MFSA

MALTA FINANCIAL SERVICES AUTHORITY

BANKING UNIT

BANKING NOTICES

NOTICE ON INTEREST RATE RISK MANAGEMENT BY CREDIT INSTITUTIONS AUTHORISED UNDER THE BANKING ACT 1994

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NOTICE ON INTEREST RATE RISK MANAGEMENT BY CREDIT INSTITUTIONS LICENSED UNDER THE BANKING ACT 1994

INTRODUCTION

1. The Malta Financial Services Authority as the competent authority ('the authority') appointed in terms of Section 3 (1) of the Banking Act 1994 ('the Act') considers that the sound management of the exposure of a credit institution's financial condition to adverse movements in interest rates, of crucial importance. Credit institutions are exposed to this type of risk due to borrowing or investing funds in interest-bearing assets. In this Notice on Interest Rate Risk Management ('the Notice') the authority is forwarding its views on Interest Rate Risk Management in order to provide guidance to all credit institutions licensed under the Act.

2. It is not the purpose of this Notice to set specific rules for credit institutions on interest rate risk management. The Notice should be construed as being a best practice guideline on how to maintain interest rate risk exposure within certain limits. The authority is increasingly emphasising the importance of sound risk management processes and strong internal controls when assessing credit institutions. In its assessment the authority also considers that the manner in which this risk is managed, must be compatible with the complexity of the credit institutions' balance sheet and activities.

3. The Notice is modelled on the main requisites of a policy paper entitled *'Principles for the Management of Interest Rate Risk'*, issued by the Basle Committee on Banking Supervision of the Bank of International Settlements dated September 1997.

INTEREST RATE RISK

4. Interest rate risk is the exposure of a credit institution's financial condition to adverse movements in interest rates. Movement in interest rates is a normal banking risk, and can be an important source of profitability and shareholder value. However, excessive interest rate risk can pose a significant threat to earnings and capital base.

5. Changes in interest rates affect credit institutions' earnings by changing net interest income and the level of other interest sensitive income and operating expenses. Interest rate changes also affect the underlying value of assets, liabilities and off-balance sheet instruments because the present value of future cash flows changes with interest rate movements. Therefore an effective risk management process shall maintain interest rate risk within prudent levels, which is essential to the safety and soundness of the credit institutions.

SOURCES OF INTEREST RATE RISK

6. Sources of interest rate risk, which are briefly described below, include:

Repricing Risk

The primary form of interest rate risk faced by credit institutions arises from the timing differences in the maturity (for fixed rate) and repricing (for floating rate) of their assets, liabilities and off-balance sheet positions. Repricing mismatches are fundamental to the business of banking, however they expose an institution's income and underlying economic value to unanticipated fluctuations, as interest rates vary.

Yield Curve Risk

Repricing mismatches can expose a credit institution to changes in the slope and shape of the yield curve. Yield curve risk arises when unanticipated shifts of the yield curve have adverse effects on a bank's income or underlying economic value.

Basis Risk

An important source of interest rate risk faced by credit institutions arises from the imperfect correlation in the adjustment of the rates earned and paid on different instruments, with otherwise similar repricing characteristics. When interest rates change, these differences can give rise to unexpected changes in the cash flows and earnings spread between assets, liabilities and off-balance sheet instruments of similar maturities or repricing frequencies.

Optionality

This risk arises from the options embedded in credit institutions' assets, liabilities and off-balance sheet portfolios. An option provides the holder the right, but not the obligation, to buy, sell, or in some manner alter the cash flow of an instrument or financial contract. Options may be stand-alone instruments such as exchange-traded options and over-the-counter (OTC) contracts, or embedded within otherwise standard instruments.

7. Institutions may use exchange-traded and OTC options in both trading and non-trading accounts, the instruments with embedded options being generally most important in non-trading activities. They include various types of bonds and notes with call or put provisions, loans which give borrowers the right to prepay balances, and various types of non-maturity deposit instruments which give depositors the right to withdraw funds at any time, often without penalty payments.

