DBOD. No. BP. 7 / 21.04.098/ 2005-06

April 17, 2006

All Commercial Banks
(Excluding RRBs)

Draft guidelines on improvements to banks' Asset Liability Management framework

Reserve Bank had issued guidelines on Asset Liability Management vide Circular No. DBOD. BP. BC. 94/ 21.04.098/ 99 dated February 10, 1999, which covered, among others, interest rate risk and liquidity risk measurement / reporting frameworks and prudential limits. As banks are aware, interest rate risk is the risk where changes in market interest rates might adversely affect a bank's financial condition. The immediate impact of changes in interest rates is on bank's earnings (i.e. reported profits) through changes in its Net Interest Income (NII). A long-term impact of changes in interest rates is on bank's Market Value of Equity (MVE) or Net Worth through changes in the economic value of its assets, liabilities and off-balance sheet positions. The interest rate risk, when viewed from these two perspectives, is known as 'earnings perspective' and 'economic value' perspective, respectively. The present guidelines to banks approach interest rate risk measurement from the 'earnings perspective' using the traditional Gap Analysis (TGA). To begin with, the TGA was considered as a suitable method to measure Interest Rate Risk. Reserve Bank had also indicated then its intention to move over to modern techniques of Interest Rate Risk measurement like Duration Gap Analysis (DGA), Simulation and Value at Risk over time, when banks acquire sufficient expertise and sophistication in acquiring and handling MIS.

2. Reserve Bank had advised banks on June 24, 2004 (c.f. circular DBOD. No. BP. BC. 103/ 21.04.151/ 2003-04) to assign explicit capital charge for interest rate risk in the trading book applying the standardised duration gap approach advocated by the Basel Committee on Banking Supervision. Since banks have gained considerable experience in implementation of the TGA and also become familiar with the application of the DGA to their trading books, it is felt that this would be an opportune time for banks to graduate to the Duration Gap Analysis for management

of Interest Rate Risk in its entirety. With this move, banks would fully migrate to application of the 'economic value perspective' to interest rate risk management.

3. In order to formulate suitable guidelines and to propose a framework for banks' full migration to DGA, the Reserve Bank had constituted a 'Working Group on Revision of Asset Liability Management System', (Chairperson - Smt. Meena Hemchandra, CGM, RBI) which included representation from RBI and commercial banks. The Working Group has since submitted its Report. The detailed draft guidelines prepared on the basis of the Group's recommendations, with suitable modifications, are furnished in Annex.

4. The salient features of the draft guidelines furnished in the Annex are:

i) Banks shall adopt the DGA for interest rate risk management in addition to the TGA followed presently.

ii) The proposed framework, both DGA and TGA, will be applied to all assets, liabilities and off balance sheet items of the bank.

iii) Keeping in view the level of computerisation and the current MIS in banks, adoption of a **uniform ALM System** for all banks may not be feasible. The proposed guidelines have been formulated to serve as a benchmark for banks. Banks which have already adopted more sophisticated systems may continue their existing systems but they should fine-tune their current information and reporting system so as to be in line with the ALM System suggested in the Guidelines.

iv) Banks should adopt the modified duration gap approach while applying the DGA to measure interest rate risk in their balance sheet from the economic value perspective. In view of the evolving state of computerisation and MIS in banks, a simplified framework has been suggested, which allows banks to

a) group assets and liabilities under the broad heads indicated in Appendix I under various time buckets; and

b) compute bucket-wise Modified Duration of these groups of assets/ liabilities using the suggested common maturity, coupon and yield parameters;

v) Reserve Bank is aware that measurement of interest rate risk with the above approximations does not reflect the true level of risk and hence would expect banks to migrate over time to application of the modified duration approach to each item of asset/ liability/ off-balance sheet item instead of applying it at the 'group' level. However, banks with the necessary IT support, MIS and skill capabilities may straightaway implement the more granular DGA by computing the Modified Duration of each item of asset, liability and off-balance sheet item.

vi) Each bank should set appropriate internal limits for interest rate risk based on its risk bearing and risk management capacity, with the prior approval of its Board / Risk Management Committee of the Board.

vii) Banks should compute the volatility of earnings (in terms of impact on Net Interest Income) and volatility of equity (in terms of impact on it –book value of net worth) under various interest rate scenarios.

viii) Banks should adopt a more granular approach to measurement of liquidity risk by splitting the first time bucket (1-14 days as at present) in the Statement of Structural Liquidity by dividing into two buckets viz. 1-7 days and 8-14 days. In addition to the existing prudential limits operating for the 1-14 days bucket and the 15-28 days bucket, the negative mismatch during the 1-7 days bucket should not exceed 20% of the cash outflows in that bucket. The frequency of supervisory reporting of the Structural Liquidity position shall be fortnightly instead of monthly, as at present.

