



## MACRO HEDGING OF INTEREST RATE RISK

---

### INTRODUCTION

Macro hedging is hedging undertaken on a portfolio basis. The usual rules for hedge accounting apply:

- Documentation of hedging strategy,
- Designation of the hedged items and the hedging instruments,
- Regular identification of ineffectiveness, and
- Ineffectiveness being taken to P&L immediately.

Documentation and designation of this hedging activity is done widely according to best bank practice as well as the requirements of the 'Principles for the Management and Supervision of Interest Rate Risk' (Basel Committee - January 2001). This requires risk management policies, procedures and information systems, risk measurement, monitoring and control functions, established and enforced operating limits and independent internal controls to be appropriate, taking into account the nature of the business and the complexity of risks. These requirements will satisfy the hedge accounting criterion for documentation and designation.

### I. MACRO HEDGING A PORTFOLIO

#### I.A The portfolio to be hedged

Macro hedging is the hedging of a portfolio of assets and liabilities for the same type of risk. This differs from hedging a single instrument or a number of the same type of assets (or liabilities) as there is risk offsetting between the assets and liabilities within the portfolio.

This form of hedging occurs not at a theoretical 'consolidated Group' level, but at an operational level, where individual assets and liabilities in the portfolio can be clearly identified. Within one banking group, several macro hedge portfolios for different activities may be separately managed at an operational level.

Macro Hedging does not require all assets and liabilities to be included in the portfolio. Only those that are designated for hedging form part of the hedged portfolio. IAS 39 does not include any requirements as to the degree of hedging a company has to undertake – this is up for management to decide.

However, once assets and/or liabilities are assigned to a macro hedge portfolio certain limitations arise:

- 1) They cannot be redesignated as speculative as this would contravene the documented hedging strategy.
- 2) Derivatives cannot be used to increase the risk position in the portfolio.

The objective of interest rate risk management is to protect the interest margin from changes in the interest rate environment.

To the extent that fixed rate assets are funded with fixed rate liabilities with the same maturities, there is no interest rate risk. If floating rate assets are funded at floating rate with the same index and the same repricing period no interest rate risk arises. An open risk position arises if the interest rate repricing dates of assets and liabilities in the portfolio differ. Such open positions can be hedged using cash instruments. Alternatively, the open risk position can be hedged with derivatives, usually interest rate swaps. The use of derivatives avoids liquidity risk and minimises counterparty risk.

## **I.B The risk to be hedged**

Interest rate risk is generally managed by hedging the interbank interest rate (market rate).

The interest rates of assets and liabilities from clients other than banks differ from the market rate for the same maturities:

- they are higher on the asset side because they contain additionally the customer credit spread and the margin for the loans, and
- the spread of the bank on liabilities from capital markets.
- they are lower for other liabilities because they contain the private client margin.

Interest rate risk is aggregated centrally in the macro hedging portfolio where the interbank interest rate risk is managed separately from currency, credit, liquidity and operational risks.

Hedging of the interbank interest rate risk refers to hedging that element of interest rate risk contained in the gross client rate of an asset or liability.

### **I.C Hedging the 'Net Position'**

Building a portfolio requires aggregating the necessary information (data) of all assets and liabilities that share the same risk to be hedged. Although systems differ, there is general agreement that the hedging process involves identification of notional amounts and repricing dates. As the economic risks of some financial instruments differ from their contractual terms, they have to be modelled to reflect their true economic effect on interest rate risk management. They are therefore included based on their behaviouralized repricing dates (statistical observations of customer behaviour) rather than their contractual repricing dates. These types of contracts include for example demand deposits, some (often regulated) saving accounts and prepayable loans.

The notional amounts of these assets and liabilities in the portfolio are then allocated to defined repricing buckets. Based on this allocation, the mismatch between assets and liabilities in each repricing bucket is derived, which is the net position.