8. The asymmetrical payoff characteristics of instruments with optionality features can pose a significant risk particularly to those who sell them, since the options held, both explicit and embedded, are generally exercised to the advantage of the holder and disadvantage of the seller. Care must taken by credit institutions on the increasing array of options that may involve

significant leverage and can significantly magnify the positive and negative influences of option positions on the institutions' financial strength.

EFFECTS OF INTEREST RATE RISK

9. The effects of interest rate risk, which are briefly discussed below, are:

Earnings Perspective

The earnings perspective focuses on the impact of changes in interest rates on accrual or reported earnings. Variation in earnings is an important focal point for interest rate risk analysis because reduced earnings or outright losses can threaten the financial stability of a credit institution by undermining its capital adequacy and by reducing market confidence. An earnings component, is the net interest income, which reflects both the importance of net interest income in the credit institutions' overall earnings and its link to changes in interest rates.

The authority acknowledges that credit institutions have expanded their activities, which generate fee-based and other non-interest income, and in this respect a broader focus on overall net income, incorporating both interest and non-interest income and expenses, is expected.

The non-interest income arising from many activities, such as loan servicing and various asset securitisation programs, can be highly sensitive to market interest rates. This also applies to traditional sources of non-interest income, such as transaction processing fees. Therefore credit institutions are expected to take a broader view of the potential effects of changes in market interest rates on their earnings and to factor these broader effects into their estimated earnings under different interest rate environments.

Economic Value Perspective

Variation in market interest rates can also affect the economic value of the credit institution assets, liabilities and off-balance sheet position. The economic value of an instrument represents an assessment of the present value of its expected net cash flows, discounted to reflect market rates. Therefore the institution can view its economic value as the present value of expected net cash flows, defined as the expected cash flows on assets minus the expected cash flows on liabilities plus the expected net cash flows on off-balance sheet positions.

Embedded Losses

A credit institution should also consider the impact that past interest rates may have on future performance. In particular, instruments that are not marked to market may already contain embedded gains or losses due to past rate movements. These gains or losses may be reflected over time in the institution's earnings.

INTEREST RATE RISK MANAGEMENT

10. The authority considers that a sound interest rate risk management process must involve the application of the following key elements:

- ✍ Board and Senior Management oversight;
- ✍ Adequate risk management policies and procedures;
- ✍ Risk measurement, monitoring and control functions; and
- ✍ Comprehensive internal controls including independent audits.

11. The manner in which a credit institution applies these elements in the management of interest rate risk will depend upon the complexity and nature of its interest bearing assets and related activities, as well as on the level of interest rate risk exposure. As is the case of other risk factor categories credit institutions are expected to monitor interest rate risk on a solo and on a consolidated basis, as applicable. Such monitoring is to include interest rate exposure to subsidiaries.

THE ROLE OF THE BOARD OF DIRECTORS AND SENIOR MANAGEMENT

12. The authority considers that effective Board and Senior Management oversight of a credit institution's interest rate activities, is of critical importance to a sound risk management process. In carrying out their responsibilities, the Board of Directors would be expected to:

- ✍ approve the broad business strategies and policies that govern or influence the interest rate risk of the credit institution;
- ✍ review the credit institution's overall objectives regarding interest rate risk, and ensuring the provision of clear guidelines regarding the acceptable level of this risk;
- ✍ ensure to be regularly updated on the institution's interest rate risk exposure in order to be able to effectively monitor and control this risk;
- ✍ either directly or indirectly through a specific committee, regularly review and re-evaluate the interest rate risk management policies and takes the necessary steps to identify, measure, monitor and control these risks;
- ✍ ascertain that Senior Management understands the risks incurred; and
- ✍ ensure that sufficient personnel with the necessary technical skills to evaluate and control these risks are available.