5. The revised guidelines furnished in the Annex are issued as a draft for feedback from all concerned. The draft will be open for comments for a period of one month. Comments on the draft guidelines may be addressed to the undersigned at the address given below. They may also be sent by e-mail to Shri P.

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Yours faithfully,

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Annex

Draft guidelines on improvements to banks' Asset Liability Management framework

The broad framework of Modified Duration Gap approach would be as follows:

1. Scope

This framework would be applicable to all assets and liabilities of the bank, including off balance sheet items.

2. Adoption of earnings and economic value approach

Interest rates affect both the 'earnings' and 'economic value' of a bank and Interest Rate Risk (IRR) can be measured from both these approaches. The bucketing of assets, liabilities and off balance sheet items as per residual maturity/ repricing date in various time bands, as is being currently done, helps banks to measure the effect of interest rate movement on net interest income. Banks may use the same bucketing for computing the Modified Duration of the assets, liabilities and off balance sheet items and calculate the impact of interest rate risk on economic value of equity. Consequently, banks' management would have the benefit of both the analyses to facilitate their strategy and planning as regards IRR management. Therefore, to capture the impact of IRR on a bank's earnings and its net worth, banks may carry out both the analyses.

3. Bucketing in various time buckets

While assets and liabilities with fixed maturities are straightaway classified in the relevant time buckets based on residual maturity/ re-pricing date, there could be an element of variance in the manner of bucketing those items which do not have a fixed maturity. This calls for behavioural studies to be undertaken by banks in order to have a realistic assessment of the interest rate sensitivity, an issue which has already been highlighted in the present ALM guidelines. Banks should not only have appropriate systems to conduct such behavioural studies but also have a detailed framework to review these studies and their output periodically (say annually). Banks may apply the results of the behavioural studies on a consistent basis and may be changed **once a year in the first fortnight of April, if necessary** Banks may evolve a suitable mechanism, supported by empirical studies and behavioural analysis to estimate the future behaviour of assets and liabilities and off-balance sheet items with respect to changes in market variables. The banks may also take into account the embedded options and the risk on account of the same. Pending

such studies, banks may use the indicative framework for classification of certain assets and liabilities, alongwith the relevant yields, as furnished in Appendix I.

4. Introduction of additional time buckets

The past few years have seen banks' foray into financing long-term assets such as home loans, infrastructure projects, etc. hence, it is proposed to add the following time buckets to the existing Statement of Interest Rate Sensitivity viz; 'above 5 years and up to 7 years', 'above 7 years and up to 10 years' and 'above 10 years and up to 15 years' and '15 years and above'. The existing and proposed time buckets for the Statement of Interest Rate Sensitivity is given below:

Statement of Interest Rate Sensitivity –

Sr. No.	**Existing time buckets**	**Proposed time buckets**
1.	1-28 days	1-28 days
2.	29 days and up to 3 months	29 days and up to 3 months
3.	Over 3 months and up to 6 months	Over 3 months and up to 6 months
4.	Over 6 months and up to 1 year	Over 6 months and up to 1 year
5.	Over 1 year and up to 3 years	Over 1 year and up to 3 years
6.	Over 3 years and up to 5 years	Over 3 years and up to 5 years
7.	Over 5 years	Over 5 years and up to 7 years
8.	Non-sensitive	Over 7 years and up to 10 years
9.		Over 10 years and up to 15 years
10.		Over 15 years
11.		Non-sensitive

5. Grouping of assets and liabilities in time buckets

While the approach of calculating the precise Modified Duration of each individual asset, liability and off-balance sheet position and aggregating the same would enhance the accuracy of calculation, it may lead to an increase in volume and complexity of calculation. Further, the feasibility of this approach would depend on a bank's IT infrastructure (availability of core banking solution, MIS capability), staff skills, size of the branch network, etc. It is, therefore, felt that banks need to be allowed certain extent of flexibility in applying the proposed framework. Accordingly those banks which are not equipped to compute the modified duration of their assets, liabilities and off balance sheet items for each of those items may

a) group assets and liabilities under the broad heads indicated in Appendix I under various time buckets; and

b) compute bucket-wise Modified Duration of these groups of assets/ liabilities using the suggested common maturity, coupon and yield parameters;

The Modified Duration Gap computed as above would be a simpler method and may also lead to a cost- benefit advantage, in spite of the approximations in the calculation of Modified Duration. However, banks may endeavour to develop granular item-wise calculation methods to calculate modified duration more accurately.

