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Consultation paper on technical aspects of the management of interest rate risk arising from non-trading activities and concentration risk under the supervisory review process - CP 11

Executive Summary

1. CEBS refers in its guidelines on the Application of the Supervisory Review Process under Pillar 2 issued in January 2006 (commonly called 'CP03Rev') to a structured dialogue between supervisors and institutions that should embrace four types of risks (i) Pillar 1 risks, (ii) risks not fully captured under Pillar 1, (iii) risks covered by Pillar 2 and (iv) external factors not already considered in the previous cases¹.
2. In particular, institutions should develop and maintain an ICAAP that identifies risks they are or might be exposed to and allocate adequate financial resources against those risks.
3. This consultation paper sets out technical guidelines applicable to two of those risks: "interest rate risk arising from non-trading activities" (here, "interest rate risk in the banking book" or "IRRBB") and "concentration risk", as a follow-up to CEBS CP03 rev.
4. The document puts the emphasis on high level guidance, some of which is applicable to institutions (both credit institutions and investment firms) and some to supervisors. It is not meant to provide detailed guidance on whether and how quantitative tools and models should be used or developed.
5. For both risks, it sets out general considerations including current international thinking, a definition of what the IRRBB and concentration risk should cover the relevant legal requirements of the CRD, and a summary of current market practices. This, together with the supervisory considerations, explains the context that has led to the guidelines. It is recognized that market practices and supervisory approaches may evolve other time, and therefore there is a need to ensure that such a technical paper is kept under review and, to the extent necessary, adapted to reflect any such developments.
6. The paper then sets out:
 - a. guidance on what the supervisors should expect to see in the ICAAP², under which it is the institution's own responsibility to manage adequately (i.e. identify, measure, monitor and control) these risks and allocate internal capital, where considered necessary, in support

¹ See Chapter 4: the SREP-ICAAP interaction and prudential measures. Dialogue 2. page 34.

² ICAAP stands for Internal Capital Adequacy Assessment Process

of the interest rate risk and concentration risk in a structured manner,

- b. the corresponding guidance to supervisors in conducting the Supervisory Review and Evaluation Process (SREP) in relation to the ICAAP. Supervisors will require institutions to show that their internal capital is commensurate with the level of the interest rate risk in the banking book and the concentration risk. In doing so, and in accordance with CEBS guidelines on the application of the supervisory review process under Pillar 2, the supervisory authorities will adapt their approach to ensure it is proportionate to the nature, scale and complexity of the activities of an institution. Similarly, the depth, frequency and intensity of the supervisory evaluation will be determined by the risks posed to the supervisor's statutory objective of ensuring the soundness of the banking sector
7. As a general remark, CEBS reiterates the need to carry out and seek to coordinate the dialogue between supervisors and institutions in the context of the CEBS guidelines on supervisory cooperation for cross-border banking and investment firm groups.
8. In relation to interest rate risk in the banking book, and specifically the CRD requirement that measures should be taken by supervisory authorities in cases where an institution's economic value declines by more than 20% of own funds as a result of a standard shock, CEBS has proposed a common EU framework for such a standard shock. In doing so, it is recognised that, as part of their dialogue with individual institutions, supervisors may require their institutions to apply routinely shocks of a different order of magnitude, both in amount and time, reflecting the nature, size and complexity of those institutions.
9. Supervisors encourage institutions to develop their own systems and shocks, in accordance with their risk profile and risk management policies.
10. With regard to concentration risk, the consultation paper sets out guidance on the management and mitigation of concentration risk, which should not be considered as a tick-box list of requirements. CEBS draws the attention of market participants that it has subsequently received a technical call for advice from the Commission in the context of the Commission's current review of the large exposures regime. CEBS is aware that the industry is now faced with two related pieces of work from CEBS on concentration risk, one on the guidance with regard to Concentration risk in the context of Pillar 2, and the other on industry practices with regard to the measurement of single-name concentration risk, but also on concentration risk practices more generally. CEBS would nevertheless prefer to run the two in parallel both to meet its timetable to respond to the Commission while progressing its Pillar 2 guidance, though in due course the latter might need to be amended to take into account anything material which emerges from the work on the call for advice from the Commission.

11. The guidance put forward has been informed by early and informal dialogue with a number of experts nominated by the CEBS Consultative Panel.
12. The consultation period is three months and will run until **23 June 2006**. Responses should be sent to CP11@c-eps.org. Comments received will be published on the CEBS website unless respondents request otherwise.
13. CEBS would especially welcome responses to the following questions:

(1) Do you agree with the proposed guidelines?

(2) Do you have further technical comments on the proposals?

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Appendix I: Basel Committee on Banking Supervision- Supporting Document - Principles for the Management and Supervision of Interest Rate Risk, July 2004.

Appendix II : Basel Committee on Banking Supervision-International Convergence of Capital measurement and Capital Standards Annex 4 - An example of a standardised framework- –June 2004.

Appendix III: Basel Committee on Banking Supervision-International Convergence of Capital measurement and Capital Standards, para 770-777 – June 2004.

Part 1: the Interest rate risk in the banking book (IRRBB)

GENERAL CONSIDERATIONS

1. The measurement of interest rate risk in the banking book poses a number of major practical difficulties. Most of these difficulties are dealt with by institutions making certain assumptions which may differ between institutions and which may be modified over time even within one institution. Hence interest rate risk in the banking book is part of Pillar 2 where a tailored approach is possible.
2. Some issues, such as the consequences of IFRS for the reporting and management of interest rate risk, have not been captured in the present document and may merit CEBS' attention at some point in the future.
3. Under the IFRS framework, the fair value option in IAS 39 will allow institutions to fair-value banking book items that are actively managed. Although the effect of the change is still not clear, it is likely that institutions will increase the use of fair value – rather than historical cost – for the measurement of a number of financial assets (including derivatives) held in the banking book, and eventually their liabilities. IFRS additionally asks institutions to perform and disclose a sensitivity analysis for each of the market risks to which they are exposed, including the interest rate risk on financial instruments. The disclosure could take a number of forms such as a maturity-repricing schedule. Financial risk management policies and objectives must also be disclosed. There will clearly be some overlap with the regulatory framework for interest rate risk in the banking book, though the objectives of prudential regulation and IFRS, and some of the definitions used, will not be the same in all cases.

