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Final Report

Guidelines on the management of interest rate risk arising from
non-trading activities

Contents

1. Executive Summary	3
2. Background and rationale	5
2.1 Background	5
2.2 Context and practical considerations	7
2.3 Background to the detailed guidelines	10
2.4 Glossary of technical terms used in the guidelines	18
3. EBA Guidelines	19
Section 1 - Compliance and reporting obligations	19
Section 2 - Subject matter, scope and definitions	20
Section 3 - Implementation	21
Section 4 – Management of IRRBB	21
1. High-level Guidelines	21
2. Detailed Guidelines	25
Annex A - IRRBB Measurement Methods	37
Annex B - Sophistication Matrix for IRRBB measurement	42
4. Accompanying documents	45
4.1 Overview of questions for consultation	45
4.2 Views of the Banking Stakeholder Group (BSG)	47
4.3 Feedback on the public consultation	47
4.4 Cost-benefit analysis / impact assessment	74

1. Executive Summary

The European Banking Authority (EBA) has updated the CEBS guidelines on ‘Technical aspects of the management of interest rate risk arising from non-trading activities under the supervisory review process’ (hereinafter ‘original guidelines’), published on 3 October 2006, which are hereby repealed. The guidance provided in these updated guidelines was drawn up by the EBA and applies to one of the Pillar 2 risks specified in Article 98(5) of Directive 2013/36/EU - the “interest rate risk arising from non-trading activities” (hereinafter, “interest rate risk in the banking book” or “IRRBB”). Addressed to competent authorities, they focus on expectations for the appropriate identification and mitigation by institutions of IRRBB risks. Separate EBA guidelines for common procedures and methodologies for the supervisory review and evaluation process (SREP) include guidance for competent authorities on assessing IRRBB in the SREP¹. The EBA guidelines on stress testing (GL 32) also provide some guidance that is relevant to IRRBB². For the avoidance of doubt, all interest rate risk arising from trading activities is outside the scope of these updated IRRBB guidelines.

The updated guidelines introduce changes to the ‘high-level guidelines’ (the ‘Principles’ in the original Guidelines, numbered as IRRBB 1 to 9) in order to clarify expectations, to extend the high-level guidelines to internal governance, and to specify the calculation of the supervisory ‘standard shock’ that should be performed in accordance with Article 98(5) of Directive 2013/36/EU³. They also provide more detailed guidance on certain aspects of managing IRRBB⁴.

The guidelines are structured into two major parts:

High-level guidelines for the management of IRRBB - an updated version of the original Guidelines text providing enhanced high level guidelines on the management of IRRBB (Section 4 – 1)

Detailed guidelines for the management of IRRBB⁵ - which further specify the high level Guidelines (section 4 – 2). The detailed guidelines are split into 5 parts covering different topics under the following headings:

- Scenarios and Stress Testing

¹<http://www.eba.europa.eu/documents/10180/935249/EBA-GL-2014-13+28Guidelines+on+SREP+methodologies+and+processes%29.pdf> . Title 6.5 of these guidelines on the SREP covers IRRBB: this guidance to competent authorities was originally included in the draft IRRBB guidelines that were consulted on in Consultation Paper EBA/CP/2013/23 dated 27.06.2013, but has been moved to the SREP guidelines to avoid duplication and improve clarity.

² https://www.eba.europa.eu/documents/10180/16094/ST_Guidelines.pdf

³ See IRRBB 5

⁴ Original principles IRRBB 6 – IRRBB 9 have been removed from the updated guidelines as they were addresses to competent authorities – and are therefore now covered by the SREP guidelines.

⁵ The Consultation Paper referred to these as “Technical guidelines”, but the terminology has been changed to “Detailed guidelines” as not all aspects are technical.

- Measurement assumptions
- Methods for measuring interest rate risk (also covered in two Annexes)
- The governance of interest rate risk
- The identification, calculation and allocation of capital to interest rate risk.

The guidelines are preceded by a background section that explains the rationale for the updated guidelines, together with an explanation of the context for the detailed guidance and some key practical considerations. The Background section concludes with a short glossary of key terms used in this document.

The EBA recognises that market practices may change over time, and that it is therefore necessary to ensure that these guidelines are reviewed on an ongoing basis, to the extent necessary, updated to reflect any such developments. In particular, the EBA acknowledges that the Basel Committee on Banking Supervision is reviewing its own guidelines on interest rate risk, and particularly on capital requirements for this risk. If changes to the framework result in an update to relevant EU legislation, the EBA will consult on amending these guidelines.

Next steps

The guidelines will be translated into the official EU languages and published on the EBA website. The deadline for competent authorities to report whether they comply with the guidelines will be two months after the publication of the translations. The guidelines will apply from 1 January 2016.

2. Background and rationale

2.1 Background

These guidelines introduce both amendments and additions to the original guidelines of 3 October 2006 entitled ‘Technical aspects of the management of interest rate risk arising from non-trading activities under the supervisory review process. The risks covered by the original guidelines are commonly referred to as ‘interest rate risk in the banking book’ (hereinafter ‘IRRBB’). The original guidelines were produced by the Committee of European Banking Supervisors (CEBS), whose tasks have been taken over the EBA. The work on revising of the original guidelines started under CEBS and completed after transition to the EBA.

The handling of IRRBB is currently subject to further international work, and consequently implementation of these guidelines does not preclude further updates at a later stage.

Addressed to competent authorities, the Guidelines contain High-level guidelines and detailed guidelines on the appropriate identification and mitigation of IRRBB risks to viability and sustainability by institutions (both credit institutions and investment firms)⁶. The annexes contain information on international guidance relating to IRRBB and detailed guidance on aspects of IRRBB. Responsibility for identifying, measuring, monitoring and controlling IRRBB rests with institutions, and competent authorities will therefore expect institutions develop their own systems and stress tests which are commensurate with their risk profiles and risk management policies. The EBA considers IRRBB to be a significant risk type that affects all credit institutions, and believes that it should be managed prudently and appropriately. The level of sophistication of the management approach should be proportionate to the scale and complexity of the business model, and should take account of the actual level of IRRBB.

In relation to non-trading activities, Article 98(5) of Directive 2013/36/EU stipulates that “measures” shall be required by competent authorities at least in the case of institutions whose economic value declines by more than 20% of own funds as a result of a sudden and unexpected change in interest rates of 200 basis points – or such other shock as the EBA may define. These guidelines confirm that the “standard shock” for the purposes of Article 98(5) will be set at a minimum of 200 basis points, but kept under review in the light of changes to the economic environment and to changes in market interest rates levels. The guidelines also provide further guidance on the calculation of the outcome of the “standard shock” to achieve improved consistency (see IRRBB 5).

One possible consequence of implementing the changes to the 2006 guidelines is an increased focus on the risk to reward dynamics of certain types of banking activity (e.g. lending at long term fixed rates), which could in turn lead to a change in market volumes or product availability.

⁶ The principles and guidance addressed to supervisors, in the original guidelines of 2006 and in the 2013 consultation paper of these guidelines, have been moved to the EBA guidelines for common procedures and methodologies for SREP to avoid having supervisory guidance on IRRBB in two separate documents.

The revisions to the original guidelines are intended to:

- a) update and improve the 'High-level guidelines' (the Principles of the original guidelines addressed to institutions and numbered as IRRBB 1 to 5);
- b) provide additional 'detailed guidance' for institutions on various aspects of the management and the assessment of IRRBB (which expands upon the 'High-level guidelines').

The amendments to the original High-level guidelines (IRRBB 1 to IRRBB 5 and associated text) focus on three areas:

- a) a general re-wording of the original Principles to improve the clarity and consistency of the High-level guidelines, and to remove areas of overlap;
- b) the insertion of an additional high level guideline for institutions on the need for robust internal governance arrangements for IRRBB (numbered as IRRBB 4.1); and
- c) specific clarification of the guidance on calculation of the supervisory standard shock, in terms both of the size of the shock and the suggested calculation method (revised IRRBB 5).

The additional detailed guidance is intended to highlight key technical aspects of the main IRRBB risks that should be considered, and to provide an overview of how managers of institutions should take these aspects into account in assessing IRRBB in their Internal Capital Adequacy Assessment Process (ICAAP). This detailed guidance focuses thematically on five areas of interest risk assessment/control:

- a) the setting and use of scenarios for stress testing purposes;
- b) measurement assumptions;
- c) methods of measuring interest rate risk;
- d) the governance of interest rate risk;
- e) the identification, calculation and allocation of capital to IRRBB.

The detailed technical guidance cross-references to the relevant High-level guideline.

2.2 Context and practical considerations

General Background

The measurement of IRRBB presents a number of major practical difficulties, including difficulty in determining an appropriate economic value for banking book assets and liabilities, as well as modelling the value of future cash flows. Institutions deal with most of these difficulties by making certain assumptions, which may differ between institutions and which may be modified over time even within a single institution. It is for this reason that IRRBB is part of Pillar 2, where a tailored approach is possible.