For each net position, the company can decide whether it wants to hedge it fully or a portion of it. The extent of hedging to be undertaken is determined by the interest rate risk management strategy and is therefore a management decision as mentioned earlier in Section I.A.

When the amount of the net position has been designated for hedging, it is hedged with derivatives. For this, macro hedging uses mainly swaps. Effectively, these derivatives by themselves form a hedging portfolio which hedges the designated net position.

Following this basis of macro hedging, there is absolutely no necessity to relate any specific hedging instrument to a specific asset or liability in the portfolio (even if it is done by a software package that 'picks' suitable matching instruments until satisfied).

## **II. EFFECTIVENESS**

### **II.A. Definition**

Conceptually, the definition of effectiveness in macro hedging is the same as in a single instrument hedge. The bank has to demonstrate a high degree of correlation between the interest rate risk generated by the designated net position and the interest rate risk of the hedging instruments.

Effectiveness of hedging asks whether and to what degree the objectives of the hedging activity are met. The current exposure draft's logic does not ask this question in the light of management's objective, but in the light of measuring derivatives at fair value only. We believe that effectiveness should be assessed in the light of the objectives of the hedging policy.

For example, a company may wish to protect its net interest income from its banking business – managed under the accruals principle - against adverse changes in the market interest rate in future periods. Provided notional amounts and fixing periods or sensitivities are appropriately matched, it can do so by matching first long-term fixed interest from assets and liabilities and then changing long term fixed interest to short-term fixed interest (3 month fixing periods) by using swaps. It reduces the risk of net interest income fluctuations and takes the remainder into the short-term reporting periods: the amount of matching (natural offsetting) payment rights and obligations is multiple higher in the short-term period, so is the liquidity in the market for hedging remaining mismatches: cash instruments (next to swaps or futures). The objective of this hedging activity is not to protect the fair value of assets, but to protect net interest income in future periods. This is not on a discounted basis.

As with other hedge relationships, the effectiveness of macro hedging policies has to be assessed prospectively and measured retrospectively on an ongoing basis.

## **II.B. Prospective effectiveness**

Prospective effectiveness is the expected effectiveness of the macro hedge in the future. The current Exposure Draft does not provide guidance on how effectiveness should be tested.

As explained in section I.B., macro hedging defines the interbank interest rate as the only risk to be hedged. Liquidity and credit risk are excluded from this hedging relationship. Therefore a sufficient and robust method for testing effectiveness prospectively is to compare - in each repricing bucket - the nominal amounts/sensitivities of the designated net position and the hedging portfolio. If these amounts are equal (i.e. the net position of the hedging derivatives does not exceed the net position of the hedged portfolio), prospective effectiveness is assured for any interest rate scenario. This is especially true if a company hedges systematically and dynamically the designated net position with plain vanilla swaps.

Another possibility is to use sensitivity analysis. Under this method the fair value changes for the hedged items and for the hedging instruments are calculated, assuming different future changes of the current interbank interest rate curve. Sensitivity should be tested against parallel shifts as well as changes in the shape of the yield curve. Historic interest rate changes could be used as a basis for sensitivity analysis. The macro hedge is effective if the ratio of fair values changes from hedged items and hedging instruments is within the range of 80%-125%.

## II.C. Retrospective effectiveness

Retrospective effectiveness is the historical effectiveness of the macro hedge at the balance sheet date. The broad principles governing the measurement of effectiveness for macro hedging are no different from those commonly accepted for other hedge types.

### Portfolio net present value method:

As mentioned in section I.A., hedging the interbank interest rate risk refers to hedging a portion of interest rate risk that is contained in the gross client rates of assets or liabilities. For this all assets and liabilities in the portfolio have to be reflected on the basis of the interbank interest rate. This can be achieved, among other methods, by replicating the external contracts in a synthetic portfolio, whereupon the impact from interbank rate changes on the fair value of the contracts are calculated.

