economy facilitating effective capital flows and stable liquidity supply, supporting macroeconomic needs for savings and investments. To fulfil this role bank’s tasks include taking deposits from customers and engage in customer lending. By doing so they engage in a transformation between borrowing and lending interests.

Characteristics from both the assets (loan business) and liabilities (e.g. deposits) differ. Therefore the Asset Liability Management (ALM) functions within banks are managing resulting positions and any hedging or financing requirements. Both assets as well as liabilities may contain behavioural elements that need to be considered to properly reflect their liquidity and interest rate risk pattern. Behavioural modelling is applied to mirror liabilities and assets economic profiles. In particular, non-maturing deposits and equity form a significant part of a typical bank’s source of funding. The role of each of these funding types is discussed below, along with other considerations.

1. Non-Maturing Deposits

A significant amount of bank funding is in the form of non-maturing deposits (NMDs). As mentioned in Instructions for Basel III monitoring, NMDs can generally be defined as ‘deposits that the depositors are contractually free to withdraw at any time’. This is a significant component of the Banking Book liability base as most retail deposits are NMDs.

Although it is theoretically possible for NMDs to be withdrawn at demand, historical experience has shown that this is a stable form of funding with an average life that is longer than overnight, justifying a longer-term investment horizon. Applying models to properly reflect the correct duration of deposits with undefined maturity profiles is also known as maturity transformation. Bank’s ALM team measure deposit’s estimated liquidity stability as well as their interest rate risk sensitivity which depends on their correlation to market rates. Those characteristics are usually specific for product and client areas. As a result the ‘estimated profile based on analysis and modelling will be used in ALM functions to finally neutralise bank’s positions.

2. Equity
Equity is at the same time:

- A non-interest bearing funding source;
- A regulatory requirement to absorb losses when they occur;
- The residual claim that shareholders (or members in the case of co-operative banks) have on the proceeds from the assets after all the more senior liabilities are paid.

Under a going concern perspective, equity is a stable non-interest bearing resource which can create interest rate risk, if it is assumed to be invested in interest bearing assets. However, from an earnings point of view, there cannot be an interest rate loss from investing equity in fixed rate assets in order to stabilize earning flows. At worst, there could be an opportunity loss, but always with positive Net Interest Income (NII) from equity investment (if invested at positive interest rates).

From a shareholders point of view, the respective share price in the above mentioned case will of course change given that for the equity investor opportunity costs exist and any value change in assets would directly translate into the respective value of equity. Shareholders’ views with respect to the earnings expectation vary and banks apply different business strategies where some are focussing on delivering stable earnings whereas other banks’ aim at delivering procyclical earnings for shareholders.

3. Economic Value versus Earnings Consideration

We believe that the concern of regulators about value depletion in a rising rate environment is based on an economic value perspective. From that perspective a bank will see a loss of value due to rising rates as the economic value of long-term investments of NMD and equity investments will be affected negatively in such an environment. However, this fails to recognise the following:

1) The potential NII offset from margin management of interest bearing products and the benefit from re-investment of the structural NMD and equity volumes as in practice, banks adopt a “rolling” approach or caterpillar structure to the investment of NMDs, while a number of banks do the same for equity.

2) The reflection of the inherent risk within bank’s deposit base. Maturity transformation, i.e. the longer-term investment of NMD’s is an instrument to stabilise margins, as it is a reflection of the modelled risk position: effectively it hedges the deposit’s risk.

3) In an overall risk view no material mark-to-market risk would occur in either a rising or declining rate scenario as modelled risks on NMD’s and equity offset risk on fixed rate investments and credits. Of course, remaining risk from model uncertainties persists.

4) The economic value decline will only show up in corresponding investments which can have a negative impact on equity only, if they are accounted for at fair value through profit and loss (or Available for Sale).

5) The stabilization in interest income is achieved generally by natural offsetting hedges (no additional market trade which can fluctuate through profit and loss; only the portion not covered by natural hedges would bear this economic value risk in equity if no hedge accounting solution is possible).

4. Risk Governance

It is common practice within financial institutions to manage the Banking Book and to define risk limits in terms of permissible interest rate mismatch within a neutral zone that is commensurate with the board risk appetite. Examples of metrics used include absolute or relative interest rate gap limits per tenor bucket and NII sensitivity limits but also VaR limits and market interest rate sensitivities are used. These limits restrict the ability to take positions within the Banking Book.
whilst allowing firms to strike a compromise between net interest income sensitivity and economic value sensitivity that cannot be simultaneously cancelled out.