International context

4. Interest rate risk in the banking book forms part of the Basel Committee on Banking Supervision's revised framework on "International Convergence of Capital Measurement and Capital Standards (June 2004) ('the Basel text'). In particular Section III, paragraphs 761-764, which were complemented by a Supporting Document to the Capital Adequacy Framework, deal with interest rate risk (in both the banking and the trading book) ("Principles for the Management and Supervision of Interest Rate Risk", July 2004). These documents have been used as a sound basis for this paper. Guidance on qualitative aspects of the management and measurement of risks has been set out in the CEBS guidelines on the application of the supervisory review process under Pillar 2, (Chapter 2.1. Guidelines on Internal Governance). These guidelines apply naturally to the IRRBB risk. Overall, it has been ensured that this paper is consistent with current international thinking.

Definition

5. For the purpose of this paper, interest rate risk is taken to be the current or prospective risk to both the earnings and capital of institutions arising from adverse movements in interest rates. In the context of Pillar 2, this is in respect of the banking book only, given that interest rate risk in the trading book is already covered under the Pillar 1 market risk regulations. This risk

may be attributable to repricing mismatches of assets and liabilities and off-balance sheet long and short positions, as well as so-called basis risk³ and the linear and non-linear risk inherent in (embedded) options.

6. Consideration of interest rate risk from the perspectives of both earnings and economic value is important. Volatility of earnings is an important focal point for interest rate analysis because significantly reduced earnings can pose a threat to capital adequacy. Measurement of the impact on economic value provides a more comprehensive view of the potential long-term effects on an institution's overall exposures. In this context, economic value, as it relates to the institution's solvency, should be one of the main variables monitored by institutions under their ICAAP on interest rate risk.

Legal Basis

7. In the CRD, interest rate risk in the non-trading book is treated under the ICAAP/SREP framework.⁴ Similar to other Pillar 2 risks, the CRD requires that:
 - an institution shall implement systems to evaluate and manage the risk arising from potential changes in interest rates as they affect a credit institution's non-trading activities (Annex V. para. 10)⁵,
 - based on the evaluation of those risks, an institution is also required to hold internal capital against these risks, if it considers internal capital to be the appropriate buffer (Article 123), and
 - competent authorities have to review risk management processes and capital adequacy (Article 124).
8. In contrast to other Pillar 2 risks however, Article 124(5) places on the supervisor the specific obligation to take action in cases where the economic value of an institution declines by more than 20% of own funds as a result of applying a supervisory standard shock to its interest rate risk in the non-trading book.

Current market practices

(i) Identification of IRRBB

9. There are numerous ways that financial institutions currently identify and measure IRRBB. Their methods reflect the specific form of the risk in question and the nature, scale and complexity of their activities. IRRBB encompasses:
 - risks related to the mismatch of repricing of assets and liabilities and off balance sheet short and long term positions,

³ Also known as 'structural risk'. This is the risk incurred when an institution borrows money at a rate which reprices under different conditions to the rate at which it lends money.

⁴ references are made to the ECOFIN 299- 12890/05 Version .

⁵ Article 22 deals with governance arrangements. Annex V sets out technical criteria on organisation and treatment of risks under the heading "Interest rate risk arising from non-trading activities".

- risks arising from hedging exposure to one interest rate with exposure to a rate which reprices under slightly different conditions,
- risk related to the uncertainties of occurrence of transactions e.g. when expected future transactions do not equal the actual transactions, and
- risks arising from consumers redeeming fixed rate products when market rates change.

(ii) Monitoring and management of IRRBB

10. A wide range of tools may be used by institutions to measure and monitor IRRBB. Institutions are usually using:

- systems which track the progress of transactions, based on which institutions estimate the likely take-up rate,
- gap analysis showing the assets and liabilities at the different repricing dates, and the sensitivity of the present value of these buckets to different scenarios in interest rates, and
- simulation techniques using scenarios that calculate the impact of changes in market conditions, e.g. the different repricing instruments, simulation of interest rate paths, customer behaviours etc.

11. Furthermore, stress testing can also be performed, in order to measure financial institutions' vulnerability under stressed market conditions like abrupt changes in the level and scope of the term structure of interest rates, changes in the relationships among key market rates, etc.

12. When using gap analysis and/or simulation techniques, institutions measure the IRRBB under straightforward shifts of the term structure of interest rate (parallel shifts and yield curve twists).

13. Based on these various tools, institutions use different types of hedges to mitigate the risks, or limits - both positional and in terms of the profit and loss account, such as stop-loss- and set aside capital buffers.

14. The management body sets out the IRRBB policy. In large or more complex institutions, the function of measuring, monitoring and controlling IRRBB is usually called "Asset and Liability Management" (ALM). It is usually assigned to an independent risk control unit. Some institutions also have a committee with powers delegated by the board, usually called "Asset and Liability Committee (ALCO)", responsible for major interest rate risk hedging and new asset and liability decisions.

15. Supervisors recognise that there are various levels of centralisation of ALM within institutions, e.g. in cross border groups some may have a centralised management and assessment function for IRRBB while others do not.

(iii) Variables monitored in the IRRBB process

16.As already mentioned above, institutions usually consider two different, but complementary, perspectives in their process of assessing IRRBB.

17.The earnings perspective focuses on the sensitivity of earnings in the short-term (over the next one or two years) to interest rate movements. Institutions usually adopt this perspective due to two main reasons: (i) this is the variable through which an interest rate change has an immediate impact on reported earnings; and (ii) the assessment of interest rate risk from an economic perspective is difficult because it is mainly based on assumptions about the behaviour of long-term instruments, such as stable demand deposits and those with prepayment options.