13. In addition to the duties pertaining to the Board of Directors in the risk management process, Senior Management is also expected to:

- ✍ maintain adequate internal policies and procedures for the management of interest rate risk and establish clear lines of authority including limits and responsibility for managing and controlling this risk;

- ✍ ensure that effective internal controls are in place for the periodical review of the interest rate risk management policies and procedures thus confirming their validity;

- ✍ ensure that interest rate risk reports provide aggregate information as well as sufficient supporting details to enable management and Board of Directors to assess the sensitivity of the institution to changes in market conditions and other important risk factors;

- ✍ hold meetings with Board members and with risk management staff regarding risk measurement, reporting and management procedures depending on the size and complexity of the credit institution; and

- ✍ ensure that competent staff with the necessary technical knowledge and experience carry out the analysis and risk management activities that are related to interest rate risk.

LINES OF RESPONSIBILITY AND AUTHORITY

14. Credit institutions are expected to have in place internal procedures with clear lines of responsibility and authority, preferably based on the framework indicated in paragraphs 15 to 17 below.

15. Individuals/committees responsible for interest rate risk management must have clearly defined duties that are sufficiently independent from position taking functions. Moreover all activities and aspects of interest rate risk shall be covered by the credit institution's risk management process. Senior Management shall define lines of authority and responsibility for developing strategies, implementing tactics and conducting the interest rate risk management and reporting function.

16. An adequate separation of duties in key elements of the risk management process is to be implemented to avoid potential conflicts of interest. Sufficient safeguards are to be available and compatible with the size and structure of the institution. Larger credit institutions would normally set up a designated independent unit responsible for interest rate risk management, monitoring and control.

17. The personnel responsible for measuring, monitoring and controlling interest rate risk must be knowledgeable in all possible types of interest rate risk throughout the credit institution.

ADEQUACY OF RISK MANAGEMENT POLICIES AND PROCEDURES

18. Credit institutions are to have a statement of clearly defined policies and procedures for limiting and controlling interest rate risk, appropriate to the types of risk arising from the nature and complexity of their activities. These limits are to be applied on a consolidated basis and reviewed periodically. Interest rate risk policies should also identify quantitative parameters that define the acceptable level of interest rate risk.

19. The policy statement should clearly identify the types of instruments and activities that the institution may employ or conduct, describing the purposes or objectives for their use.

20. Credit institutions are urged to analyse and identify the interest rate risk inherent in new products and activities, prior to their launching, ensuring that adequate operational procedures and risk control systems are available.

21. The Board of Directors or a committee delegated by the Board must approve all major hedging or risk management initiatives that are to be undertaken.

22. A proposal to enter into a new product, activity or strategy must contain:

- ✍ A description of the specific product or strategy;
- ✍ A identification of the necessary resources to establish a sound and effective interest rate risk management, for product or activity;
- ✍ An analysis of the feasibility of the proposed activities commensurate to the overall financial condition and capital level of the credit institution; and
- ✍ The procedures to measure monitor and control the risks of the proposed product or activity.

RISK MEASUREMENT MONITORING AND CONTROL FUNCTIONS

23. The authority feels that it is imperative for credit institutions to have measurement systems capturing all material sources of interest rate risk and assessing the effect of interest rate changes on both earnings and capital.

24. An effective measurement system must:

- ✍ Assess all material in respect of interest rate risk associated with the institution’s assets, liabilities, and off-balance sheet positions;
- ✍ Utilise generally accepted financial concepts and risk measurement techniques; and
- ✍ Have well-documented assumptions and parameters.

25. It is desirable for measurement systems to include interest rate risk exposures arising from the full scope of a credit institution's activities, including both trading and non-trading sources. Management must have an integrated view of interest rate risk across products and business lines.

OPERATING LIMITS

26. Credit institutions should establish and enforce operating limits, which maintain exposures within the terms of their internal policies.

