THE BERMUDA MONETARY AUTHORITY

BANKS AND DEPOSIT COMPANIES ACT 1999:

The Monitoring and Control of Interest Rate Risk

May 2007

Introduction

1. This paper sets out the standards that the Bermuda Monetary Authority ('the Authority') expects of licensed institutions with regard to the monitoring and control of interest rate risk as part of their overall processes for ensuring effective management of all types of risk to which they are exposed in their operations. It has been the subject of detailed consultation with the banking industry based on a Consultation Paper published in January 2007.

2. The Authority maintains institutions' systems and controls under review as part of its ongoing prudential supervision in order to ensure that they are prudently managed and meet on an ongoing basis the minimum licensing criteria set out in the Second Schedule to the Banks and Deposit Companies Act 1999 ('the Act'). Consistent with this, licensed institutions must develop and implement satisfactory arrangements for measuring, monitoring and controlling the interest rate risk that is inherent in their operations. The particular arrangements will vary from institution to institution, having regard to the nature, complexity and range of their activities; but institutions need to keep their arrangements under regular review, as their business changes and develops, to ensure that they are such as to permit them to identify all material risks and to control them effectively.

3. The Authority needs to satisfy itself that institutions have effective arrangements in place for interest rate measurement, monitoring and control, within the overall framework of risk controls that is developed and applied. The Authority must also be satisfied that institutions hold adequate capital to support the totality of the risks in their business. In particular, in the context of the forthcoming Revised Basel Framework on Capital Measurement and Capital Standards ('Basel 2'), the Authority will undertake specific review of institutions' vulnerability to interest rate risk within the banking book (non-trading activities), as part of its Pillar 2 assessment of the overall adequacy of their capital resources.

Interest Rate Risk

4. Interest rate risk is the exposure of an institution's financial condition to adverse movements in interest rates. Such risk is a normal part of banking, and exposure to it can be an important source of profitability and shareholder value. However, where risk is excessive, the threat to earnings and capital can be significant. Changes in interest rates affect earnings by changing net interest income as well as the level of other interest-sensitive income and expenses. Such changes also affect the underlying value of assets, liabilities and off balance-sheet instruments, and hence the economic value of the institution, since the present value of future cash flows (and sometimes the cash flows themselves) change as interest rates shift. An effective risk management process that maintains interest rate risk within prudent limits is therefore essential to an institution's safety and soundness.

5. Most commonly, institutions will encounter interest rate risk in their business in the following ways:

   i. re-pricing risk – reflecting timing differences in the maturity (for fixed rate) and re-pricing (for floating rate) of bank assets, liabilities and off balance-sheet positions;

   ii. yield curve risk – re-pricing mismatches under (a) above also expose institutions to potential loss in the event of a change in the slope or shape of the yield curve;

   iii. basis risk – the value of instruments with similar re-pricing characteristics may shift as interest rates change, for example as divergences arise between the underlying indexes against which different instruments are priced; and

   iv. optionality – many non-trading bank assets, liabilities and off balance-sheet instruments contain embedded options (eg 'call' or 'put' provisions on bonds or notes, loans with prepayment options, and non-fixed deposit instruments) which clients may exercise in response to interest rate shifts.

   The effect of such risks can be material for an institution, both from an earnings and an economic value perspective, and institutions must be alert in seeking to identify the potential impact.

Oversight Framework for Interest Rate Risk

6. An institution's Board of Directors and senior management must exercise adequate oversight of interest rate risk. The Board should approve appropriate policies and strategies and ensure that senior management implements arrangements for monitoring and controlling the risks in a manner that is consistent with the approved policies and strategies. Such policies should also include identifying lines of authority and responsibility for monitoring and managing the exposure. The Board (or a specific Committee of the Board) should also receive regular and timely detailed reports on the institution's interest rate risk exposure to ensure that they are comfortable with the risks that are being run. The Board should also review regularly the continuing appropriateness of the policies and strategies that are applied.