18.The economic value perspective focuses on the sensitivity to interest rate changes of the market values of all interest rate bearing instruments. The changes in market values may in turn have an impact on net worth. For instance, negative changes in the market values of all interest rate instruments give an indication of the potential deterioration on future net interest income.

Supervisory considerations

19.A number of considerations arise from the above:

- as it has not been standard practice to require additional own funds (regulatory capital) for interest rate risk in the banking book, supervisors will need to develop their approaches to the appropriate use of this prudential measure,
- incentives must be in place, as appropriate, for the development and application of advanced models and techniques,
- the level playing field should be disturbed as little as possible in terms of maintaining a consistent and fair approach,
- the administrative burden should not be excessive,
- the supervisory policy on interest rate risk and any information obtained under that policy should be complementary to aggregate financial stability analyses across institutions, and
- because the non-trading books of investment firms are usually (relatively) small, the main application of this policy is likely to be on credit institutions. Moreover, consideration should be given to proportionality, for instance, by considering the absolute or relative size of the non-trading activities, in a way similar to the Pillar 1 market risk regulation for interest rate risk in the trading book.

20.There are arguments both for and against standardised reporting of interest rate risk in the banking book, as well as for and against the possible middle ground of standardised reporting applied to less complex institutions and non-standardised reporting applied to complex institutions. This paper expresses no preferences in this respect.

21. Nonetheless, institutions should at least be able to compute and report the effects of the standard shock on economic value, as described in IRRBB 5 and 6. They should also be able to report the effect of instantaneous or gradual interest rate changes on earnings over a relevant time period, as requested by national supervisors. Moreover, they should be able to report the amount of internal capital set aside for interest rate risk in the banking book.
22. Whichever approach to reporting is employed, supervisors should collect sufficient information about internal methodologies and underlying assumptions of institutions (e.g. yield curves used, internal measurement of positions without contractual maturity, treatment of optionality etc) for them to evaluate the reported information and to make their own assessment of the adequacy of the results of interest rate risk measurement.
23. Off-site supervision can take place on the basis of institutions' internal reports and/or following some standardised, supervisory format. Supervisors can also undertake on-site inspections.

GUIDANCE FOR INSTITUTIONS

IRRBB1

Institutions are required to show supervisors that their internal capital is commensurate with the level of the interest rate risk in the banking book. In that respect, institutions should be able to calculate the:

- **potential changes in their economic value⁶ resulting from changes in the level of interest rates.** Institutions are free to develop and use their own methodologies, albeit that supervisors may also require institutions to apply an additional standardised methodology. An example of such a methodology is provided by the standardised framework of Annex 4 of the supporting Basel document "Principles for the management and supervision of interest rate risk"- See Annex II, and
- **the overall interest rate risk in the banking book** at various levels of consolidation, sub-consolidation and solo entity if required to do so by supervisors.

IRRBB 2

Institutions must be able to compute and report to their supervisory authority the change in their economic value as a result of applying a standard shock prescribed by the authority (see IRRBB 5 below).

If as a result of this standard shock an institution's economic value were to decline by more than 20% of own funds it should be prepared to discuss

⁶ Irrespective of the accounting impact

with the supervisory authority measures which might need to be taken to mitigate such a potential decline.

IRRBB 3

Besides the standard shock, larger and/or more complex institutions should measure their exposure, if material, and sensitivity, to changes in the shape of the yield curve, changes between different market rates (i.e. basis risk) and changes to assumptions, for example those about customer behaviour.

Institutions should also consider whether a purely static analysis of the impact on their current portfolio of a given shock or shocks should be supplemented by a more dynamic simulation approach. Larger and/or more complex institutions should also take into account scenarios where different interest rate paths are computed and where some of the assumptions (e.g. about behaviour, contribution to risk and balance sheet size and composition) are themselves functions of interest rate levels.

IRRBB 4

Institutions should have a well reasoned, robust and documented policy to address all issues that are important to their individual circumstances.

Without prejudice to the principle of proportionality, this includes, where applicable, the following technical issues:

- The internal definition and boundary between "banking book" / "trading activities".
- The definition of economic value and its consistency with the method used to value assets and liabilities (e.g. discounted cashflows).
- The size and the form of the different shocks to be used for internal calculations.
- The use of a dynamic and / or static approach in the application of interest rate shocks.
- The treatment of commonly called "pipeline transactions" (including any related hedging).
- The aggregation of multicurrency interest rate exposures.
- The inclusion (or not) of non-interest bearing assets and liabilities (including capital and reserves)
- The treatment of current and savings accounts (i.e. the maturity attached to exposures without a contractual maturity).

- The treatment of fixed rate assets (liabilities) where customers still have a right to repay (withdraw) early.
- The extent to which sensitivities to small shocks can be scaled up linearly without material loss of accuracy (i.e. covering both convexity generally and the non-linearity of pay-off associated with explicit option products).
- The degree of granularity employed (e.g. offsets within a time bucket)
- Whether all future cash flows or only principal balances are included.