However, competent authorities need to be able to compare the results of some tests performed in a consistent manner. The ‘outlier’ test specified in Article 98(5) of Directive 2013/36/EU, and detailed in IRRBB 5 is intended to allow supervisors to perform this type of comparison, and to facilitate this, the original wording of IRRBB 5 has been extended to include guidance on the calculation method, choice of yield curve, and handling of behavioural assumptions for non-maturity deposits and own equity.

Another major consideration in managing IRRBB is the impact of accounting standards. The EBA is not responsible for the operation of accounting standards, but the impact of applying these standards is a legitimate concern. The detailed guidelines on “The governance of interest rate risk” in section 4, 2.4 specify that institutions should be aware of the effects of accounting policies, but they should not let the handling of accounting drive their risk management approach. Managing business risks should be a priority, and the effects of accounting should be managed as a secondary impact. (For example, an institution should not allow the availability or otherwise of hedge accounting to determine whether it should purchase an interest rate swap to hedge interest rate risks arising from lending at fixed interest rates when funding at variable rates.)

International context

IRRBB 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). Appendix 4 of the Basel text gives an example of a standardised measurement framework, and this is referred to in the EBA’s guidance on calculating the “standard shock”.

In Directive 2013/36/EU, interest rate risk in the non-trading book is treated under the ICAAP/SREP framework. Similar to other Pillar 2 risks, the Directive requires that:

- a) 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 (Article 84)⁷; and
- b) an institution shall have in place sound, effective and comprehensive strategies and processes to assess and maintain on an on-going 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 (Article 73).

Institutions should be aware that, unlike other Pillar 2 risks, Article 98(5) specifically requires the supervisor the specific obligation to take measures if the economic value of an institution declines by more than 20% of their own funds as a result of a sudden and unexpected change in interest rates of 200 basis points (supervisory standard shock) to its interest rate risk in the non-trading book.

Proportionality

The principle of proportionality, as specified in the provisions of the Directive 2013/36/EU relating to Pillar 2, and underlined in Title 2.4. of the EBA guidelines for common procedures and methodologies for the supervisory review and evaluation process (SREP guidelines)⁸ also applies to IRRBB identification, measurement, monitoring and control. The complexity and intensity of this activity should therefore depend on the size of the institutions as well as to the sophistication and diversification of the institution's activities.

Scope of Application

For these guidelines, interest rate risk is defined as the current or prospective risk to both the capital and earnings of institutions arising from adverse movements in underlying interest rates. Risks of this type can also arise from changes in the perceived credit quality of individual instruments, which may result in fluctuations in spreads relative to underlying interest rates (credit spread risk): such risks are not specifically covered in these guidelines, although the risk is referred to where particularly relevant.

In the context of Pillar 2, interest risk is considered with respect to the banking book only, given that interest rate risk in the trading book is already covered under the Pillar 1 market risk regulations. It is important that interest rate risk is considered from the perspectives of both economic value and earnings. Measuring the impact on economic value (i.e. the change in the present value of the bank's expected net cash flows) provides a view of the potential long-term effects on an institution's overall exposures. Volatility of earnings is also an important focal point for interest rate analysis because significantly reduced earnings can pose a threat to future capital adequacy. In assessing the implementation of these guidelines by institutions, competent authorities will therefore take into account both economic value and earnings effects when assessing IRRBB, being mindful of the economic value focus of Article 98(5) as detailed in the "standard shock" outlier test.

⁷ Article 76 deals with governance arrangements.

⁸ EBA guidelines on SREP title 2.4, Proportionality and Supervisory Engagement

The EBA's additional detailed guidance covers measurement methods for both economic value and earnings effects of IRRBB.

2.3 Background to the detailed guidelines

The detailed guidelines in Section 4, 2 of the guidelines supplement the high level Guidelines with technical aspects of the management of interest rate risk arising from non-trading activities.

Additional guidance for institutions is provided on various aspects of the management / assessment of interest rate risk in the banking book ('IRRBB'). The EBA recognises that the measurement and control of interest rate risk may involve a trade-off between different risk types and objectives. However, the detailed guidance is intended to highlight the main risks to be considered, and to provide an overview of the key issues that managers of institutions should take into account in assessing IRRBB under the ICAAP. As in the case of the high-level guidelines, this detailed guidance refers to, but does not specifically address risks arising from fluctuations in credit spreads relative to underlying interest rates. As with the High-level guidelines, the Proportionality principle applies.

The detailed guidelines focus thematically on five areas of interest rate risk assessment/control:

Scenarios and stress testing

The interest rate scenario chosen may have material implications for the level of risk calculated under different IRRBB measurement systems which are set out in Section 4, 2.3 of the guidelines. Whilst most institutions and competent authorities review the outcome of standard shocks based on sudden parallel shifts of the yield curve, these stress results may not always pick up risk positions at specific points on the curve, and may assume offsets that would not occur under slightly different scenarios. Both institutions and competent authorities therefore need to be confident that the scenarios used for ongoing internal measurement and stress testing purposes are adequate to identify all material interest rate risks.

Depending on local market rates and circumstances, some of the scenarios suggested for stress testing may also be relevant for ongoing internal management. The guidance on the scenario and methodology used in computing the outcome of the 'standard shock' is defined for supervisory purposes only, and is not intended to supplant institutions' own assumptions and calculation methodologies used for internal risk management purposes.

Additional guidance on stress testing for interest rate risk arising from non-trading activities can be found in Annex 6 of the guidelines on stress testing (GL 32): (https://www.eba.europa.eu/documents/10180/16094/ST_Guidelines.pdf).

Measurement assumptions

One of the challenges in the measuring IRRBB is the identification and the incorporation of products or positions where the assumed behavioural repricing date differs significantly from the contractual repricing date, or where there is no stated contractual repricing date.

In assessing exposure to interest rate risk, institutions necessarily have to make numerous assumptions in order to be able to design appropriate measurement systems for both economic

value and earnings at risk (EaR). These assumptions are critical to the outcome of any risk assessment.

Broadly, the key assumptions can be categorised into three types:

- Behavioural assumptions for accounts with **embedded customer optionality** (e.g. loans with prepayment features, deposits with notice terms, revolving credit arrangements and lending commitments that may or may not get drawn);
- Behavioural assumptions for customer **accounts without specific repricing dates**, particularly those with no (or a very low) interest rate attached (e.g. current accounts and variable-rate savings accounts that contribute significantly to the net interest margin) (often called “non-maturity deposits”); and
- Corporate planning assumptions for the **investment term of own equity capital** (non-interest bearing capital resources) where stabilisation of the income derived from assets effectively funded by equity is judged by the institution to be a key objective.

The assumptions made in all these cases can have a material impact on the economic value and/or on EaR sensitivity of the institution to changes in interest rates. It is therefore very important to identify the risks that might arise should the assumptions prove incorrect or unjustified are identified.

Some products contain **customer exercisable embedded options** that affect their interest rate repricing characteristics. Examples, for loans, would include:

- prepayment options (e.g. discretion given to borrowers to repay their mortgages before the contractual end date); or
- options to extend duration (e.g. extending the repayment term of loans); or
- options to change interest rate characteristics (e.g. transition from fixed rate to variable rate, or vice versa).

Embedded optionality creates uncertainty about the timing of the cash flows associated with these products and necessitates further estimation and/or modelling effort by the institution to understand and manage the interest rate risk.

Certain types of assets are more complicated to model for behavioural purposes, and institutions therefore need to pay special attention to their specific characteristics

For example:

- **Credit card portfolios** (including charge cards requiring full repayment on a monthly basis) may need to be separated into their constituent components (repayment types, introductory offers, interest bearing, non-interest bearing, and transaction balances). Sub-product analysis will often be required to understand how environmental and competitive factors may affect balances and product rates on these portfolios under different stress scenarios.
- **Overdrafts** tend to have no specified maturity date or repayment profile other than being repayable on demand. To understand the interest rate risk of overdrafts and similar

revolving credit products, institutions will need to make assumptions about how they will be funded and priced. IRR from these portfolios will change over time in response to competitor and environmental factors, so the modelling needs to be capable of reflecting this dynamically.

- **Pipeline exposures** (e.g. where a loan has been agreed and the customer can choose whether to draw down or not) effectively provide the customer with an option that will most likely be exercised when market conditions least suit the institution (negative convexity). Management of pipeline exposures relies on accurate data on applications received, and modelling of expected drawdowns.

For certain items such as **current accounts and certain variable rate savings accounts** the contractual maturity structure and/or an interest rate reprice date may not be representative of the actual outcomes expected in the event of changes to market rates. For such products, where interest is paid at all, the rate may be significantly below wholesale market levels and, although the institution usually has the contractual right to reprice the product at short notice, in reality the rate may behave as though fixed and the balances may exhibit a longer maturity profile than indicated by the strict contractual position. The limited scope to reduce already low rates (which are effectively floored at or above 0%) on balances held in such accounts may result in the interest margin earnings of the institution being significantly sensitive to any rapid reduction in the interest rate earned on the assets funded by these balances.