Summary

Bank’s ALM departments perform comprehensive measurement and management of balance sheet positions to effectively steer liquidity and interest rate risk. Oversight is done by independent risk and control functions. Applying extensive analysis to align bank’s positions arising from their usual business includes the aggregation of contractual positions as well as the behavioural modelling where contractual information are not sufficient.

The above descriptions aim to briefly outline examples where and how banks manage their risks on a daily basis. A proper governance and control around this function is key to manage this according to a bank’s senior management risk appetite and subject to regulatory requirements.

Question 2

What is meant by Economic Value and why does the industry view differ to that of the Task Force on the Interest Rate Risk of the Basel Committee for Banking Supervision (TFIR)?

The economic value (EV) has never been formally defined neither by the industry nor by the Basel Committee. There are several possible ways to define EV:

1. The simplest approach is to compute the Net Present Value (NPV) of all existing principal fixed cash flows using a “risk free” curve, and then to re-compute using an appropriately “shocked” curve. The difference in NPV then constitutes the EV sensitivity to a given rate shock. This is the approach that is often referred to as a static cash flow gap approach as the re-pricing or maturity dates of products are assumed to be the same regardless of the interest rate shock.

2. One variation to this approach is to include fixed interest cash flows (besides the principal cash flows). This appears to be the approach envisaged by the TFIR based on the first QIS template.

3. A more significant variation is a dynamic gap approach whereby re-pricing dates and maturity dates are themselves modelled as being a function of the interest rate shock; to an extent, this can help capture margin compression, pre-payment risk etc.

4. Others consider EV as a measure of the market or fair value of the book, but, because there is no market for some Banking Book products - and therefore no market price - the term “economic value” is used instead. In this approach, the value of such non-traded products is computed as the NPV of all their cash flows using, for each product category, a separate risk adjusted discount curve. Clearly this is an advantage over the above approaches, as the base EV is likely to be a far truer representation of the value of the book, but whether, for the purposes solely of computing a sensitivity to a change in the level of general interest rates, this approach has any real advantage is not clear.

5. Another view is that EV is the present value of all projected future NII – i.e. taking into account future business and the bank’s ability to re-margin. This seems to be fundamentally an income approach, modified solely to give a view as to the true likely value of the bank in the event of its sale or liquidation.
Our understanding is that the TFIR, in its use of the term EV, is not considering approaches 3, 4 or 5.

**Pros and cons with EV as per approaches 1 and 2**

**Pros**
- Works for positions where the intention is to close in the short term with a market instrument i.e. approximates the risk of cost of closure increasing
- Gives a good operational indication where open contractual mismatches might sit
- Easy to implement (less guidance needed from regulators)

**Cons**
- Does not work for items where the value does not get impacted by the full amount of the external shock or at a different time point to that assumed in the gap
- Will entirely miss risks relating to margin compression and basis risk
- Assumes business will simply run off past last fixed date
- Only “early warning indicator” - projected changes in value will not immediately hit P&L and ignores other items too, so a very poor indicator of risk to solvency

As regards the term economic value of equity (EVE), we believe the TFIR thinks of this the same as EV (definitions 1 or 2) but with equity either excluded (or shown as an overnight liability – the effect on the calculation of EV sensitivity is identical).

Simple static principal and interest cash flow gap economic value based approaches (as per the approach taken in the QIS) have some merit in terms of identifying open mismatches in the Banking Book and certainly constitute a valuable internal control. They are, however, generally poor at quantifying the real risk to a Banking book, as opposed to a Trading Book. Present value analysis does not show periodic effects on P&L. Only the cash flows from existing transactions (and their contractual-equivalent) are considered in static principal and interest cash flow gap economic value-based metrics.

Moreover, the time band mapping of cash flows in a principal and interest cash flow gap economic value based approach inherently assumes that the full amount of all cash flows (regardless of underlying product type) within a specific time bucket will be re-evaluated instantaneously and permanently by the overall shock being modelled, and that this will happen regardless of the direction of the shock. So changes in the size and composition of the balance sheet as well as product features and changes in client behaviour are not taken into account in that approach, the present value impact just shows the long term opportunity impact at a point in time, not reflecting the term structure.