27. The objective of interest rate risk management is to maintain interest rate exposures within set parameters over a range of possible changes in interest rates. Limit systems must additionally ensure that excesses over certain predetermined levels receive prompt management attention. These operating limits must be consistent with the credit institution's approach to measuring interest rate risk, and must also reflect the institution's size, complexity and capital adequacy, and effective measurement capability.

28. Senior Management should be invariably informed of limit exceptions, and the information process and action required in such cases, must be clearly defined. There has to be distinction between absolute limits and other limits, which may, under certain specific and clearly described circumstances, be exceeded for a short duration.

29. Limits should address the potential impact of changes in the market interest rates on reported earnings and the credit institution's economic value of equity. From an earnings perspective the institution should explore the net income as well as the net interest income to fully assess the contribution of non-interest income to the interest risk exposure. The form of limits for addressing the interest rate effect on the economic value of equity should be commensurate with the size and complexity of the underlying positions.

30. Interest rate risk limits may be keyed to specific scenarios such as increases or decreases of various magnitudes, especially to stress situations also taking into account historic rate volatility and the duration needed for management to address exposure.

STRESS TESTING

31. A credit institution should measure its vulnerability to loss under stressful market conditions, including breakdown of key assumptions, and consider those results when establishing and reviewing the policies and limits for interest rate risk.

32. Stress scenarios would normally include abrupt changes in the:

- ✍ General level of interest rates;
- ✍ Relationships among key market rates (i.e. basis risk);
- ✍ Slope and the shape of the yield curve (i.e. yield curve risk);
- ✍ Volatility of market rates; and
- ✍ Liquidity of key financial markets or conditions under which key business assumptions and parameters break down.

33. Periodical reviews of both the design and the results of such stress tests shall be carried out by management, ensuring that appropriate contingency plans are set-up.

MONITORING AND REPORTING

34. An accurate, informative and a timely management information system in the institution, is deemed by the authority as essential for managing interest rate risk exposure, both to inform management and to support compliance with the policy adopted by the Board of Directors.

35. The Board of Directors should regularly review interest rate risk reports detailing exposure to such a risk. The minimum information included in such reports must be:

- ✍ Summaries of the aggregate exposures;
- ✍ Demonstration of compliance with policies and limits;
- ✍ Stress tests results, including those assessing breakdown in key assumptions and parameters; and
- ✍ Summary findings of review of interest rate risk policies, procedures, and adequacy of the measurement systems, including any findings of the internal and/or external auditors.

INTERNAL CONTROLS AND INDEPENDENT AUDITS

36. A credit institution must have sound internal controls to ensure the integrity of the interest rate risk management. An effective system of internal controls for interest rate risk must include:

- ✍ Strong control environment;
- ✍ An adequate process for identifying and evaluating risk;
- ✍ The setting up of control activities such as policies, procedures and methodologies;

- ✍ Adequate information systems; and
- ✍ Continuous review of adherence to established policies and procedures.

37. The management of a credit institution should evaluate and review the internal controls regularly, to ensure that personnel are following established policies and procedures in meeting the institution's current objectives.

38. The authority is of the opinion that it is essential that reviews and evaluations are carried out by individuals who are independent of the function they are assigned to review.

39. The review of interest rate risk management systems should aim at assessing the assumptions, parameters, and methodologies used, and should seek to understand, test, and document the measurement process, evaluate the system's accuracy, and recommend solutions to identified weaknesses. The review results together with any recommendations, must be reported to Senior Management and/or Board of Directors and acted upon in a timely manner.

40. The authority is of the opinion that the frequency and extent to which a credit institution re-valuates its risk measurement methodologies depends on the complexity of inherent risk exposures. Institutions with complex risk exposures must regularly review their measurement, monitoring and control functions by an independent party, such as internal or external auditors.

41. Where the independent review is carried out by the internal audit, the authority recommends additional periodical reviews by the external auditors.