Institutions may therefore seek to mitigate the margin compression risk in a reducing interest rate environment, where earnings generated by assets funded from these low cost liabilities would decrease, by estimating the likely behavioural repricing and maturity profile of these liabilities and locking in a margin return by creating a portfolio of assets (possibly including derivatives) that matches the expected behaviour of the liabilities. For example, by creating a replicating asset portfolio to represent the low cost liabilities, the interest rate on that portfolio could effectively be set to earn the moving average of interest rates corresponding to the repricing behavioural assumption for the liabilities. So, if the behavioural assumption is that balances would reprice over five years, every month the portfolio would need to be extended back to five years as the first month of the series matures, and the rate earned on the portfolio would be the average of the five year rate for the previous 60 months. Therefore, if market rates were to fall, the moving average rate would also fall, but much more slowly, and vice versa should market rates rise.

In order to estimate the expected repricing rate of such balances, and therefore the period over which margin hedging should operate, institutions will need to assess how fast such low-cost balances might decay and have to be replaced with funding that is subject to a higher interest rate. These assumptions should be sensitive to potential changes in the behaviour of their customers in response to changes in the economic environment or arising from changes in the institution's own particular strategies, or those of its key competitors. Clearly, the downside of locking in a margin under a scenario of falling rates is that the institution will be less able to benefit from the additional margin potentially available under a rising rates scenario. The impact of this trade-off can be identified by measuring the economic value risk arising from the approach adopted to earnings stabilisation.

In using an assumed maturity profile for the purposes of interest rate risk management, an institution assumes a modelling risk. The longer the assumed run-off profile, the larger is the potential margin of error caused by using potentially incorrect assumptions. Therefore, although an institution may be able to demonstrate to itself that the balances will remain (at substantially unchanged rates) for a very long period, it will nonetheless wish to ensure that the benefits of locking in returns to match the expected repricing profile outweigh the risks that the balances may decay/reprice more quickly than anticipated, potentially resulting in the locked-in return on assets being less than the repriced cost of funding them.

The behavioural assumptions for interest rate risk management purposes may differ substantially from those developed for liquidity risk purposes. For instance, an Institution's assumption may be (for liquidity purposes) that certain deposits have a long behavioural maturity, but this does not mean that the interest rate to be paid on those deposits will remain unchanged for that same period.

In measuring and managing their exposures to interest rate risk, some institutions may seek to stabilise the **earnings on assets financed by equity capital**. To achieve this, they may decide either to designate a 'capital portfolio' of assets (possibly including derivatives such as receiver swaps) to be managed for return/duration; or they may ascribe a specific maturity profile to equity capital to be used in overall IRR measurement systems. Applying a defined investment term to equity to mitigate EaR is a relatively common ALM practice amongst institutions, and these guidelines neither discourage nor encourage such activity. However, approaches to hedging earnings on equity capital are subject to local supervisory guidance and may not be permitted in some EU Member States. Where it is permitted, the key issues are the prudence of the assumptions made, and whether an appropriate balance is being struck between earnings stabilisation and economic value risk arising.

In determining what constitutes the quantum of equity capital to be subject to planning assumptions, institutions will need to take account of the expected movement in balances (e.g. of specific reserves such as those providing for the payment of dividends and/or restructuring including acquisitions, disposals etc.)

As with behavioural assumptions for current or non-maturity customer accounts, the longer the assumed investment period for equity capital during which income is stabilised, the greater the risk that assumptions prove to be incorrect. If extreme interest rate occur, the income of the institution could be stabilised, but at far lower levels than would have been available had repricing been possible earlier (e.g. if the stabilised rate were 3% against market spot rates of 12%).

Theoretically, if no stabilization of earnings on capital is undertaken and all repricing gaps (> 3 months) in the balance sheet are matched, the capital will effectively be financing very short-term assets and the interest return on capital will fluctuate with short-term market rates earned on those assets. If repricing gaps are not matched, the earnings on capital will reflect the extent and timing of those interest rate gaps.

The viewpoints of institutions and competent authorities with respect to IRRBB may differ, given their different outlook and responsibilities. Behavioural adjustments, such as those for customer accounts without specific repricing dates and/or equity capital can make a very significant difference

to the quantum of economic value calculated to be at risk. The specification of the 'standard shock', which is required for comparability purposes, will result in economic value risk being ascribed to positions that have been taken by the institution to stabilise earnings. These guidelines are not intended to prescribe the measure of IRRBB to be used by institutions – it could be imprudent for institutions to rely on the supervisory calculation only in measuring their IRRBB.

Methods for measuring interest rate risk

This part provides additional guidance on measurement techniques and supervisory expectations for these techniques. The part is organised into sub-parts:

- A description of the technical aspects of the quantitative tools and models with emphasis on their advantages and limitations (Table 1 in Annex A) and the different interest rate risk types they potentially capture (Table 2); and
- A matrix depicting different sophistication levels for each quantitative tool is included in Annex B (Table 3 in Annex B). From this matrix an appropriate combination of measures together with an appropriate sophistication level per instrument can be selected for individual institutions to reflect business scale and complexity. By selecting the measures with appropriate sophistication levels the principle of proportionality will be applied.

a) Tools for measuring different components of interest rate risk (Table 1)

Table 1 in Annex A provides an overview of the quantitative tools that are currently most commonly used to measure the interest rate risk, but does not cover all the quantitative methods that may be available. The table shows the advantages and limitations of each measure, and is intended to aid institutions in designing an appropriate quantitative tool set for measuring their IRRBB; and to aid competent authorities in evaluating such a tool set. Each institution is expected to design its own quantitative tool set by selecting a range of quantitative tools and measures, so that all aspects of the IRRBB are adequately captured. The table does not provide an exhaustive list of measures and tools, and institutions are encouraged to design their own quantitative tools and measures, or to use modified/enhanced versions of the listed tools, to adequately capture their particular IRRBB.

In Table 1, the quantitative tools and models are divided into groups of earnings and economic value measures and further into groups of static and dynamic models. For each quantitative tool, the table states which interest rate risk components it potentially measures. The four components of IRRBB as defined in these guidelines are: repricing risk, yield curve risk, basis risk and option risk. Whether a quantitative tool captures a certain interest rate risk component is dependent on the stress scenario that is used in the particular model.

One group of measures relating to IRRBB not covered in the table below are measures of the income effect resulting from accounting treatment of transactions in the banking book. If the accounting treatment for these transactions poses a material risk, institutions should develop measures to adequately capture this risk.

b) Economic value measures versus earnings measures

Earnings measures capture the short-term effect of the interest rate changes on the earnings of an institution and therefore, indirectly through profitability, a short-term solvency effect. These tools are especially suitable for measuring the effect on near-term earnings of changes in interest rates that potentially have a strong effect in the short term such as significant steepening or flattening of the yield curve caused by changes in short-term rates.

Economic value measures capture the long-term effect of the interest rate changes. These measures capture the full effects of interest rate changes, which is a key aspect in choosing a business strategy and keeping an adequate level of capitalisation in the long term. However, these measures may provide insufficient information on a possible inadequate capitalisation in the short run, when extreme temporary shocks could cause large losses.

Interest rate risk has two forms - economic value volatility and earnings volatility. The measurement of both of these forms is complementary in understanding the complete scope of IRRBB. This is due to the fact that an interest rate transaction cannot stabilise both earnings and economic value at the same time. The longer the duration of a transaction, the stronger the stabilising effect on earnings, but the greater the impact on economic value under stress. A bank choosing to ascribe a behavioural interest rate risk profile to equity capital should make its decision based on the trade-off between earnings volatility and economic value volatility and should therefore monitor both metrics. The balance between stabilising earnings and stabilising economic value will be different for each institution, and will depend on the balance sheet composition and business model of each institution. Each institution may therefore have a different strategy for managing IRRBB and may focus more or less management resources on either economic value measures or on earnings measures.

c) Static and dynamic models

Static models measure the effects of interest rate changes on a portfolio without adjusting the assumptions in the models and composition of the banking book. Dynamic models measure the effects of interest rate changes by adjusting some of the assumptions concerning the cash flows and customer behaviour in the event of interest rate changes, and/or incorporating assumptions about the future size and composition of the banking book over time (by incorporating estimates of changes to business flows under different interest rate environments).

The Governance of Interest Rate Risk

The guidance clarifies various elements of internal governance specific to IRRBB. It is closely related to and should be read together with the EBA's guidelines on Internal Governance (GL 44) dated 27 September 2011⁹.

⁹[http://www.eba.europa.eu/documents/10180/103861/EBA-BS-2011-116-final-EBA-Guidelines-on-Internal-Governance-\(2\)_1.pdf](http://www.eba.europa.eu/documents/10180/103861/EBA-BS-2011-116-final-EBA-Guidelines-on-Internal-Governance-(2)_1.pdf)

As specified in GL 44 principles numbered 5 and 9, the management body bears the ultimate responsibility for the risks undertaken by an institution. With regard to IRRBB, this includes:

- the ability to assess (estimate) whether IRRBB is a material risk in the institution;
- understanding the fundamentals of the measurement/assessment of IRRBB as applied in the institution;
- understanding the strengths and weaknesses of the institution's IRRBB management system;
- awareness that hedging with interest rate derivatives is a potentially complex activity that can have unintended consequences, including compounding losses, if used incorrectly; and
- the ability and specific IRRBB-related knowledge to cooperate effectively with competent authorities in the ICAAP-SREP dialogue.