7. Senior management must ensure that an effective framework of monitoring and control is in place, enabling both day-to-day oversight and the identification of longer term issues. Such a framework must include reporting arrangements that are appropriate for the institution's business, appropriate limits on risk taking, the availability of staff resources with the requisite knowledge and skills to operate the controls, and adequate separation of duties in the key elements of the risk

management process in order to avoid potential conflicts of interest. Where appropriate, limits should be further specified for certain types of instruments, portfolios and activities, together with position-taking opportunities and hedging strategies. Particular care needs to be taken with new products and activities to ensure they are subject to adequate operational procedures and proper framework of monitoring and control before being introduced.

8. The interest rate risk management process needs to be subject to proper review and evaluation of its effectiveness, as an integral part of an institution's overall system of internal control. Where institutions have complex risk exposures, they need to ensure that their relevant measurement, monitoring and control functions are subject to regular independent review (which may be internal or external) to assess effectiveness. Regular reporting of interest rate risk exposure is an important element of internal control. Reports prepared for senior management and the Board of Directors should at a minimum include the following:
   i. summaries of the institution's aggregate exposures;
   ii. reporting of compliance with policies and limits;
   iii. key assumptions eg with regard to non-maturity deposit behaviour;
   iv. results of stress tests;
   v. any finding of reviews of policies, procedures and systems, including by internal or external audit.

   Institutions are also expected to release to the public certain information on the level of their interest rate risk and on their policies for managing it.

Measurement of Interest Rate Risk

9. Institutions must have interest rate risk measurement systems that enable them to identify all sources of material interest rate risk and to record and track the effects of interest rate changes exposures. The assumptions underlying the risk measurement systems must be clearly understood by risk management staff as well as by senior management. Such systems need to cover interest rate risk arising from the full scope of an institution's activities, including both trading and non-trading activities. The measurement system should address all material sources of interest rate risk including re-pricing, yield curve, basis and option risk exposures. Such systems should be reviewed and validated on a regular basis.

10. A variety of techniques are available for measuring the interest rate exposure of both earnings and economic value. These range from simple calculations to simulation techniques which may be either static or involve more complex and sophisticated dynamic modeling. Institutions need to determine the techniques that are appropriate, given the extent and nature of interest rate risks arising in their business. At a minimum, the Authority would normally expect institutions to employ a suitable form of gap analysis to assess the interest rate risk of current earnings as well as some related estimate of the risk to economic value. (An

institution which believes such an approach is not the most suitable for its particular business is free to consider an alternative but should discuss its proposals at an early stage with the Authority). A gap analysis is based on a maturity/re-pricing schedule that distributes interest-sensitive assets, liabilities and off balance-sheet positions into time-bands, where the size of the gap for a given time-band (e.g. assets minus liabilities plus off balance-sheet exposures that re-price or mature within the time-band) provides a measure of the institution's re-pricing risk exposure. In addition, sensitivity weights, typically based on the duration of assets and liabilities within each time-band, can then be used in combination with the maturity/re-pricing schedule to provide an indication of the likely change in economic value of the institution as a result of particular changes in interest rates.

11. Particular attention should be given to positions for which behavioural maturity differs from contractual maturity and to positions denominated in different currencies. Savings/ sight deposits may have contractual maturities or may be open-ended, but depositors will generally have an option to make withdrawals at any time. Changes in interest rates may therefore have an effect on the timing of cash flows (in addition to their value) in ways that can be difficult to predict. Where material positions are held in different currencies, there is a different interest rate risk in each currency which institutions should consider separately. Alternatively, institutions may include within their risk measurement process methods for aggregating exposures in different currencies using assumptions about the correlation between interest rates in the different currencies.

Interest Rate Risk Limits

12. Institutions need to set parameters for acceptable interest rate risk exposure over a range of possible changes in interest rates, using limits and risk-taking guidelines to control their risk. Reporting arrangements need to ensure that positions exceeding predetermined levels are promptly identified for management attention, with a clear policy as to the handling of exceptions. Set limits must be consistent with an institution's overall measurement approach, with an aggregate limit approved by the Board of Directors (or a specific Committee of the Board) and subject to periodic review. Limits must be appropriate to the size, complexity and capital strength of the institution, as well as to its ability to measure and manage its risk. Where appropriate, sub-limits may be applied for individual business units, portfolios, types of instrument or for specific instruments.