GUIDANCE FOR SUPERVISORS

IRRBB 5

Supervisory authorities will set a comparable standard shock as referred to in the CRD and applicable to the non-trading book of all their relevant institutions. Supervisors may decide to set different standard shocks for different currencies. The following guidelines will be put in place:

- A standard shock could, for example, be set so that it will be broadly equivalent to the 1st and 99th percentile of observed interest rate changes (five years of observed one day movements scaled up to a 240 day year), This would currently equate approximately to a parallel 200 basis points shock for major currencies - as suggested by the Basel Committee (See Annex II below).
- National supervisors will be expected to use this as their starting point when considering at what level to set the shock, but they will also need to take into account factors such as the general level of interest rates and any relevant national characteristics in their financial systems
- National supervisors will periodically review the size of the shocks in the light of changing circumstances, in particular the general level of interest rates (for instance periods of very low interest rates) and their volatility. Institutions' internal systems should therefore be flexible enough to compute their sensitivity to any standardised shock that is prescribed. Supervisors will not, however, make frequent or minor amendments for the purpose of spurious statistical accuracy.
- If the required shock (e.g. a 200 basis point shock) would imply negative interest rates or if such a shock would otherwise be considered inappropriate, the national supervisor will adjust the requirements accordingly, and

- Where an institution is a subsidiary of an institution which is authorised in another EU member state, the respective supervisors will, in accordance with the CEBS guidelines on supervisory cooperation for cross-border banking and investment firm groups, seek to coordinate their approaches on the standard shocks to be applied

IRRBB 6

The supervisory review should encompass both the qualitative and organisational aspects of interest rate risk management, an evaluation of the institution's quantification of interest rate risk and an assessment of the adequacy of the relationship between interest rate risk and internal capital.

This approach will be tailored to an institution's specific risk profile, drawing on the Basel Supporting Document "Principles for the Management and Supervision of Interest Rate Risk"-See Annex I below-.

IRRBB 7

The scope of application of the supervisors' assessment of interest rate risk is that used for the Supervisory Review Process(SRP)⁷.

Where necessary, for instance where there are obstacles to cash movements among subsidiaries or separate management processes among subsidiaries, supervisors will have the discretion to apply assessments at the level of individual entities.

IRRBB 8

Supervisors will need to know and understand the internal method used for calculating the economic value, and if requested the amount of earnings, exposed to interest rate risk in the banking book, including underlying assumptions (e.g. yield curves used, treatment of optionality).

This will include allowing for in-depth analysis and assessments by institutions (including their assumptions underlying the issues raised in IRRBB 4 above), which could form the basis for peer group analysis and/or (model) benchmarking, and offer the supervisor a handle for discussions with the institution. Institutions may be requested to calculate the effects of specific, ad hoc interest rate scenarios.

IRRBB 9

Prompt prudential measures, including both qualitative and quantitative elements tailored to an institution's specific circumstances, may be required from either the overall

⁷ The Scope of application of the SRP is set out on page 9 of the CEBS guidelines on the Application of the Supervisory review Process under Pillar 2 – January 2006

supervisory assessment or in response to an institution reporting that its economic value may decline by more than 20% of own funds as a result of applying the supervisory standard shock.

The measures can include a range of possible supervisory measures which are not limited to:

- improvement of risk management arrangements,
- variations to internal limits,
- reduction of the risk profile, and
- increase in the quantity of required own funds (regulatory capital) - if an additional own funds requirement for interest rate risk arising from non-trading activities is imposed, it will be additional to the own funds requirement for other risks.

The measure(s) used in response to the application of the standard shock will depend, inter alia, on the complexity of the calculation method used and the appropriateness of the standard shock.

If the reduction in economic value is determined by a relatively straightforward or standard method of calculation, the initial supervisory reaction might be to request additional, possibly internal, information. If, however, the reduction is based on the outcome of a more complex model about which the supervisors have greater information, they might reach an assessment of the appropriate measure(s) more quickly.

In the latter case, the choice of the measure can take into account elements such as:

- the absolute and relative size of the exposure,
- the effects of other shifts or twists in the yield curve (other than the standardised),
- the treatment of multi-currency aggregation,
- the treatment of optionality and behavioural maturity, for example of current and savings accounts,
- the expected impact on earnings and the timing thereof,
- the quality of risk management, the internal systems and methodologies and the internal control system,
- the market segments in which the institution is active,
- the link with other risk exposures of the institution, for example credit risk,

- peer group comparison (and benchmarking where the methodologies are similar),
- the composition of the institution's own funds, and
- the relationship between the quantity of the institution's internal capital and regulatory own funds and the quantity of its actual surplus of regulatory own funds.

Part 2: Concentration risk

GENERAL CONSIDERATIONS

24. Concentration risk is one of the most important cause of major institutions losses, which may become large enough to jeopardise an institution's on-going operation.
25. Concentration risk is viewed in terms of both traditional on balance sheet exposures and those embodied in a range of financial instruments and off-balance sheet exposures (e.g. credit default swaps etc.). As such, concentration risk may arise in both the banking and trading books, with the latter arising in terms of counterparty risk and significant exposure to particular instrument types or instruments whose value is driven by the same common factors. Concentration risk is understood as being intimately related to credit risk, which is analysed and measured as part of the broader credit risk management process, but can also arise in any risk type.
26. Although it is important for all institutions to monitor and control concentration risk both across portfolios and on a consolidated basis, its relative importance will vary. For example, it will be relatively less important from a capital adequacy perspective for large internationally active institutions with well diversified portfolios, as Pillar 1 has already been calibrated on the basis of such institutions. On the other hand, it will be relatively more important for institutions with less diversified portfolios - either because they are geographically concentrated or are specialised lenders in particular sectors - to consider the extent to which their business is concentrated and the consequent role of capital in relation to comparative advantages such as expertise and local knowledge. In this respect, it is important to recognise that specialised institutions should not necessarily be assumed to be more risky in comparison with larger institutions doing the same business.
27. The obverse to concentration is diversification, so it is important to understand the potential of correlation analysis to measure both concentration and diversification. An insufficiently granular analysis or analysis that does not explore to a sufficient degree the common factors, and their correlation, affecting exposures will not adequately capture or measure concentration risk.
28. The proportionality principle⁸ should be considered.

International context

29. Concentration risk is set out in Articles 770-777 of the Basel text of June 2004 (See Appendix III below). It has been ensured that the guidelines below are consistent with current international thinking as set out in the Basel text.

Definition

⁸ See Considerations in CEBS Guidelines on the Application of the Supervisory Review Process under Pillar 2 page 9 (25 January 2006)

30. For the purpose of this paper, concentration risk is any single (direct and/or indirect) exposure or group of exposures with the potential to produce losses large enough to threaten an institutions health or an ability to maintain its core business.