The general requirements for risk policies and processes are detailed in GL 44, especially in Chapter III, Title II.

Capital Identification, Calculation and Allocation

Institutions and competent authorities recognise that the mitigation and management of interest rate risk is a complex activity which can involve exercising judgment in balancing risks to economic value and the risks to future earnings that arise from mismatches in the tenor and interest rate characteristics of assets and liabilities re-pricing at future periods.

Each institution will have its own view on the relative importance of mitigating the impact of interest rate changes on economic value at risk and/or future EaR. For retail banks, the latter measure may be more important, whilst wholesale/investment banks may focus more on the former. However, the management of each institution needs to consider both risks in the context of the longer-term strategy for its business, and the expectations/concerns of its customers, owners and the markets in which it operates. This means, that

- where an institution considers its key assessment and calculation of interest rate risk to be based on the impact on future net interest income, it should nonetheless also consider the economic value at risk in its balance sheet position; and
- where the key assessment and calculation of interest rate risk is deemed by the institution to be the economic value at risk, the consequences for future period net interest income should also be taken into account.

The expectation of governing bodies of institutions (and of their competent authorities) should be that IRRBB, together with other material risks to the business, should be properly managed and residual risks mitigated by holding sufficient capital against them. In assessing the level of unmitigated risk, the relevant exposure level should take account of the allocated limit or limits, rather than just the point-in time risk position, since IRRBB positions can change (or be changed)

significantly in a very short period of time and risk measurement will normally be undertaken less frequently than in a trading book. Given that risk limits are essentially an expression of an institution's risk appetite, and that any capital allocations for IRRBB under Pillar 2 may be adjusted infrequently (e.g. during an annual review of the institution's ICAAP), these capital allocations may need to be based on limits rather than actual positions unless they can be set dynamically and updated daily in the manner of Pillar 1 capital requirements. Where limits are the applicable measure, the expectation would be that they should not be vary repeatedly within a short time-period, and should instead beset strategically in line with risk policies.

2.4 Glossary of technical terms used in the guidelines

<u>Term</u>	<u>Definition</u>
Basis Risk	Arises from hedging exposure to one interest rate with exposure to a rate that reprices under different conditions
Behavioural Repricing	The repricing schedule used by the institution for savings, deposits and current accounts, based on the behaviour of customers; the schedule will be derived from historic observations, modelling and the assumptions that are made about future customer behaviour
Earnings at risk (EaR)	The short-term sensitivity of earnings to interest rate movements
Economic value of Equity (EVE)	For purposes of measuring interest rate risk, the <i>change</i> in the discounted present value of the bank's expected future net cash flows (not the absolute value) without spread, focussing on the sensitivity of the economic values of the banking book items to interest rate changes
Equity capital	The capital that comprises non-interest bearing capital
Interest rate risk in the banking book (IRRBB)	The current or prospective risk to both the earnings and capital of institutions, in respect of the banking book only, arising from adverse movements in interest rates
Internal capital	The capital that the institution assigns to risk types to cover the nature and level of the risks to which it might be exposed
Market value of equity	The sum of the present value of discounted future net cash flows, including spread, which is used for theoretical quantification of the market value of the bank
Non-maturity deposits	Retail current or deposit accounts paying either no interest or low interest based on rates that can be varied at the absolute discretion of the institution, and where depositors may adjust or withdraw their balances at a short notice or without notice. Although contractually these balances have a short maturity, their behavioural maturity can be modelled as significantly longer and the level of balances can be shown to be relatively insensitive to interest rate changes.
Option risk	Arises from options, including embedded options, e.g. consumers redeeming fixed rate products when market rates change
Own funds	The financial resources of an institution as defined in point (118) of Article 4(1) of Regulation (EU) No 575/2013.
Repricing risk	Related to the timing mismatch in the maturity and repricing of assets and liabilities and off-balance sheet short and long-term positions
Credit spread risk	Risk arising from variations in the 'premium' that the market requires for different types of instrument, reflecting both credit and other market risks (e.g. liquidity). This is a separate risk type, but closely associated with IRRBB
Standard shock	The prescribed shock to be applied to the institution's portfolio to determine the impact on the economic value of the institution (also called the 'outlier test')
Yield curve risk	Arises from changes in the slope and the shape of the yield curve

3. EBA Guidelines

On the management of interest rate risk arising from non-trading activities

Section 1 - Compliance and reporting obligations

Status of these guidelines

1. This document contains guidelines issued pursuant to Article 16 of Regulation (EU) No 1093/2010¹⁰. In accordance with Article 16(3) of Regulation (EU) No 1093/2010, competent authorities and financial institutions must make every effort to comply with the guidelines.
2. Guidelines outline the EBA view of appropriate supervisory practices within the European System of Financial Supervision or of how European Union law should be applied in a particular area. Competent authorities as defined in Article 4(2) of Regulation (EU) No 1093/2010 to whom guidelines apply should comply by incorporating them into their practices as appropriate (e.g. by amending their legal framework or their supervisory processes), including where guidelines are directed primarily at institutions.

Reporting requirements

3. According to Article 16(3) of Regulation (EU) No 1093/2010, competent authorities must notify the EBA as to whether they comply or intend to comply with these guidelines, or otherwise with reasons for non-compliance, by (dd.mm.yyyy). In the absence of any notification by this deadline, competent authorities will be considered by the EBA to be non-compliant. Notifications should be sent by submitting the form available on the EBA website to compliance@eba.europa.eu with the reference 'EBA/GL/2015/08'. Notifications should be submitted by persons with appropriate authority to report compliance on behalf of their competent authorities. Any change in the status of compliance must also be reported to EBA.

¹⁰ Regulation (EU) No 1093/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Banking Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/78/EC, (OJ L 331, 15.12.2010, p.12).

4. Notifications will be published on the EBA website, in line with Article 16(3).

Section 2 - Subject matter, scope and definitions

Subject matter

5. These guidelines:
 - (a) specify the identification, management and mitigation of IRRBB;
 - (b) provide the definition of the change in interest rates as referred to in Article 98(5) of Directive 2013/36/EU and methods for the calculation of the outcome of the supervisory standard shock.

Scope of application

6. The level of application of these guidelines should be consistent with the level of application of supervisory review and evaluation process. These guidelines cover measurement methods for both economic value and earnings effects of IRRBB.
7. These guidelines do not apply to risks arising from changes in the perceived credit quality of individual instruments, which may result in fluctuations in spreads relative to underlying interest rates (credit spread risk).

Addressees

8. These guidelines are addressed to competent authorities as defined in point (i) of Article 4(2) of Regulation (EU) No 1093/2010 and to financial institutions as defined in Article 4(1) of Regulation (EU) No 1093/2010.

Definitions

9. Unless otherwise specified, terms used and defined in Directive 2013/36/EU and in Regulation (EU) No 575/2013 have the same meaning in the guidelines.
10. In addition, for the purposes of these guidelines, IRRBB includes, in particular:
 - (a) risks related to the timing mismatch in the maturity and repricing of assets and liabilities and off-balance sheet short and long-term positions (repricing risk);

- (b) risks arising from changes in the slope and the shape of the yield curve (yield curve risk);
- (c) risks arising from hedging exposure to one interest rate with exposure to a rate that reprices under slightly different conditions (basis risk); and
- (d) risks arising from options, including embedded options, e.g. consumers redeeming fixed-rate products when market rates change (option risk).

Section 3 - Implementation

Date of application

11. These guidelines apply from 1 January 2016.

Repeal

12. The CEBS guidelines on technical aspects of the management of interest rate risk arising from non-trading activities under the supervisory review process, dated 3 October 2006, are repealed with effect from 1 January 2016.

Section 4 – Management of IRRBB

1. High-level Guidelines

Proportionality

13. Institutions should comply with these guidelines in a manner proportionate to their size, complexity and intensity of activity, taking account of Table 3 in Annex B and the provisions of Title 2.1.1 of the EBA guidelines on common procedures and methodologies for the supervisory review and evaluation process (SREP guidelines).¹¹

IRRBB 1 – Internal capital

14. **Institutions should demonstrate that their internal capital is commensurate with the level of the interest rate risk in their banking book, taking into account:**
- (a) the impact on capital resources of potential changes in their economic value and future earnings resulting from changes in the levels of interest rates, and,

¹¹ EBA/GL/2014/13.

- (b) the availability of capital for IRRBB at various levels of consolidation, sub-consolidation and solo entity, as required to do so by competent authorities and consistent with the level of application of the supervisory review and evaluation process.
15. When managing their IRRBB institutions should not rely on the calculations of the outcome of the supervisory standard shock as set out in Article 98(5) of Directive 2013/36/EU or in IRRBB 5, but should develop and use their own internal capital allocation methodologies in accordance with their risk profile and risk management policies.