This ensures that the net present value of the assets and liabilities at inception of the hedge is zero. From here on any fair value changes in the portfolio are due to interbank interest rate movements (as represented by the swap yield curve) and can be measured reliably. This is distinct from fair valuing assets and liabilities in general as this is based on the gross client rate and impacted by changes in the margin as well as in the fair value of credit risk.

Measurement of effectiveness is done by comparing the historical change in the present value of the designated net position of the hedged portfolio with the historical change in the present value of the hedging portfolio. For retrospective testing, the company has to make a choice between measuring the fair value changes since the start of the hedge or since the last reporting date.

Doing the above implies the implementation of a complex and costly system to track the fair value changes on the designated portion of the hedged banking book. However, the same result can be achieved using a simplified method.

### Gapping Method

Since the replication process ensures that the interbank rates used for the hedged items are identical to the swap rates at inception of the hedge, the same result for effectiveness testing can be obtained by referring to the nominals/sensitivities in the respective repricing bucket. This is especially helpful to institutions which - as to the nature of their business (e.g. high numbers of small retail loans) - do not use the replication system.

Furthermore, so long as the net position of the hedging derivatives does not exceed the net position of the hedged portfolio for each repricing bucket (as described in section II.B), the valuation of the hedged portfolio is equal to the valuation of the hedging derivatives. As a result, the hedge is fully effective.

Therefore, under the simplified (gapping) method, the valuation of the designated portion of the hedged banking book is derived from the valuation of the hedging portfolio.

However, should the net position of derivatives exceed the net position of the hedged portfolio within a time band, the derivative portion which exceeds has to be closed. The value of that closing derivative represents the ineffectiveness that has occurred within the period.

The simplified method is only appropriate when the gaps are measured periodically and the derivative position adjusted accordingly. The frequency of remeasuring is determined by the stability as well as the complexity of the portfolio.

To summarize, the adoption of the macro hedging strategy as described in Section I. by a company guarantees that the hedge is fully effective, provided time bucket by time bucket the terms (notional, currency and interest rate basis) of the designated cash position and the net hedging derivatives position are the same. Full, effectiveness can also be demonstrated by other criteria such as sensitivity or duration.

Nevertheless, there are events out of the ordinary that can cause a macro hedge to be ineffective. Such ineffectiveness can only arise when actual events are different from the respective behavioural assumption (as mentioned in section I.C) which the model was based on, such as when the observed volume of prepayments, defaults on loans or deposits withdrawals differ.

Even then, these events do not always generate ineffectiveness. If these events lead to the portfolio being underhedged, no ineffectiveness occurs. This includes:

- Loan prepayments which are lower than anticipated for asset sensitive time buckets or loan prepayments which are higher than anticipated for liability sensitive time buckets.
- The opposite is true for unexpected liability withdrawals.

Ineffectiveness can only arise when these events lead to the portfolio being overhedged such as:

- Loan prepayments which are greater than anticipated can entail ineffectiveness only for asset sensitive time buckets. Loan prepayments lower than anticipated can also generate ineffectiveness for liability sensitive time buckets only.
- The opposite is true for unexpected liability withdrawals.

These situations can be assimilated to discontinued hedges.

To minimise situations of an overhedged portfolio, specific events can be anticipated when building the gaps, for example:

- Any loan portfolio which is deemed to be securitised is excluded from the macro hedging process and hedged for interest rate risk separately.

- Conservative assumptions on loan prepayments, loan default rates, deposit withdrawal velocities etc. are made, which will lead to underhedge the macro portfolio.
- Gaps are not necessarily fully hedged as mentioned in section I. A.

### III. ACCOUNTING

#### III.A. Introduction

The European banking industry has identified two potential accounting approaches for derivatives.

1. Cost accounting with ineffectiveness recorded in P& L.
2. Fair Value accounting with basis adjustment for hedged net position in one balance sheet caption only.

The method used to test for macro hedge effectiveness (net present value method or gapping method as described in section II.C.) does not determine the accounting approach to be used.