31. Concentration risk has two main elements:

- single name concentration which arises from large (possibly connected) individual exposures - the definition of connected for these purposes needs to be sufficiently broad to capture exposures which are connected through, for example, common ownership/management/ guarantors. This kind of concentration may be broadly covered, in particular in institutions which use quantitative modeling techniques, via granularity adjustments in the context of Pillar 2 measures, and
- 'sector' concentration which arises from significant exposures to groups of counterparts whose likelihood of default is driven by common underlying factors, for example:
 - economic sector
 - geographical location
 - currency
 - credit risk mitigation measures (including, for example, risks associated with large indirect credit exposures e.g. to a single collateral issuer).

Legal Basis

32. Under the CRD, concentration risk is addressed in particular as follows:

Annex V - Technical criteria on organisation and treatment of risks.

Para. 7 The concentration risk arising from exposures to counterparties, groups of connected counterparties, and counterparties in the same economic sector, geographic region or from the same activity or commodity, the application of credit risk mitigation techniques, including in particular risks associated with large indirect credit exposures (e.g. to a single collateral issuer) shall be addressed and controlled by means of written policies and procedures.

33. Such requirements fall under the more general provisions of Article 123 for institutions to have sound, effective and complete strategies and processes to assess and maintain on an ongoing basis the amounts, types and distribution of internal capital that they consider adequate to cover the nature and level of the risks to which they are or might be exposed; and for these strategies and processes to be subject to regular internal review to ensure that they remain comprehensive and proportionate to the nature, scale and complexity of the activities of the credit institution concerned.

34. In addition to the specific provisions on concentration risk included in the CRD, institutions will continue to be subject to the rules on monitoring and control of large exposures provided for in Articles 106 to 118 of the CRD.

Current Market Practices

(i) Identification and measurement of concentration risk

35. There are numerous ways that financial institutions currently identify and measure concentration risk. Such methods reflect both the specific form of the risk in question, and the nature, scale and complexity of institution involved, and are typically a product of the approach being taken to credit risk measurement and management by the individual institution.

(i) Single/connected counterparties/exposure types are readily measured in terms of simple metrics that reflect the size discrepancies embodied in concentration risk. Individual counterparty metrics, such as notional exposure or a combination of notional exposure and LGD relative to a balance sheet total can be calculated. In addition, a range of portfolio indicators e.g. rankings of the largest exposures, diversity scores⁹ or concentration curves¹⁰ can also be calculated

(ii) Common or correlated underlying factors. A more sophisticated portfolio based approach is sometimes adopted where common risk factors have been analysed, whereby correlations in probability of default can be identified. Taking a portfolio view, concentration reflects an interaction between individual exposures and correlation. The data available when more sophisticated credit risk modeling is undertaken should allow the assessment of correlations and the calculation of diversification effects.

36. Measurement of concentration risk is therefore a part of an institution's overall approach to credit risk management, and the approach adopted will usually reflect the nature, scale and complexity of the institution in question. Examples of measurement techniques are outlined as below:

- Size of top 'x' large exposures relative to relevant numeraire (e.g. balance sheet/own funds/net profit numeraire);
- Size of top 'x' connected exposures relative to relevant numeraire;

⁹ Diversity Scores are analogous to the Herfindahl-Hirschmann index (HHI) used in market structure analysis. The HHI is calculated from the sum of the squares of the percentages of the shares of the exposures. The value of the HHI must lie between 0 and 10,000, with larger values indicating higher concentration. It measures the extent to which a small number of sectors/countries/counterparties account for a large proportion of exposure. HHI is related to exposure concentration or, if appropriately modified, to expected losses.

¹⁰ A concentration curve provides a means of assessing for instance whether a certain risk is more concentrated in some countries/sectors than in others.

- Size of key sectoral/geographical concentrations relative to relevant numeraire;
- Portfolio concentration ratios/Diversity scores/Gini coefficients¹¹ based on exposures or loss given default;
- Portfolio correlations and variance/ covariance measures.

(ii) Mitigation of concentration risk

37. Institutions manage concentration risk through applying the range of tools, both quantitative (e.g. limit structures) and qualitative (e.g. management actions such as reporting and escalation procedures), that are used for balance sheet management more broadly. These include but are not limited to, combinations of:

- **Limits:** comprehensive credit limit systems which identify large individual exposures/connected counterparties; and reflect ongoing portfolio monitoring and risk appetite in terms of concentration risk. The Large Exposures requirements of the CRD may be a useful starting point but may not, in themselves, be sufficient for institutions in defining their own internal limits. Most institutions set sector, country and product line limits. Some capture and monitor correlated exposures, both on and off balance sheet, and set limits accordingly.
- **Portfolio management:** monitoring of risk concentrations through active portfolio management enables institutions to adjust their new business acquisition to correct for undue concentrations which have arisen, or may arise.
- **Risk mitigation:** using a systematic approach to transferring credit risk to another party, either directly by selling down the assets or as part of structured securitisation transactions or by buying protection from other parties (examples include credit derivatives, collateral, guarantees, sub-participation, assignment etc).
- **Capital buffers:** it is common for institutions to hold additional capital buffers above their required minimum regulatory capital, making an additional general rather than specific capital allocation for concentration risk in the portfolio.

(iii) Stress testing

38. Stress testing is an important tool for the assessment and management of concentration risk. During periods of economic calm, concentrations in an institution's portfolio are unlikely to have any noticeable adverse effects on performance or credit quality as usually measured and, as such, can remain latent. However, the real threat arises in an adverse economic scenario, where

¹¹ Gini coefficient can be used to measure any form of uneven distribution. It is a number between 0 and 1, where 0 corresponds with complete risk homogeneity (where every exposure has the same risk) and 1 corresponds with absolute concentration (where one exposure carries all the risks, and the other exposures have zero risks).

connected or correlated exposures all show increased risk of default or actually default at the same time. Stress testing may reveal previously undetected linkages between different elements of an institution's portfolio. In this context, well designed, comprehensive and regular stress tests of institutions' portfolios serve as a useful tool in managing concentration risk.