IRRBB 2 – Measurement of IRRBB

16. **Institutions should measure their exposure to interest rate risk in the banking book, in terms of both potential changes to economic value (EV), and changes to expected net interest income (NII) or earnings.**

In measuring their exposure to IRRBB, institutions should consider and evaluate the impact of:

- (a) assumptions made in respect of non-interest bearing assets and liabilities of the banking book (including capital and reserves);
 - (b) assumptions made in respect of customer behaviour for ‘non-maturity deposits’ (i.e. the maturity assumed for liabilities with short contractual maturity but long behavioural maturity);
 - (c) behavioural and automatic optionality embedded in assets or liabilities.
17. When measuring their IRRBB institutions should not rely on the calculations of the outcome of the supervisory standard shock as set out in Article 98(5) of Directive 2013/36/EU or in IRRBB 5, but should develop and use their own assumptions and calculation methods.

IRRBB 3 – Interest Rate Shock Scenarios

18. **Institutions should routinely measure EV and NII/earnings sensitivity under different scenarios for potential changes in the level and shape of the interest rate yield curve, and to changes in the relationship between different market rates (i.e. basis risk).**
19. Institutions should also consider whether a purely static analysis of the impact of a given interest rate shock or shocks on their current portfolio should be supplemented by a more dynamic interest rate simulation approach. Larger and/or more complex institutions, in particular institutions under categories 1 and 2 of the SREP guidelines¹² should also take into account scenarios where different interest rate paths are computed and where some of the assumptions (e.g. relating to behaviour, contribution to risk and balance sheet size and composition) are themselves functions of changing interest rate levels.

¹² EBA/GL/2014/13.

IRRBB 4.1 – Internal governance arrangements

20. Institutions should implement robust internal governance arrangements with regard to IRRBB.

- (a) The institution should ensure that its management body bears the ultimate responsibility for controlling IRRBB. The management body should determine the institution's overall IRRBB strategy and approve the respective policies and processes.
- (b) Institutions should ensure the regular validation of the models used to quantify their IRRBB. The IT systems used by institutions should enable them to fully measure/assess and monitor the contribution of individual transactions to their overall exposure.
- (c) Institutions' internal risk reporting systems should provide timely and comprehensive information about their exposures to IRRBB.

IRRBB 4.2 – IRRBB Policies

21. Institutions should have well-reasoned, robust and documented policies to address all IRRBB issues that are important to their individual circumstances.

22. Without prejudice to the proportionality principle, such issues should include:

- (a) the internal definition and enforcement of the boundary between “banking book” and ‘trading activities’;
- (b) the definition of economic value and its consistency with the method used to value assets and liabilities (for example based on the discounted value of future cash flows, and/or on the discounted value of future earnings);
- (c) the definition of earnings risk and its consistency with the institution’s approach to developing corporate plans and financial forecasts;
- (d) the size and the form of the different interest rate shocks to be used for internal IRRBB calculations;
- (e) the use of dynamic and / or static approaches in the application of interest rate shocks;
- (f) the treatment of ‘pipeline transactions’ (including any related hedging);
- (g) the aggregation of multicurrency interest rate exposures;
- (h) the measurement and management of basis risk resulting from different interest rate indexes;
- (i) the inclusion (or not) of non-interest bearing assets and liabilities of the banking book (including capital and reserves) in calculations measuring IRRBB;

- (j) the behavioural treatment of current and savings accounts (i.e. the maturity assumed for liabilities with short contractual maturity but long behavioural maturity);
- (k) the measurement of IRRBB effects arising from embedded and automatic options in assets or liabilities, including convexity effects and non-linear payoff profiles;
- (l) the degree of granularity employed in measurement calculations (e.g. use of time buckets, inclusion of interest cash flows or just principal positions).

IRRBB 5 – Supervisory standard shock

- 23. Institutions should report to the competent authority the change in economic value that results from calculating the outcome of the standard shock, as referred to in Article 98(5) of Directive 2013/36/EU and in these guidelines.**
24. When calculating the outcome of the standard shock, institutions should apply in particular the following:
- (a) The standard shock should be based on a sudden parallel +/- 200 basis point shift of the yield curve (applying a 0% floor). If +/-200 basis points is lower than the actual level of change in interest rates, calculated using the 1st and 99th percentile of observed one-day interest rate changes over a five year period scaled up to a 240-day year, the higher level of shock arising from the latter calculation should be applied as the standard shock.
 - (b) An appropriate general 'risk-free' yield curve should be applied. That curve should not include instrument-specific or entity-specific credit risk spreads or liquidity risk spreads. An example of an acceptable yield curve is the 'plain vanilla' interest rate swap curve.
 - (c) Equity capital should be excluded from liabilities, so that the effect of the stress scenario on the economic value of all assets, including those financed by equity capital, can be noted.
 - (d) The assumed behavioural repricing date for customer balances (liabilities) without specific repricing dates should be constrained to a maximum average of 5 years (where the average assumed repricing date is computed as the average of the assumed repricing dates of different accounts subject to behavioural repricing weighted by the nominal value of all such accounts. This means that for the computation of the average maturity, both the stable and the volatile portion will be included).
25. When computing the effect of the 'standard shock' on their economic value, institutions should use one of the calculation methods set out under the Capital at Risk / Economic Value of Equity headings in Tables 1 (Annex A) and Table 3 (Annex B). 'Level 2-4' institutions (as referred to in Annex B) may be asked by supervisors to use more complex calculation methods, incorporating more granular data and changes in client behaviour under stress scenarios.

2. Detailed guidelines

2.1. SCENARIOS AND STRESS TESTING

Additional guidance on IRRBB 3 and on IRRBB 4.1/4.2

a) Interest rate scenarios for ongoing internal management

26. Institutions should measure their exposure as a result of applying an appropriate range of different interest rate scenarios, taking into account of the nature, scale and complexity of the interest rate risk arising from their activities as well as their risk profiles. When selecting the scenarios to be used, institutions should consider:

- (a) sudden up and down parallel shifts in the yield curve of varying magnitudes;
- (b) sudden tilts and changes in the shape of the yield curve (e.g. short-term interest rates increasing/decreasing/remaining unchanged while medium-term and/or long-term interest rates move at a different pace or even in opposite direction; furthermore, even within the categories of short-term, medium-term and long-term interest rates, shocks that diverge at different points in the yield curve);
- (c) basis risk (including that arising from changes in the relationships between key market rates);
- (d) potential changes to the behaviour of different types of asset or liability under the assumed scenarios;
- (e) applying specific interest rate scenarios for exposures in different currencies.

27. Institutions may supplement their analysis by introducing, for instance:

- (a) gradual (as opposed to sudden) shifts, tilts or changes in the shape of the yield curve;
- (b) scenarios based on statistical analysis of past behaviour of interest rates;
- (c) scenarios based on simulations of future interest rate paths;
- (d) scenarios based on the assumptions underlying the institution's corporate profitability forecasts.

28. In performing their scenario analysis, institutions should at a minimum be able to demonstrate that:

- (a) the underlying assumptions of the internal measurement system (see 2.2. and 2.3. of this Section) are appropriate for the different interest rate scenarios used; and
- (b) economic consistency considerations have been properly taken into account when specifying scenarios (e.g. consistency between interest rate shocks in different currencies and foreign

exchange rates used when computing the overall impact expressed in the institution's base reporting currency).

29. A scenario analysis for the internal measurement of IRRBB should be performed at least on a quarterly basis, with the frequency of calculation increased in times of higher interest rate volatility, or when measured risk levels are significant in the context of the institution's business.

b) Interest rate scenarios for stress testing

30. Institutions should regularly perform stress tests to measure their vulnerability under stressed market conditions. Stress testing for interest rate risk should be integrated into each institution's overall stress testing structures and programmes. In these stress tests, interest rate risk should interact with other risk categories and second-round effects should be computed. These tests may be less frequent than the calculations presented above under the heading 'Interest rate scenarios for ongoing internal management'.
31. Institutions should not rely on the standardised 200-basis point parallel interest rate shock performed for the competent authority (see IRRBB 5), but should use an appropriate range of different stress scenarios, in particular:
- (a) sudden parallel interest rate shocks larger than 200 basis points (including extreme shifts);
 - (b) substantial tilts and shifts in the shape of the yield curve (for instance based on those for ongoing internal management, but with more extreme rate changes), and
 - (c) substantial changes in the relationships between key market rates (basis risk).
32. Furthermore, stress tests should consider:
- (a) a breakdown in key assumptions about the behaviour of asset and/or liability classes;
 - (b) changes in key interest rate correlation assumptions;
 - (c) significant changes to current market and macro conditions and to the competitive and economic environment, and their possible development; and
 - (d) specific scenarios that relate to the individual business model and profile of the institution.
33. IRRBB should be included in institutions' overall stress testing program. IRRBB should also be considered as one of the potential drivers in the institution's overall reverse stress testing programmes.