INTEREST RATE RISK MEASUREMENT TECHNIQUES

42. There are various techniques that are normally used by credit institutions to measure the exposure of earnings and economic value to changes in interest rates. These techniques have the strengths and weaknesses in terms of providing accurate and reasonable measures of interest rate exposure. An ideal measurement system normally takes account of the specific characteristic of each individual interest sensitivity position and captures in detail the full range of potential movements in interest rates.

43. The following constitute brief indicative descriptions[(1)] of the measurement techniques which are normally in use. *Credit institutions are advised to be fully conversant with the relative techniques and to analyse, evaluate and consider in detail all the implications arising out of the technique/s they may choose to adopt.*

1 Refer to source document as defined in paragraph 3.

Repricing Schedules

These are simple techniques for measuring interest rate risk exposure. These techniques include a maturity/repricing schedule that distributes interest-sensitive assets, liabilities and off-balance sheet positions into a certain number of predefined time bands according to their maturity (if fixed rate) or time remaining to their next repricing (if floating rate). Those assets and liabilities lacking definitive repricing intervals (e.g. sight deposits or savings accounts) or actual maturities that may vary from contractual maturities (e.g. mortgages with an option for early repayment) are assigned to repricing time bands according to the credit institution's judgement and past experience.

Gap Analysis

Gap analysis is generated from simple maturity/repricing schedules and provides indicators of the interest sensitivity of both earnings and economic value to changing interest rates. To evaluate earnings exposure, interest rate sensitive liabilities in each time band are subtracted from the corresponding interest rate sensitive assets producing a repricing gap for that particular time band. This can then be multiplied by an assumed change in interest rates to yield an approximation of the change in net interest income that would result from such an interest rate movement.

Duration

A maturity/repricing schedule may also be used to evaluate the effects of changing interest rates on a credit institution's economic value by applying sensitivity weights to each time band. Such weights are usually based on estimates of the duration of the assets and liabilities that fall into each time band. This technique calculates the (%) change in the economic value of a position that would occur given a small change in the level of interest rates. It reflects the timing and size of cash flows that occur before the instrument's contractual maturity. Generally, the longer the maturity or next repricing date of the instrument and the smaller the payments that occur before maturity (e.g. coupon payments), the higher the duration. Higher duration implies that a given change in the level of interest rates will have a larger impact on economic value.

Simulation Approaches

These constitute interest rate risk measurement techniques that are more sophisticated than those based on simple maturity/repricing schedules. These techniques are normally used by credit institutions using complex financial instruments or with complex risk profiles. These simulation techniques typically involve detailed assessments of the potential effects of changes in interest rates on earnings and economic value by simulating the future path of interest rates and their impact on cash flows.

Static Simulations

These simulations only assess the cash flows arising from the credit institution's current on- and off- balance sheet positions. In order to assess the exposure of earnings, simulations estimating the cash flows and resultant earnings streams over a specific period are conducted, based on one or more assumed interest rate scenarios.

Dynamic Simulation

The dynamic simulation approach, builds in more detailed assumptions about the future course of interest rates and the expected changes in a credit institution's business activity over that time. Therefore a simulation may involve assumptions about an institution's strategy for changing administered interest rates (e.g. on savings deposits), about behaviour of the institution's customers (e.g. withdrawals from sight and savings deposits) and/or about the future stream of business (new loans or other transactions) that the institution will encounter.

OTHER ISSUES RELATED TO INTEREST RATE RISK MEASUREMENT TECHNIQUES

44. One of the most difficult tasks when measuring interest rate risk is how to deal with those positions where a behavioural maturity differs from contractual maturity, or where there is no declared contractual maturity. On the asset side of the balance sheet, such positions may include mortgages and mortgage-related securities, which can be subject to prepayment. Borrowers may also have the discretion to prepay their mortgages with little or no penalty, a situation that creates uncertainty about the timing of their cash flows.

45. Apart from minor volatility due to demographic factors and macroeconomic conditions, most of the uncertainty surrounding prepayments arises from the response of borrowers to movements in interest rates. Normally, a decline in interest rates results in increasing level of prepayments, as borrowers refinance their loans at lower yields. In contrast, when interest rates rise unexpectedly, prepayment rates tend to slow, leaving the credit institution with a larger than anticipated volume of mortgages paying below current market rates.