GUIDANCE FOR INSTITUTIONS

Concentration 1

All institutions should have clear policies and procedures approved by the management body¹² in relation to exposure to concentration risk

Institutions should have a clear and transparent concentration risk policy, as part of the broader credit risk process, which is clearly and properly documented and approved by the management body. It should be subject to regular review to take account of changes in risk appetite and the business environment.

When devising their policies and procedures and when carrying out their review, institutions should apply the CEBS guidelines on internal governance¹³.

Concentration 2

Institutions should have appropriate internal systems or methods to identify and measure concentration risk which are suitable to the nature, scale and complexity of their business.

Institutions should have internal systems that identify, measure and monitor concentration risk by the following categories:

- individual large exposures to a single counterparty, connected counterparties and related clusters - the definition of connected for these purposes needs to be sufficiently broad to capture exposures which are connected through, for example, common ownership/management/guarantors/syndication techniques,
- exposures to counterparties in the same economic sector or geographic region, and
- CRM techniques, collateral type or single protection seller.

Larger and/or more complex institutions should also be able to identify common or correlated risk factors that reflect more subtle or situation-specific factors that require more sophisticated analysis for measurement and control. These concentrations may reflect correlations in underlying

¹² As referred to in Article 11 of the Capital Requirements Directive

¹³ See CEBS guidelines on the Application of the supervisory review process under Pillar 2, Chapter 2.1

risk factors or exposure to common factors that are embedded in financial structures and may only emerge in stress situations (see below).

Concentration 3

Institutions should apply appropriate limit structures for concentration risk in relation to their overall risk appetite and/or profile.

Institutions should establish and comply with a set of limits for credit risk management. Procedures should be in place for the utilisation of limits ensuring that the degree of credit risk stipulated by the management body is not exceeded.

Institutions should carry out analyses of the credit portfolio, including estimates of its trends, and should take account of the results of these analyses in setting and verifying the objectivity of the procedures and limits for credit risk management.

Limits should be subject to independent checks.

Institutions should have procedures in place which adequately address cases where the limits are exceeded.

Limits could be expressed as:

- Size of top x large exposures relative to relevant numeraire (e.g. balance sheet/own funds/net profit numeraire);
- Size of top x connected exposures relative to relevant numeraire;
- Size of key sectoral/geographical concentrations relative to relevant numeraire;
- Portfolio Concentration Ratios/Diversity Scores/Gini Curves based on exposures or loss given default;
- Portfolio correlations and variance covariance measures.

Concentration 4

Institutions should have adequate arrangements in place for actively monitoring, managing and mitigating concentration risk against agreed policies and limits.

Monitoring should be incorporated into the institution's usual risk management and reporting systems and be undertaken sufficiently frequently to reflect the nature of the business(es) and at a sufficiently senior level within the institution.

Given that concentration risk, by its nature, tends to relate to aggregation of risk it is essential that appropriate oversight is exercised by the management body ultimately at a strategic level.

Management responses to any concerns which might arise from such monitoring could include:

- proceeding to a more detailed review of the risk environment in the particular sector(s),
- applying additional stress tests and scenario analyses,
- reviewing with greater intensity the economic performance of existing borrowers,
- reviewing approval levels for new business, and
- regularly reviewing risk mitigation techniques, their value and their legal enforceability.

Resultant mitigation may include one or more of the following:

- reducing limits on risk concentrations,
- adjusting new business acquisition to address undue concentrations, .
- transferring credit risk to other parties, buying protection from other parties (examples include credit derivatives, collateral, guarantees, sub-participation, assignment etc) or selling down either directly or as part of securitization transactions, and
- allocating additional internal capital (see Concentration 5 below).

Concentration 5

Institutions should assess the amount of internal capital which they consider to be adequate to hold against the level of concentration risk in their portfolio.

Institutions should undertake this assessment as part of their ICAAP. In doing so, they will need to take into account a range of relevant factors, including the quality of their risk management and other internal systems and controls, ability to take effective management action to adjust levels of concentration risk and the implications of stress-testing and scenario analysis. While the role of capital therefore needs to be assessed within this broader context, and keeping in mind that the weight attached to the different factors will vary from institution to institution, the expectation is that the higher the levels of concentration, the greater the onus will be on institutions to demonstrate how they have assessed the implications in terms of internal capital.

GUIDANCE TO SUPERVISORS

Concentration 6

Supervisors will collect sufficient information from institutions on which to base their assessment

This information should come from a variety of sources, both on-site and off-site.

Off-site supervision (i.e. desk analysis) allows supervisors to draw on a combination of institutions' own internal reports, standardised supervisory and statistical returns (e.g. as used for reporting individual large exposures and sectoral analysis) and specifically designed questionnaires for thematic purposes.

On-site supervision enables supervisors to (i) make first-hand assessments of the quality of an institution's policies and procedures and how effectively the institution manages and controls concentration risk, including management of risk mitigation techniques, and (ii) verify as necessary the accuracy of reported data. Supervisors will usually have quantitative and qualitative methods for conducting such on-site assessments.

This information will assist supervisors to assess individual institutions in relation to their peers

Concentration 7

The scope of application of the supervisors' assessment of concentration risk is that used for the Supervisory Review Process (SRP)¹⁴.

Where necessary, supervisors will also have the discretion to apply an assessment at the level of individual entities.

Concentration 8

Supervisors will use quantitative indicators within their Risk Assessment Systems to assess degrees of concentration risk.

Supervisors can build up these indicators based on the set of limits defined internally by institutions (see Concentration 3). They may also develop their own models and tools such as indicators based on the existing regular reporting from institutions, including the reporting of large exposures or geographical/sectoral risks.