2.2. MEASUREMENT ASSUMPTIONS

Additional guidance on IRRBB 2

a) Behavioural assumptions for accounts with embedded customer optionality

34. In assessing the implications of such optionality, institutions should be able to take account of the potential:
- (a) impacts on current and future loan prepayment speeds arising from the underlying economic environment, interest rates and competitor activity;
 - (b) the speed/elasticity of adjustment of product rates to changes in market interest rates; and
 - (c) the migration of balances between product types as a result of changes in their features, terms and conditions.
35. Institutions should have policies in place governing the setting of, and the regular assessment of, the key assumptions for the treatment of on and off-balance-sheet items that have embedded options in their interest rate risk framework. This means that institutions should:
- (a) be able to identify all material products and items subject to embedded options that could affect either the interest rate charged or the behavioural repricing date (as opposed to contractual maturity date) of the relevant balances;
 - (b) have appropriate pricing and risk mitigation strategies (e.g. use of derivatives) to manage the impact of optionality within risk appetite, which may include early redemption penalties chargeable to the customer as an offset to the potential break costs (where permitted);
 - (c) ensure that modelling of key behavioural assumptions is justifiable in relation to the underlying historical data, and based on prudent hypotheses: a margin of conservatism should be used where there are uncertainties, especially when actual experience differs from past assumptions and expectations;
 - (d) be able to demonstrate that they have accurate modelling (back-tested against experience);
 - (e) maintain appropriate documentation of assumptions in their policies and procedures, and have a process for keeping them under review;
 - (f) understand the sensitivity of the institution's risk measurement outputs to these assumptions, including undertaking stress testing of the assumptions and taking the results of such tests into account in internal capital allocation decisions;
 - (g) perform regular internal validation of these assumptions to verify their stability over time and to adjust them if necessary.

b) Behavioural assumptions for customer accounts without specific repricing dates

36. In making behavioural assumptions about accounts without specific repricing dates for the purposes of interest rate risk management, institutions should:

- (a) be able to identify 'core' (as opposed to 'transient') balances on transaction accounts - i.e. that element of the balance that is consistently kept in the customer account as distinct from balances that are drawn down regularly and then replaced;
- (b) ensure that assumptions about the decay of low cost balances are prudent and appropriate in balancing the benefits to EaR against the additional economic value risk entailed in locking in a future interest rate return on the assets financed by these balances, and the potential foregone revenue under a rising interest rate environment;
- (c) have appropriate documentation of these assumptions in their policies and procedures, and a process for keeping them under review;
- (d) understand the impact of the assumptions on the institution's own chosen risk measurement outputs, including by regularly calculating the measures using contractual terms rather than behavioural assumptions to isolate the effects on both EV and EVR; and
- (e) undertake stress testing to understand the sensitivity of the chosen risk measures to changes in key assumptions, taking the results of such tests into account in internal capital allocation decisions.

c) Corporate planning assumptions for own equity capital

37. If institutions decide to adopt a policy intended to stabilise earnings arising from their own equity, they should:

- (a) have an appropriate methodology for determining what element of equity capital should be considered eligible for such treatment (e.g. adjusting for capital invested in non-interest earning assets such as tangible assets, intangible assets, investments in associates etc.);
- (b) determine what would be a prudent investment maturity profile for the eligible equity capital (e.g. expressed in terms of a particular run-off profile, average maturity or duration range/profile) that balances the benefits of income stabilisation arising from taking longer dated fixed return positions against the additional economic value sensitivity of those positions under an interest rate stress, and the risk of earnings underperformance should rates rise;
- (c) include appropriate documentation of these assumptions in their policies and procedures, and a process for keeping them under review (with appropriate audit trail);
- (d) understand the impact of the chosen maturity profile on the institution's own chosen risk measurement outputs, including by regular calculation of the measures without inclusion of the equity capital to isolate the effects on both EV and EaR; and
- (e) undertake stress testing to understand the sensitivity of risk measures to changes in key assumptions for equity capital, taking the results of such tests into account in their IRRBB internal capital allocation decisions.

38. In deciding the investment term assumptions for equity capital, institutions should avoid taking income stabilisation positions that significantly reduce their capability to adjust to significant changes in the underlying economic and business environment.
39. The investment term assumptions used to manage the risks to earnings and value sensitivity arising from equity capital should be considered as part of the normal corporate planning cycle, and such assumptions should not be altered just to reflect a change in the institution's expectations for the path of future interest rates. Any use of derivative or asset portfolios to achieve the desired investment profile should be clearly documented and recorded.
40. If an institution prefers not to set explicit assumptions for the investment term of equity capital (or sets assumptions that are explicitly short-term), the return generated on assets financed by such capital may be more volatile. The institution should therefore still have robust systems in place and management information available so that it can identify the implications of its chosen approach for the volatility of both earnings and economic value.

2.3. METHODS FOR MEASURING INTEREST RATE RISK

Additional guidance on IRRBB 2 and IRRBB 3

IRRBB measurement methods

41. Institutions should not rely on a single measure of risk but should instead use a wide range of quantitative tools and models, including methods taken from those listed in Annex A (Table 1) of these guidelines, to ensure that the various aspects of interest rate risk are captured adequately. The number and the complexity of different quantitative tools and models used by an institution to measure interest rate risk should be appropriate for nature, scale and complexity of the activities of the institution. The limitations of each quantitative tool and model used should be fully understood by the institution, and these limitations should be taken into account in the interest rate risk management process. In assessing its interest rate risk, an institution should be aware of the risks that may arise as a consequence of accounting treatment of transactions in the banking book.
42. When measuring IRRBB:
 - (a) A base scenario should be applied to reflect the assumptions regarding business development and customer behaviour incorporated into the institution's business plans. The interest rates used for repricing under the base scenario should be derived from spot or forward rates (as appropriate) by applying suitable spreads for different instruments.
 - (b) The refinement of time bands into which the portfolio is divided should adequately reflect the exposures in the portfolio. Institutions should particularly prevent the offsetting of large exposures which are not actually matched by repricing date, thereby hiding yield curve risk.
 - (c) When selecting the discount rates for each instrument type, a yield curve should be selected that most closely represents the characteristics of the instrument type concerned.

- (d) When assessing IRRBB, institutions are encouraged to use different types of yield curve, including instrument/credit-specific yield curves, for their own internal calculations of IRRBB. The set of calculations should always include a measurement of the IRRBB using a 'risk-free' yield curve that does not include instrument-specific or entity-specific credit risk spreads or liquidity risk spreads.
 - (e) When modelling a yield curve, an adequate number of tenors and adequate interpolation techniques should be applied. A set of six tenors is generally considered the minimum requirement.
 - (f) When assessing IRRBB, interest rate scenarios should be used as specified in 2.1. on Scenarios and stress testing. These scenarios should be designed proportionately to reflect the specific characteristics and material risk exposures of each institution.
43. Institutions should identify all different components of the interest rate risk in their banking book. All material risk sub-components should be measured. Table 2 provides examples of methods that may be used to identify the different types of IRRBB.

44. **Table 2: Identification of sub-components of interest rate risk in the banking book**

Component	Method	Focus
Repricing risk	Gap analysis	The volume of mismatches in different time bands
Yield curve risk	Gap analysis, partial durations	The dispersion and concentration of mismatches in different time bands
Basis risk	Inventory of instrument groups based on different interest rates	Use of derivatives and other hedging instruments in terms of different bases, convexity and timing difference neglected by gap analysis
Option risk	Inventory of all instruments with embedded options	The volume of mortgages, current accounts, savings and deposits where the customer has the option to deviate from the contractual maturity

45. For the monitoring of IRRBB, an institution should use at least one earnings-based measure and at least one economic value measure of interest rate risk, but more sophisticated business models should consider multiple measures that, in combination, capture all the material interest risk types in the banking book. The application of simple models and measures is acceptable only where it can be shown that these are sufficient to produce a prudent estimate of risk.
46. Examples of sophistication would include the use of more time bands or tenors, more granular input data and dynamic modelling of feedback from stress scenario assumptions into assumptions about future business volumes and pricing.

47. Table 3 in Annex B contains a matrix giving examples of different sophistication levels for each quantitative tool and measure.
48. In accordance with IRRBB 5, institutions should not rely upon the 'standard shock' as the only measure of their IRRBB. In particular, they should also have an earnings measure, and should consider whether alternative economic value measures are better suited to their business model.