Under either approach, any ineffectiveness (which are caused by events that lead to an overhedged portfolio as described in section II.C.) that occurred has to be recognised immediately in P & L. However, it is impossible to identify the portion of the derivatives (and their value) that relates to the discontinued hedges. Since both the hedged items and the hedging derivatives are based on interbank interest rates, the ineffectiveness can be calculated from the discontinued hedged items. A loss (gain) on the cash item corresponds to a gain (loss) on the derivative. Under accruals accounting for derivatives, these amounts are amortised over the residual maturities of the derecognised items.

In fact, only the portions of the market value of the derecognised transaction corresponding to its contribution to the balances of the sensitive time buckets (as defined above) have to be recorded. However, by simplification, a company can choose to record the whole "market value".

In the case of an early termination of derivatives <sup>1</sup>, which can only happen if the company wishes to decrease its credit risk on derivatives with a positive market value or if it is required by the counterpart, the derivative is derecognised at cost (which usually differs from the termination payment) or at fair value, depending on the accounting status of the derivatives. Under cost accounting, the profit or loss from derecognition of the derivative is accrued until original maturity of the derivatives.

---

<sup>1</sup> The open position has to be closed by a new swap.

### III.B. Cost accounting for macro hedges derivatives

Under the cost accounting approach, the hedging derivatives are recognised on the balance sheet at (amortised) cost, to be consistent with the amortised cost accounting basis for the hedged items in the banking book. Any gains or losses arising from the hedging derivatives have to be recognised in the P&L at the same time as the counterbalancing gains or losses from the hedged net position (refer to our document “Principles for hedge accounting with derivatives”).

The cost accounting rules can be summarised as follows:

- Hedged Items: The hedged items are recognised in the balance sheet at cost (loans originated or liabilities) and in P & L on an accrual basis.
- Derivatives: Accounting for derivatives follows the accounting rules for hedged items. Therefore the derivatives are at cost in the balance sheet (with amortised up-front payment, if necessary) and accruals in P & L.
- Hedge Ineffectiveness: Since the fair value changes are not booked automatically to P & L, the ineffective portion has to be recognised in the balance sheet and the P & L as explained above.
- The changes in fair value of hedging instruments together with the corresponding changes of the hedged items should be reported in the notes to indicate the magnitude of hedging activities. Other disclosures about banking book sensitivity and hedging strategy would need to be made as well according to the New Basel Capital Accord (more particularly, Pillar 3).

### III.C. Fair Value Accounting for Derivatives with basis adjustment for hedged net position in one b/s caption only

Under this approach hedging derivatives must be recognised in the balance sheet at fair value, with corresponding changes in the P & L. The respective fair value from the hedged net position (resulting from changes in interbanking curve) need to be recognised in the balance sheet as well, with changes in the P & L.

If the Board is intent on maintaining the fair value measurement of all derivatives, then the gapping method (as described in section II.C.) can be used for accounting purposes. As long as there is no ineffectiveness, the fair value changes of the net cash position equals the fair value changes of the derivatives under the gapping method. This amount is adjusted in order to record ineffectiveness as mentioned above.

The fair value changes of the cash position calculated under the simplified method is recorded in a single balance sheet item. This is because – as demonstrated earlier – it is arbitrary and artificial to try and allocate the fair value change of the hedging instruments to specific assets or liabilities in the portfolio. Adjusting thousands of different assets and liabilities on a random selection basis is not only arbitrary and lacking logic; it is, moreover, unreasonable in the light of information provided to the users.



None of the adjusted financial instruments are fully at cost or fully at fair value. The adjustments are spread over numerous balance sheet captions. These adjustments to the carrying values of the underlying assets and liabilities should therefore be presented in a single balance sheet caption. This is not a question of meeting the framework's definition of assets and liabilities, but one of appropriate presentation. One entry under 'fair value (changes) of hedged financial instruments' would also be more useful to investors.

-----