46. On the liabilities side, such positions include non-maturity deposits such as sight deposits and savings deposits, which can often be withdrawn without penalty, at the discretion of the depositor. The treatment of such deposits is further complicated by the fact that the rates received by depositors tend not to move in close correlation with changes in the general level of market interest rates. In fact, credit institutions can and do administer the rates on the accounts with the specific intention of managing the volume of deposits retained.

47. The treatment of positions with embedded options is an issue of special concern in measuring the exposure of both current earnings and economic value to interest rate changes. In addition, the issue arises across the full

spectrum of approaches to interest rate measurement, from simple gap analysis to the most sophisticated simulation techniques.

48. In the maturity/repricing schedule framework, a credit institution may normally make assumptions about the likely timing of payments and withdrawals on these positions and *spread* the balances across time bands accordingly.

49. In the simulation framework, more sophisticated behavioural assumptions can be employed, such as the use of option-adjusted pricing models to better estimate the timing and magnitude of cash flows under different interest rate environments. In addition, the simulations can incorporate the institution's assumptions about the likely future treatment of *administered interest rates on non-maturity deposits*.[(2)]

50. As with other elements of interest rate risk measurement, the quality of the estimates of interest rate risk exposure, depends on the quality of the assumptions about the future cash flows and on the positions with uncertain maturities. Credit institutions can look to the past behaviour of such positions for guidance about these assumptions. For instance, econometric or statistical analysis can be used to analyse the behaviour of an institution's holdings in response to past interest rate movements. Such analysis is particularly useful to assess the likely behaviour of non-maturity deposits, which can be influenced by bank-specific factors such as the nature of its customers and local or regional market conditions.

51. Similarly, credit institutions may use statistical prepayment models (models developed internally or purchased from outside developers) to generate expectations about mortgage-related cash flows.

52. Finally, input from managerial and business units within the institution can have an important influence, since these areas may be aware of planned changes to business or repricing strategies that could affect the behaviour of the future cash flows of positions with uncertain maturities.

CONCLUSION

53. In summary, for an effective function of the management of interest rate risk, credit institutions are to be guided by the following best-practice principles or guidelines:

- ✍ The Board of Directors should approve interest rate risk management strategies and policies and be kept informed of the institution's risk exposures.

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2 This refers to the treatment of those positions where behavioural maturity differs from contractual maturity. For example savings and sight deposits may have contractual maturities or may be open-ended, but in either case, depositors generally have the option to make withdrawals at any time. In addition, credit institutions often choose not to move interest rates paid on these deposits in line with changes in market rate. (Reference: Source document as defined in paragraph 3).

- ✍ Senior Management must ensure effective management of the bank's business structure and level of interest rate risk.

- ✍ Individuals and/or committees responsible for managing interest risk should be clearly identified with adequate separation of duties being put in place.

- ✍ Interest rate risk policies and procedures have to be clearly defined and be consistent with the complexity of activities both on a solo and consolidated basis.

- ✍ Identification of risks inherent in new products and activities with adequate procedures and controls should put in place before new products/activities are introduced/undertaken.

- ✍ All material sources of interest rate risk are to be captured in a risk management system, which should be clearly understood by risk managers and the institution's management.

- ✍ The establishment of limits of exposures should be within the parameters of internal policies.

- ✍ Measurement of vulnerability to loss under stressful market conditions should be undertaken.

- ✍ Adequate information systems for measuring, monitoring, controlling and timely reporting of interest rate exposures to the Board of Directors, Senior Management and other line managers are to be established.

- ✍ Adequate systems of internal controls over the interest rate risk management process should be implemented.

- ✍ Adequate systems of reporting to the authority with sufficient and timely information that would enable the authority to evaluate an institution's level of interest rate risk should be in place at all times.