2.4. THE GOVERNANCE OF INTEREST RATE RISK

Additional guidance on IRRBB 4.1 and IRRBB 4.2

a) Overall IRRBB strategy

49. Based on the overarching business strategy, the management body should approve the overall IRRBB strategy of the institution, including the acceptable level for IRRBB and IRRBB mitigation (see also Principle 17 of EBA GL 44 on internal governance).
50. The institution's tolerance for IRRBB should be expressed in terms of the acceptable short-term and long-term impact of fluctuating interest rates on both economic value and earnings and be reflected in appropriate limits. Institutions with significant exposures to basis risk, yield curve risk or positions with explicit or embedded options should define their risk tolerance in relation to each of these material sub-types of IRRBB.
51. The overall IRRBB strategy should also include the decision about the extent to which the business model should rely on generating earnings by 'riding the yield curve', i.e. funding assets with a comparatively long repricing period from liabilities with a comparatively short repricing period. Where the business model relies heavily on this source of earnings, the management body should explain its IRRBB strategy and how it plans to survive periods of flat or inverse yield curves.
52. Institutions should treat IRRBB as a material risk and assess it explicitly and comprehensively in their risk management processes. Any other approach should be fully documented and justified in the course of supervisory dialogue.
53. Limit controls should be in place to ensure positions that exceed certain predetermined levels trigger prompt management reaction.
54. Institutions using derivative instruments to mitigate IRRBB exposures should possess the necessary knowledge and expertise. Each institution should demonstrate that it understands the consequences of hedging with interest rate derivatives.
55. When making decisions on hedging activities, institutions should be aware of the effects of accounting policies, but the accounting treatment should not drive their risk management approach. The management of economic risks should be a priority, and the accounting impacts managed as a secondary concern.

b) Risk policies, processes and controls

56. In relation to IRRBB, the management body should, based on its overall IRRBB strategy, implement robust risk policies, processes and systems which should ensure that:
- (a) procedures for updating scenarios for the measurement/assessment of IRRBB are defined;
 - (b) the measurement approach and the corresponding assumptions for measuring/assessing IRRBB, including the allocation of internal capital to IRRBB risks, are appropriate and proportional;
 - (c) the assumptions of the models used are regularly reviewed and amended;
 - (d) standards for the evaluation of positions and the measuring of performance are defined;
 - (e) appropriate documentation and control over permissible hedging strategies and hedging instruments exists; and
 - (f) the lines of authority and responsibility for managing IRRBB exposures are defined.
57. Institutions should regularly validate their IRRBB models and IT systems. This validation should be performed by a suitably qualified and independent individual.
58. Institutions may rely on third-party IRRBB models to manage and control IRRBB, provided that these models are adequately customised to properly reflect the specific characteristics of the institution in question. Institutions are expected to fully understand the underlying analytics, assumptions and methodologies of the third-party models and to ensure that they are adequately integrated into the institutions' overall risk management systems and processes.

c) IRRBB IT systems and data quality

59. The IT systems and applications used by the institution to carry out, process and record operations as well as to generate reports should be capable of supporting the management of IRRBB. In particular, the systems should:
- (a) be capable of fully and clearly recording all transactions made by the institution, taking into account their IRRBB characteristics;
 - (b) be tailored to the complexity and number of transactions creating IRRBB; and
 - (c) offer sufficient flexibility to accommodate a reasonable range of stress scenarios and new scenarios.
60. The IT system/transaction system should be capable of recording the repricing profile, interest rate characteristics (including spread) and option characteristics of the products to enable measurement of repricing as well as yield curve, basis risk and option risk. In particular, the transaction system should especially be able to gather detailed information on the repricing

date(s) of a given transaction, interest rate type or index, any options (including early repayment or redemption) and the fees relating to the exercise of these options.

61. The systems used to measure the IRRBB should be capable of capturing the IRRBB characteristics of all products. The systems should also allow the disaggregation of the impact of individual IRRBB instruments/portfolios at the risk level of the banking book.
62. For complex, structured products in particular, the transaction system should be able to gather information about the separate parts of the product and to capture their IRRBB characteristics (e.g. the characteristics of assets and liabilities grouped by certain characteristics like repricing dates or optionality elements). The institution should ensure that the IT system is able to keep up with the introduction of new products.
63. Adequate organisational controls of IT systems should be in place to prevent the corruption of data used by IRRBB computer systems and applications, and to control changes to the coding used in those applications, so as to ensure, in particular:
 - (a) the reliability of data used as input, and the integrity of processing systems for IRRBB models;
 - (b) that the likelihood of errors occurring in the IT system, including those occurring during data processing and aggregation, is minimised; and
 - (c) that adequate measures are taken if market disruptions or slumps occur.
64. Risk measures should be based on reliable market and internal data. Institutions should scrutinize the quality of external sources of information used to establish the historical databases of interest rates, as well as the frequency at which databases are updated. To ensure the high quality of data, institutions should implement appropriate processes that ensure that the data entered into IT system is correct. Institutions should also establish appropriate mechanisms to verify the correctness of the aggregation process and the reliability of model results. These mechanisms should confirm the accuracy and reliability of data.
65. The institution should have appropriate procedures to handle any discrepancies and irregularities that arise at the time of data processing. The institution should determine the reasons for these and should have procedures in place for the mutual reconciliation of the positions to enable these discrepancies and irregularities to be eliminated.
66. The institution should set up an appropriate process to ensure that the data used to feed models measuring the IRRBB across the group, e.g. for simulating earnings, is consistent with the data used for corporate planning.

d) Internal Reporting

67. The frequency of internal reports should increase with the complexity of the institution's operations, with quarterly reports being the minimum frequency for institutions with less

complex portfolios. Similarly, the content of the reports should reflect changes in the risk profile of the institution and in the economic environment.

68. Internal reports should be provided to the different levels of management, and should contain an appropriate level of information for the particular level (e.g. management body, senior management) and for the specific situation of the institution and the economic environment.
69. Aggregated information should provide sufficient detail to enable the management to assess the sensitivity of the institution to changes in market conditions and other important risk factors. These reports should contain information on exposures to repricing, basis, yield curve and optionality risk as well as information on the types and results of stress tests performed, including the standard shocks prescribed by the competent authority.
70. The risk measurement system should generate reports in a format that allows the different levels of the institution's management to understand the reports easily and to make appropriate decisions in a timely manner. The reports should constitute the basis for regular monitoring of whether the institution operates in line with its strategy and the interest rate risk limits it has adopted.

2.5. CAPITAL IDENTIFICATION, CALCULATION AND ALLOCATION

Additional guidance on IRRBB 1

71. In their ICAAP analysis of the amount of capital required for IRRBB, institutions may consider differentiating between:
 - (a) current internal capital held for risks to economic value that could arise from a sudden interest rate shock; and
 - (b) future internal capital requirements arising from the impact of rate changes on future earnings capacity, and the resultant implications for internal capital buffer levels.
72. Where an institution's policies/limits permit the taking of interest rate risk positions within the banking book, these risks should be measured and monitored like any other market risk. Internal capital should be specifically allocated to reflect these risks, the quantum of which may be gauged by considering other capital requirements for market risk. Institutions should regularly consider whether any positions held should be characterised as 'trading' and thereby treated accordingly for capital adequacy purposes.
73. In addition to considering whether internal capital should be held for actual IRRBB economic value risk, institutions should also consider:
 - (a) the size and tenor of any mismatch limits intended to allow the institution to take advantage of an interest rate expectation by creating or leaving un-hedged interest rate risk positions in the banking book (subject to appropriate governance and within an agreed risk appetite definition);

- (b) the size and tenor of any mismatch limits put in place to allow for small timing and balance mismatches arising from retail banking products where precise micro-hedging may be impractical;
 - (c) the sensitivity of the calculated interest rate risk to imperfect modelling assumptions (model risk); and
 - (d) short-term timing and other imperfections in the matching of portfolios to behavioural/planning assumptions, or where the policy allows discretion by indicating a duration range or allowing mismatch tolerances for behavioural items.
74. To calibrate the amount of internal capital to be held for IRRBB economic value risk, institutions should use appropriate economic value measurement systems for their business profile (see 2.3 on methods for measuring interest rate risk) and an appropriate range of interest rate scenarios (see 2.1 on scenarios and stress testing) in order to quantify the potential scale of any IRRBB effects under stressed conditions.
- (a) Institutions should consider whether an allocation of internal capital is appropriate for some (or all) of the economic value at risk resulting specifically from behavioural or corporate planning assumptions (see 2.2 on measurement Assumptions).
 - (b) Institutions that operate economic capital models should ensure that the internal capital allocation for IRRBB is properly factored into the overall economic capital allocation, and that any assumptions on diversification are documented and derived from full analysis of the underlying correlation data. Economic capital costs may be allocated back to business units and products to ensure that the full costs of the underlying business/products are properly understood by those responsible for managing them.
 - (c) Institutions that are exposed to interest risk in different currencies should ensure that all material positions are taken into account, and that internal capital allocated for economic value at risk allows for different changes in interest rates for each currency (as opposed to assuming all rates for all currencies will move in parallel).
75. In considering whether an allocation of internal capital should be made in respect of interest EaR (as part of a capital buffer allocation for stress testing), institutions should take into account:
- (a) the relative importance of NII to total net income, and therefore the impact of significant variations in NII from year to year;
 - (b) the actual levels of NII achievable under different scenarios (i.e. the extent to which margins are wide enough to absorb volatility arising from interest rate positions, changes in the cost of liabilities); and
 - (c) the potential for actual losses to be incurred under stressed conditions, or as a result of secular changes in the market environment, where it might become necessary to liquidate positions that are intended as a long-term hedge to stabilise earnings.