These indicators may be used within the supervisor's risk assessment systems to carry out peer comparisons and identify outliers.

Such quantitative indicators may include the following (non-exhaustive list):

- Size of top x large (connected) exposures relative to regulatory capital

¹⁴ The Scope of application of the SRP is set out on page 9 of the CEBS guidelines on the Application of the Supervisory review Process under Pillar 2 – January 2006

- Size of key sectoral/geographical concentrations relative to regulatory capital
- Portfolio Concentration ratios/Diversity scores/Gini curves based on exposures or loss given default
- Portfolio correlations and variance covariance measures

Concentration 8

The supervisory review should encompass both the qualitative and organisational aspects of concentration risk management.

Supervisors recognise that the assessment and management of concentration risk does not only rely on quantitative modelling techniques but also on qualitative factors e.g. the expertise of people with regard to the identification of the sectors at risk. Indeed, the sectoral approach adopted by institutions for their credit risk management may not rely on standardised national definitions which were designed for statistical purposes.

Concentration 9

Supervisors can draw on stress tests performed by institutions to assess the impact of specific economic scenarios on concentrated portfolios

Supervisors will use the results of stress testing to assess the full extent to which adverse economic conditions impact on highly connected or correlated exposures.

Concentration 10

Supervisors will pay particular attention to those institutions which are highly concentrated by customer type or specialized nature of product.

In doing so, supervisors note that such institutions should not necessarily be assumed to be more risky in comparison with larger and/or more complex institutions doing the same business given the possible existence of comparative advantages such as expertise and local knowledge. At the same time, however, it will be relatively more important in such circumstances for supervisors to consider whether such institutions have adequately assessed the role of capital in conjunction with other relevant factors such as expertise and local knowledge.

Basel Supporting Document on Interest Rate Risk

The 15 principles given in the Basel Supporting Document - Principles for the Management and Supervision of Interest Rate Risk, July 2004, are listed below.

Board and senior management oversight of interest rate risk

Principle 1: In order to carry out its responsibilities, the board of directors in a bank should approve strategies and policies with respect to interest rate risk management and ensure that senior management takes the steps necessary to monitor and control these risks consistent with the approved strategies and policies. The board of directors should be informed regularly of the interest rate risk exposure of the bank in order to assess the monitoring and controlling of such risk against the board's guidance on the levels of risk that are acceptable to the bank.

Principle 2: Senior management must ensure that the structure of the bank's business and the level of interest rate risk it assumes are effectively managed, that appropriate policies and procedures are established to control and limit these risks, and that resources are available for evaluating and controlling interest rate risk.

Principle 3: Banks should clearly define the individuals and/or committees responsible for managing interest rate risk and should ensure that there is adequate separation of duties in key elements of the risk management process to avoid potential conflicts of interest. Banks should have risk measurement, monitoring and control functions with clearly defined duties that are sufficiently independent from position-taking functions of the bank and which report risk exposures directly to senior management and the board of directors. Larger or more complex banks should have a designated independent unit responsible for the design and administration of the bank's interest rate risk measurement, monitoring, and control functions.

Adequate risk management policies and procedures

Principle 4: It is essential that banks' interest rate risk policies and procedures are clearly defined and consistent with the nature and complexity of their activities. These policies should be applied on a consolidated basis and, as appropriate, at the level of individual affiliates, especially when recognizing legal distinctions and possible obstacles to cash movements among affiliates.

Principle 5: It is important that banks identify the risks inherent in new products and activities and ensure these are subject to adequate procedures and controls before being introduced or undertaken. Major hedging or risk management initiatives should be approved in advance by the board or its appropriate delegated committee.

Risk measurement, monitoring, and control functions

Principle 6: It is essential that banks have interest rate risk measurement systems that capture all material sources of interest rate risk and that assess

the effect of interest rate changes in ways that are consistent with the scope of their activities. The assumptions underlying the system should be clearly understood by risk managers and bank management.

Principle 7: Banks must establish and enforce operating limits and other practices that maintain exposures within levels consistent with their internal policies.

Principle 8: Banks should measure their vulnerability to loss under stressful market conditions - including the breakdown of key assumptions - and consider those results when establishing and reviewing their policies and limits for interest rate risk.

Principle 9: Banks must have adequate information systems for measuring, monitoring, controlling and reporting interest rate exposures. Reports must be provided on a timely basis to the bank's board of directors, senior management and, where appropriate, individual business line managers.

Internal controls

Principle 10: Banks must have an adequate system of internal controls over their interest rate risk management process. A fundamental component of the internal control system involves regular independent reviews and evaluations of the effectiveness of the system and, where necessary, ensuring that appropriate revisions or enhancements to internal controls are made. The results of such reviews should be available to the relevant supervisory authorities.

Information for supervisory authorities

Principle 11: Supervisory authorities should obtain from banks sufficient and timely information with which to evaluate their level of interest rate risk. This information should take appropriate account of the range of maturities and currencies in each bank's portfolio, including off-balance sheet items, as well as other relevant factors, such as the distinction between trading and non-trading activities.

Capital adequacy

Principle 12: Banks must hold capital commensurate with the level of interest rate risk they undertake.

Disclosure of interest rate risk

Principle 13: Banks should release to the public information on the level of interest rate risk and their policies for its management.

Supervisory treatment of interest rate risk in the banking book

Principle 14: Supervisory authorities must assess whether the internal measurement systems of banks adequately capture the interest rate risk in their banking book. If a bank's internal measurement system does not adequately capture the interest rate risk, banks must bring the system to the

required standard. To facilitate supervisors' monitoring of interest rate risk exposures across institutions, banks must provide the results of their internal measurement systems, expressed in terms of the threat to economic value, using a standardized interest rate shock.

Principle 15: If supervisors determine that a bank is not holding capital commensurate with the level of interest rate risk in the banking book, they should consider remedial action, requiring the bank either to reduce its risk, to hold a specific additional amount of capital, or a combination of both.