Stress Testing

13. An institution's risk measurement system should also be such as to support a meaningful evaluation of the effect of stressful market conditions on its business. Stress testing should be designed to provide information on the types of conditions under which the institution's strategies or positions would be most vulnerable –

including sudden changes in the general level of interest rates, changes in the relationships among key market rates (basis risk), changes in the slope and shape of the yield curve, changes in the liquidity of key financial markets or changes in the volatility of market rates. Consideration should be had to 'worse case' scenarios in addition to more probable events. Regard should also be had to conditions in which key business assumptions and parameters may break down, as well as to issues such as the existence of concentrations in particular instruments or markets where positions may be much more difficult to liquidate or offset in stressful situations.

Information for Supervisors

14. The Authority seeks to determine on an ongoing basis that institutions have in place effective and appropriate arrangements for measuring, monitoring and controlling their interest rate risk. In reviewing institutions' internal systems for monitoring interest risk in the banking book, the Authority needs to be satisfied that they meet the basic requirements set out in Appendix 1 to this paper. As part of its review process, the Authority also needs to obtain regular information on institutions' internal measurement systems for interest rate risk. The Authority does not intend to develop a standard reporting framework for monitoring institutions' interest rate risk. Rather, it will remain for institutions' management to develop and apply appropriate internal measurement systems (both at the level of solo licensed entities and on a group consolidated basis), having regard to the nature and scale of their individual businesses. The Authority holds bilateral discussions with institutions regarding the measurement, monitoring and control arrangements they have in place, and agrees in each case the nature of the reports on interest rate exposures in the banking book that are to be provided to it, usually on a quarterly basis.

15. Normally, the regular reports to be provided to the Authority will be drawn from the management information packages developed by each institution. However, where the Authority cannot be satisfied as to the adequacy of an institution's internal measurement and reporting system, it may, exceptionally, have to specify certain additional reporting which it may use as the basis for its own estimates of risk in assessing the adequacy of the institution's capital.

16. As part of its assessment of institutions' interest rate risk arrangements, the Authority will review with them the effect, expressed in terms of the threat to their economic value, of a standardized interest rate shock. At a minimum, this will involve assessing the effect of either

    i. an upward or downward 200 basis point parallel shift in the yield curve; or

    ii. 1st and 99th percentile of observed interest rate changes using a one-year (240 working days) holding period and a minimum of five years of observations.

Where 5% or more of banking book assets or liabilities are denominated in another currency, separate calculations should normally be undertaken for each such currency. An exception to this may be made in the case of currencies, such as the Bermuda dollar, that are pegged to the US dollar where that link has, over a period of years, proved stable and there is no impediment, such as exchange control regulations, restricting access to the US currency. At the same time, depending on the nature and scale of the risks involved in particular cases, the Authority will also discuss with institutions whether it may be necessary to consider other scenarios within a standardized rate shock assessment, for example to have regard to yield curve twists, inversions etc.

Appendix 1
Internal Measurement Systems for Interest Rate Risk

Institutions' internal systems for capturing interest rate risk in their banking book operations must meet the following criteria:

1 All material interest rate positions associated with their banking book assets, liabilities and off balance-sheet positions must be assessed. Internal systems must accurately incorporate all interest rate sensitive on-and off balance-sheet holdings.

2 Generally accepted financial concepts and risk measurement techniques must be used. In particular, internal systems must be capable of measuring risk using both an earnings and an economic value approach. The monitoring of interest rate risk in the banking book for supervisory purposes must reflect risk as measured by the economic value approach.

3 Data inputs must be adequately specified (having regard to the nature and complexity of the institution's holdings) with regard to rates, maturities, repricing, embedded options, and other details needed to provide a reasonably accurate representation of changes in economic value or earnings.

4 The assumptions that are used to transform positions into cash flows must be reasonable, properly documented, and stable over time. This is particular important for assets and liabilities whose behaviour differs markedly from contractual maturity or repricing, and for new products. Material changes to assumptions should be documented, justified and approved by management.

5 Interest rate risk measurement systems must be integrated into the institution's daily risk management practices. The output of the systems should be used in reporting the level of interest rate risk to senior management and the Board of Directors (or a specific Committee thereof).

6 The interest rate shock identified in paragraph 16 (or equivalent parameters) has been properly incorporated into the internal systems.