We believe that the TFIR is attempting to interpret EV as a measure of bank solvency by applying a Trading Book type approach of viewing the EV of the Banking Book as the fair or liquidation value of the balance sheet. The value of a Banking Book in a liquidation or bail out scenario is extremely unlikely to equal the assumed NPV of its fixed cash flows, and certainly not the NPV of its existing (pre-failure) fixed cash flows. The purpose of EV is to provide an estimate of the value of the static balance sheet i.e. it is a proxy for long-term static balance sheet earnings ignoring accounting convention and the timing of income statement recognition. Therefore EV and its sensitivity are useful to banks’ and regulators but it is not directly related to a capital loss.

Given that the earnings/NII approach and the EV approach to interest rate risk can give opposite signals regarding the sensitivity to interest rate changes, the banking industry is advocating the appliance of both, the earnings/NII (e.g. for equity) and the EV approach.
Question 3

What is meant by behavioural risk? Is it possible to hedge this?

The nature of IRRBB is to a large extent a combination of behaviours and conventions. Behaviours and business developments are not only based on efficient-financial-market-rationality. Behaviours can be driven by many other factors, including, for example, social and demographic circumstances. Those behaviours affect loans and deposits’ balances (prepayment, rollover, product switching) and customer rates.

IRRBB is therefore dependent on those behaviours. Models are developed and maintained on the basis of a combination of historical data analyses and customer behaviour assumptions as not everything can be derived from historical experience. In order to manage the IRRBB, the modelled interest rate risk exposure must be translated into theoretical marketable financial instruments that are similar to those of the trading environment.

Behavioural risk refers to the possibility of reduced P&L or losses due to customer behaviour being uncertain and different to that which is expected/modelled. The ability to fully immunise a bank against variance is not possible due to the behavioural nature of Banking Book items. As such, the role of ALM in conjunction with business units is to identify and actively monitor customer behaviour on a periodic basis to minimise any variance in realised vs expected customer behaviours.

Where the term of a product is uncertain due to the ability of the customer to exercise choice in the date they withdraw deposits or repay loans, there is no contractual re-pricing profile on which to base the identification and quantification of the risk.

For NMDs with uncertain maturity, the aim should be to establish the “stable” behaviourised balance under business as usual conditions and to derive the investment term horizon. This can be done using a variety of methods, ranging from a judgement-based analysis to the use of more sophisticated forecasting models with a variety of inputs. The stable balance forecast which is ultimately derived should be based on an analysis of long term stability and an expectation of how the NDM volume will be priced in the future. This will depend on an analysis of alternative investment products, the current and forward-looking interest rate environment, and the behaviour of these balances under various interest rate scenarios.

These expectations of the balance term will drive the investment tenor of these balances.

On the asset side products with uncertain maturity include for example variable rate mortgages where assumptions have to be established to determine the behavioural life. Even though the contractual reprice date for a variable rate asset is short term, banks will use a combination of methods to establish what the expected life is of the product similar to the approaches described above.

Fixed rate mortgages on the other hand have a contractual maturity date, however, banks will establish an expected behavioural tenor for these products, and e.g. a fixed rate mortgage with a contractual term of 5 years might have a behavioural life of 4 years. As rates rise or fall the asset profile lengthen and shorten e.g. meaning that the fixed rate mortgage balance stay for 5 years in an upward shock and
that customers repay early at the end of year 3 in a downward shock. This optionality risk can be hedged using swaptions.

**Question 4**

_Could the new proposals reduce bank’s incentives to provide fixed-rate products?_

The mini QIS required banks to enter into the re-pricing gap not just the principal amounts of loans, deposits and derivatives, but also all interest flows which were fixed as at the date of submission. Typically banks will hedge all fixed rate products, either with derivatives or offsetting customer positions, with the result that the net fixed interest rate position will effectively equal the margin on the fixed rate product, and generally this will be positive for both asset products (loans) and liability products (deposits). Applying this rule, therefore, will almost invariably create a net asset position on the gap report for those banks that offer fixed rate products, and any EV or EVE methodology will suggest that the bank is at risk to rates rising.

Obviously, by the same token, the bank would appear to gain in the event of a rate fall, but this, we feel, is not directly relevant as the capital charge will be most likely be based on a "worst" outcome. Bank’s product management and product offering could respond to this treatment of particularly fixed rate products. As a result, we feel that a potential consequence would be a reduction in the supply of fixed rate products to customers or, alternatively, banks entering into offsetting liability positions which would, cosmetically, reduce the capital charge, but would, in reality, create an open risk.

This could lead to undesired consequences as incentives are not correctly set and risk would not be properly reflected.