6. Approach for computing modified duration

The following approach for calculation of modified duration may be adopted by banks :

Sr.	Balance Sheet and Off-Balance Sheet Items	Approach for Modified Duration
1.	Investments	Compute the actual Modified Duration for each item of the bank's investment portfolio.
2	Assets / liabilities in foreign currency	The assets and liabilities in foreign currency will be converted into Indian Rupees using the relevant spot closing rates as published by FEDAI. Modified duration for each item of assets and liabilities will be computed using the yields as appropriate.
3.	Derivative instruments (other than options)	Banks may use their own methodologies for computing the modified duration of their derivatives portfolio. One possible method for computing modified duration for the derivatives portfolio could be as follows: All derivatives which have a forward component should be considered as a combination of two positions in bonds. Accordingly, banks should compute the actual modified duration for each item of the derivatives portfolio and plot them as assets (receivables) or liabilities (payables) in the appropriate time buckets. Interest Rate Swaps could be considered as a combination of a short position and long position. The notional of the fixed and floating leg of an Interest Rate Swap could be shown in the respective maturity bucket based on the *maturity date for the fixed leg* and *the reset date for the floating leg*. Suppose, a bank receives 5-year fixed and pays floating MIBOR, then the fixed leg of the swap could be shown as positive in the '5-7 year' bucket and the floating leg would be shown as a negative in '<1 month' bucket.

Sr.	Balance Sheet and Off-Balance Sheet Items	Approach for Modified Duration
		Forward rate agreements could also be considered as a combination of a short position and long position. For instance, a long position in a September three month FRA (taken on June 1), can be bucketed as a long position, with a maturity of six months and a short position with maturity of three months. The amount to be shown in the Statement of interest rate sensitivity is the notional of the FRA. Interest Rate Futures could be treated in a similar manner as a Forward Rate Agreement. Thus, the notional of the interest rate future should be shown in the relevant buckets in the Statement of Interest Rate Sensitivity.
4.	Derivatives - Options	FC – INR options: The 'delta' times the notional value amount (based on the strike price) could be shown in the respective maturity bucket as an outflow / inflow based on the option. For instance, if a bank has a USD 1 mio. long call Rupee dollar option (where in the bank buys the USD against INR) at a strike price of Rs.44.00 at the end of 2 months and say the delta of this option is 0.45. For the purpose of bucketing in the Statement of Interest Rate Sensitivity, the bank may take Rs 1.98 crore (viz. 1mio * 44 * 0.45) as an outflow in the 1-3 month time bucket. For the purpose of computing the modified duration, the bank may use the MIFOR curve for the discounting rate. Cross currency options : Adopt the same methodology as for FC – INR options except that the relevant conversion rate (using the FEDAI closing rate) and the appropriate yield curve should be used.
5.	All other items	Each bank will have to decide either to have an individual account-wise approach to calculation of Modified Duration or aggregate various items of assets and liabilities (in groups) in the respective time buckets as indicated in paragraph 5 above and thereafter work out the Modified Duration taking mid-points of the time buckets as the maturity date, and apply the relevant coupon and yields as indicated in Appendix I.

7. Market value of equity/ net worth

Banks may compile the ALM statements on Modified Duration Gap basis for the Balance Sheet as a whole, which would be a combination of the Banking and Trading books of a bank. Trading Books currently comprise securities included under Held for Trading and Available for Sale

categories and derivatives positions. Banks may commence appropriate integration of interest rate risk as evidenced by these statements into their capital and strategy planning exercises.

8. Methodology for computing Modified Duration Gaps

The step-by-step approach for computing modified duration gap is as follows:

1. Identify variables such as principal amount, maturity date / re-pricing date, coupon rate, yield, frequency and basis of interest calculation for each item / category of asset / liability.
2. Generate the bucket-wise cash flows for each item / category of asset / liability/ off balance sheet item.
3. Determine the yield curve for arriving at the yields based on current market yields / current replacement cost for each item / category of asset / liability/ off-balance sheet item as proposed in the framework above.
4. The mid-point of each time bucket may be taken as a proxy for the maturity of all assets and liabilities in that time bucket.
5. Calculate the Modified Duration of each category of asset / liability/ off balance sheet item using the maturity date, yield, coupon rate, frequency, yield, basis for interest calculation for each category of asset/ liability/ off balance sheet item.
6. Determine the weighted average Modified Duration of all the assets (DA) and similarly for all the liabilities (DL), including off balance sheet items.
7. The Modified Duration Gap is derived by the equation:

   DGAP = Modified DA – W x Modified DL

   where

   W = RSL/RSA (Rate Sensitive Liabilities / Rate Sensitive Assets).

   DA= Weighted average Modified Duration of assets and

   DL= Weighted average Modified Duration of liabilities.