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Annex 4 - An example of a standardised framework

1. This annex contains an example setting out the methodology and calculation process in one version of a standardised framework. Other methodologies and calculation processes could be equally applicable in this context, depending on the circumstances of the bank concerned. Such a framework is intended for supervisory reporting purposes only, and is not intended to represent an adequate framework for internal risk management purposes.

A. Methodology

2. Positions on the bank's balance sheet would be slotted into the maturity approach according to the following principles:

(a) All assets and liabilities belonging to the banking book and all OBS items belonging to the banking book which are sensitive to changes in interest rates (including all interest rate derivatives) are slotted into a maturity ladder comprising a number of time bands large enough to capture the nature of interest rate risk in a national banking market. Annex 2 discusses issues relating to the selection of appropriate time bands. Separate maturity ladders are to be used for each currency accounting for more than 5% of either banking book assets or liabilities.

(b) On-balance-sheet items are treated at book value.

(c) Fixed-rate instruments are allocated according to the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date.

(d) Exposures which create practical processing problems because of their large number and relatively small individual amount (e.g. instalment or mortgage loans) may be allocated on the basis of statistically supported assessment methods.

(e) Core deposits are slotted according to an assumed maturity of no longer than five years.

(f) National supervisors will provide guidance on how other items with a behavioural maturity or repricing that differ from contractual maturity or repricing are to be slotted into the time band structure.

(g) Derivatives are converted into positions in the relevant underlying. The amounts considered are the principal amount of the underlying or of the notional underlying.

(h) Futures and forward contracts, including forward rate agreements (FRA), are treated as a combination of a long and a short position. The maturity of a future or a FRA will be the period until delivery or exercise of the contract, plus - where applicable - the life of the underlying instrument. For example, a long position in a June three month interest rate future (taken in April) is to be reported as a long position with a maturity of five months and a short position with a maturity of two months.

(i) Swaps are treated as two notional positions with relevant maturities. For example, an interest rate swap under which a bank is receiving floating-rate interest and paying fixed-rate interest will be treated as a long floating-rate position of maturity equivalent to the period until the next interest fixing and a short fixed-rate position of maturity equivalent to the residual life of the swap. The separate legs of cross currency swaps are to be treated in the relevant maturity ladders for the currencies concerned.

(j) Options are considered according to the delta equivalent amount of the underlying or of the notional underlying.

B. Calculation process

3. The calculation process consists of five steps.

(a) The first step is to offset the longs and shorts in each time band, resulting in a single short or long position in each time band.

(b) The second step is to weight these resulting short and long positions by a factor that is designed to reflect the sensitivity of the positions in the different time bands to an assumed change in interest rates. The set of weighting factors for each time band is set out in Table 1 below. These factors are based on an assumed parallel shift of 200 basis points throughout the time spectrum, and on a proxy of modified duration of positions situated at the middle of each time band and yielding 5%.

(c) The third step is to sum these resulting weighted positions, offsetting longs and shorts, leading to the net short- or long-weighted position of the banking book in the given currency.

(d) The fourth step is to calculate the weighted position of the whole banking book by summing the net short- and long-weighted positions calculated for different currencies.

(e) The fifth step is to relate the weighted position of the whole banking book to capital.

Table 1 is provided in the Basel document itself

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Credit concentration risk

770. A risk concentration is any single exposure or group of exposures with the potential to produce losses large enough (relative to a bank's capital, total assets, or overall risk level) to threaten a bank's health or ability to maintain its core operations. Risk concentrations are arguably the single most important cause of major problems in banks.

771. Risk concentrations can arise in a bank's assets, liabilities, or off-balance sheet items, through the execution or processing of transactions (either product or service), or through a combination of exposures across these broad categories. Because lending is the primary activity of most banks, credit risk concentrations are often the most material risk concentrations within a bank.

772. Credit risk concentrations, by their nature, are based on common or correlated risk factors, which, in times of stress, have an adverse effect on the creditworthiness of each of the individual counterparties making up the concentration. Such concentrations are not addressed in the Pillar 1 capital charge for credit risk.

773. Banks should have in place effective internal policies, systems and controls to identify, measure, monitor, and control their credit risk concentrations. Banks should explicitly consider the extent of their credit risk concentrations in their assessment of capital adequacy under Pillar 2. These policies should cover the different forms of credit risk concentrations to which a bank may be exposed. Such concentrations include:

Significant exposures to an individual counterparty or group of related counterparties. In many jurisdictions, supervisors define a limit for exposures of this nature, commonly referred to as a large exposure limit. Banks might also establish an aggregate limit for the management and control of all of its large exposures as a group;

Credit exposures to counterparties in the same economic sector or geographic region;

Credit exposures to counterparties whose financial performance is dependent on the same activity or commodity; and

Indirect credit exposures arising from a bank's CRM activities (e.g. exposure to a single collateral type or to credit protection provided by a single counterparty).

774. A bank's framework for managing credit risk concentrations should be clearly documented and should include a definition of the credit risk concentrations relevant to the bank and how these concentrations and their corresponding limits are calculated. Limits should be defined in relation to a bank's capital, total assets or, where adequate measures exist, its overall risk level.

775. A bank's management should conduct periodic stress tests of its major credit risk concentrations and review the results of those tests to identify and respond to potential changes in market conditions that could adversely impact the bank's performance.

776. A bank should ensure that, in respect of credit risk concentrations, it complies with the Committee document *Principles for the Management of Credit Risk* (September 2000) and the more detailed guidance in the Appendix to that paper.

777. In the course of their activities, supervisors should assess the extent of a bank's credit risk concentrations, how they are managed, and the extent to which the bank considers them in its internal assessment of capital adequacy under Pillar 2. Such assessments should include reviews of the results of a bank's stress tests. Supervisors should take appropriate actions where the risks arising from a bank's credit risk concentrations are not adequately addressed by the bank.