9. Calculation of Modified Duration of Equity

Along with Modified Duration Gap, banks may also compute Modified Duration of Equity to enable easier comparison of IRR amongst banks. The same may be computed as per the framework given below.

(Note: Equity in this example refers to capital funds)

- Modified Duration of Equity = DGAP x Leverage

- Leverage = RSA / Equity (which indicates extent to which equity has been leveraged to create assets)

Illustration:
A detailed illustration of the application of the modified duration approach is furnished as Appendix II. The net position of which is furnished below:

(Rs. in crore)

Economic Value of Equity	**Amount**
Net worth	1350.00
RSA	18251.00
RSL	18590.00
Modified Duration of Gap	
DA (Weighted Modified Duration of Assets)	1.96
DL (Weighted Modified Duration of Liabilities)	1.25
Weight = RSL/RSA	1.02
DGAP = DA – W x DL	0.69
Leverage Ratio = RSA / (Tier 1 + Tier 2)	13.52
Modified Duration of Equity = DGAP x Leverage Ratio	9.34
For a 200 bp Rate shock the drop in equity value is	18.68% (9.34 x2)

Banks may apply the above methodologies to Assets, Liability and Equity.

10. Reporting format of the Statement of Interest Rate Sensitivity

Currently banks are reporting interest rate sensitivity as a part of DSB returns which is based on the maturity gap approach. In addition to extant reporting, interest rate sensitivity as per revised methodology may be in the formats stipulated in Appendix III on a monthly basis.

11. Risk management and control issues

As a step towards enhancing and fine-tuning the existing risk management practices in banks, Guidance Notes on Credit Risk Management and Market Risk Management were issued to banks on October 12, 2002, giving indicative guidelines for effective credit risk and market risk management. Additionally, banks may ensure that :

i) Each bank should set appropriate internal limits on individual gaps based on the individual bank's risk perception, with the approval of its Board / Risk Management Committee. These internal limits may be linked to the book value of networth (for modified duration gap) and the Net Interest Income (for maturity gap). Further, the Board / ALCO must also periodically review the above limits on individual buckets after assessing various scenarios of interest rates and the resultant volatility of earnings in terms of Net Interest Income.

ii) The institutionalised framework of the ALCO in banks must be strengthened and the ALCO's prior approval must be taken for deciding upon yields, assumptions used / proposed to be used, bucketing, behavioural studies, etc. for duration gap analysis. They must also ensure the same are compliant with regulatory prescriptions. Banks must also put in place a transparent system of recording the discount rates used for various items of asset and liabilities, assumptions used, etc.

iii) It is also imperative that material assumptions made, if any, are updated regularly to reflect the current market and operating environment. Further, the process of developing material assumptions should be formalized and reviewed periodically (say annually).

iv) Banks should measure their vulnerability to loss in stressed market conditions, including the breakdown of key assumptions, and consider these results when establishing and reviewing their limits and policies in respect of IRR. The possible stress scenarios suggested by the Group include: changes in the general level of interest rates, e.g. a change in the yield by 200 basis points or more in a year (changes in interest rates in individual time bands to different relative levels (ie. yield curve risk), changes in volatility of market rates, etc.

v) Banks must adopt the practice of periodic model validation. Thus, where internal models / software packages are being used, the integrity and validation of data being used to generate the results, its validation and functioning of the entire system of interest risk management should be subjected to an independent audit either by an experienced internal auditor or external auditor who is conversant with risk management processes. The Audit Committee of the Board (ACB) would be responsible to ensure suitability of auditors after a proper due diligence process.

vi) Banks must give proper importance for all documentation in respect of discount rates, assumptions used / proposed to be used, bucketing, behavioural studies, validation process etc. All material assumptions, regardless of the source, should be supported with analysis and documentation. Banks may ensure that sufficient documentation is made available at the time of internal audit, statutory audit and RBI inspection.

12. Issues related to liquidity risk management

i) Bucketing in time bands

The current 1-14 days time bucket would be made granular and divided into two time bands of 1-7 days and 8-14 days. Banks may, however, maintain and monitor the daily buckets on an on going basis for a sharper assessment of the concerns relating to liquidity. The other existing time buckets for the Statement of Structural Liquidity would be retained.

ii) Prudential limits for negative mismatches

In addition to the existing prudential limits operating for the 1-14 days bucket and the 15-28 days bucket, the negative mismatch during the 1-7 days bucket should not exceed 20% of the cash outflows in that bucket.

iii) Reporting frequency

The frequency of submission of the Structural Liquidity Statement to RBI would be fortnightly in keeping with the granularity of the 1-14 days bucket.