76. To determine whether an amount of internal capital should be allocated for potential future risks to earnings arising from changes to interest rate risks under stressed conditions, institutions should use appropriate EaR measurement systems for their business profile (see 2.3 on methods for measuring interest rate risk) and an appropriate range of interest rate scenarios (see 2.1 on scenarios and stress testing).
77. Institutions should consider internal capital buffer adjustments where the results of their stress testing highlight the potential for reduced NII (and therefore reduced capital generation capacity) under stress scenarios. To the extent that NII has been protected/stabilised against adverse movements in rates through risk management strategies based on behavioural and/or corporate planning assumptions, institutions may be able to reduce the size of this internal buffer allocation, and buffer allocations can be drawn down should the stress scenario materialise.

Annex A - IRRBB Measurement Methods

Table 1: Tools for measuring different components of interest rate risk

Quantitative tools and models	Description	Advantages and limitations	Risk types potentially measured
Earnings measures			
Static model			
Gap analysis	Gap analysis is a simple tool for identifying and estimating the interest rate exposure to repricing risk. It measures the arithmetic difference between the nominal amounts of interest-sensitive assets and liabilities of the banking book in absolute terms. Gaps with a larger volume of assets have a positive sign reflecting increasing value (income) of the banking book with rising value (income) of assets. Liability gaps have a negative sign reflecting decreasing value (income) of the banking book with rising value (income) of liabilities. Gap analysis allocates all relevant interest-sensitive assets and liabilities into a certain number of predefined time bands according to their next contractual repricing date or behavioural assumptions regarding the maturity or the repricing date. A gap can be multiplied by an assumed change in interest rates to yield an approximation of the change in net annualised interest income that would result from such an interest rate movement.	<p>Advantage: Simple method that is relatively easy to understand and explain.</p> <p>Limitations: Based on the assumption that all positions within a particular maturity segment mature or reprice simultaneously.</p> <p>Static model that does not take account of the interest sensitivity of the optionality parameters.</p> <p>Yield curve and/or basis risk cannot be analysed adequately using gap analysis.</p>	Repricing risk
Dynamic models			
Earnings at risk	EaR measures the loss of NII (and other income) over a particular time horizon (one to five years) resulting from interest rate movements, either gradual movements or as a one-off large interest rate shock. Allocation of relevant assets and liabilities to time bands by maturity or repricing date is a starting point. EaR is the difference in NII between a base scenario and alternative scenario. The interest rates used for repricing in the base scenario are derived from the forward rates by applying appropriate	<p>Advantages: It analyses the interest rate risk profile of the banking book in a detailed way tailored to the bank's specific circumstances. Comprehensive dynamic method that takes account of all components of the interest rate sensitivity and gives a good indication of the short-term effects of</p>	Repricing risk Yield curve risk Basis risk Option risk

Quantitative tools and models	Description	Advantages and limitations	Risk types potentially measured
	<p>spreads and spot/forward rates for different instruments. In the alternative scenario, the interest rate and spread shifts are added onto the forward rates used in the base scenario.</p> <p>With properly designed comprehensive stress test scenarios it is a dynamic method that takes account of all components of the interest rate sensitivity including yield curve risk, basis risk, credit spread risk and insight into the changes in savings and payment behaviour taking account of projected changes in maturities and repricing relationships and the size of the banking book. EaR can be applied as a measure for a single shock or as a simulation method applying a large range of scenarios followed by computation of a maximum loss within predefined confidence interval.</p>	<p>convexity and yield curve risk.</p> <p>Limitations: The results of the modelling are highly sensitive to assumptions about customer behaviour and management responses to different scenarios. It covers a relatively short horizon, so changes in earnings outside the observation period are ignored.</p>	
Economic value measures			
Static model			
Capital at risk / economic value of equity	<p>CaR/EVE measures the theoretical change in the net present value of the current balance sheet and therefore of its equity value resulting from an interest rate shock. In this method the value of equity under alternative stress scenarios is compared with the value under a base scenario. The value of equity is computed as the present value of assets less liabilities, not including assumptions about equity capital. For internal purposes, institutions may complement this computation of CaR/EVE with a model of CaR/EVE that takes the assumptions regarding equity capital into account.</p> <p>The accuracy of the valuation of the balance sheet positions is heavily dependent on the cash flows calculated and the discount rates used</p>	<p>Advantages: A simple measure of interest rate risk that takes account of some key elements of interest rate risk.</p> <p>Limitations: An NPV calculation that does not adjust for the impact on cash flows of the rate scenario will not pick up basis or option risk.</p> <p>Valuation based on net present value calculations is heavily dependent upon assumptions made regarding the timing of cash flows and the discount rate used.</p> <p>The method may underestimate the short-term effect of convexity and yield curve risk.</p>	<p>Repricing risk</p> <p>Yield curve risk</p>
Modified duration of equity and PV01 of equity	<p>Modified duration shows the relative change in the market value of a financial instrument corresponding to marginal parallel shifts of the yield curve by one percentage point. On an aggregated basis it can be applied</p>	<p>Advantages: It analyses the economic value impact of a given change in interest rates relating to a particular class</p>	<p>Repricing risk</p>

Quantitative tools and models	Description	Advantages and limitations	Risk types potentially measured
	<p>to the total banking book. The exposure to repricing risk in the banking book is expressed by the modified duration of equity. An absolute measurement derived from modified duration of equity is PV01 of equity. This measure expresses the absolute change of the equity value resulting from a one basis point (0.01%) parallel shift of the yield curve.</p> <p>The starting point is the allocation of assets and liabilities into time bands according to their repricing date and the type of instrument. For each instrument type an appropriate yield curve is selected. For each time band and instrument type a modified duration is computed. The modified duration of equity is then computed as an average of the modified durations of all time bands weighted by the exposures in the appropriate time bands (positive sign for asset gaps and negative sign for liability gaps). PV01 of equity is derived by multiplying the modified duration of equity by the value of equity (assets – liabilities) and divided by 10,000 to arrive at basis point value.</p>	<p>of assets and liabilities or the balance sheet as a whole in a simple way.</p> <p>Limitations:</p> <p>It only applies to marginal shifts of the yield curve. Relatively large movements in interest rates, and therefore convexity, cannot be measured accurately.</p> <p>It only applies to parallel shifts of the yield curve and it cannot be used to measure basis or yield curve risk.</p> <p>It is a static model that does not take account of the interest sensitivity of the optionality parameters.</p>	
Partial modified durations and partial PV01	<p>Partial modified durations and PV01 are computed for the net interest rate positions in sub-portfolios representing different time bands of the banking book according to the methodology described above. These partial measures show the sensitivity of the market value of the banking book to a marginal parallel shift of a yield curve in particular maturity segments. To each sub-portfolio's partial measure a different magnitude of a parallel shift can be applied by which the effect of the change of the shape of the yield curve can be computed for the entire portfolio. By dividing the banking book into time band sub-portfolios, institutions should consider the distribution of exposures across the time bands so that the sub-portfolios adequately reflect the exposure of the banking book to the yield curve risk.</p>	<p>Advantages:</p> <p>It analyses the impact of the changes of yield curve shapes on the economic value of the banking book.</p> <p>Limitations:</p> <p>It only applies to marginal shifts of the yield curve within each segment.</p> <p>It is a set of static measures that does not take into account the optionality, basis risk and convexity.</p>	Yield curve risk
Dynamic models			
Capital at risk / economic value of equity	<p>A more sophisticated version of the static measure (explained above), where the cash flows are re-calculated dynamically to take into account the fact that their size and the timing may differ under the various scenarios as a result of customer behaviour in reaction to the chosen</p>	<p>Advantages:</p> <p>As long as the alternative stress scenarios are adequately designed, it is a comprehensive measure of interest rate risk that takes into account all</p>	<p>Repricing risk</p> <p>Yield curve risk</p> <p>Basis risk</p>

Quantitative tools and models	Description	Advantages and limitations	Risk types potentially measured
	<p><i>scenario. This measure is designed to also account for basis risk and it can estimate the long-term effect of a change in a yield curve shape if alternative scenarios are adequately designed.</i></p>	<p><i>components of interest rate risk.</i></p> <p>Limitations: <i>Valuation based on net present value calculations is heavily dependent upon assumptions made as to the timing of cash flows and the discount rate used.</i> <i>The method may underestimate the short-term effect of convexity and yield curve risk.</i></p>	<p><i>Option risk</i></p>
Effective duration of equity	<p><i>Effective duration measures value changes due to marginal parallel shifts of the yield curve. An example is the modified duration that additionally arises from the interest rate sensitivity of embedded optionality. The computation of the effective duration is based on deriving the change in value of a portfolio due to an interest rate increase or decrease compared to a base scenario, where not only the changes in the discount rate are incorporated, but also the interest rate-related changes in the magnitude of the expected cash flows for instruments containing embedded options.</i></p>	<p>Advantages: <i>It analyses the economic value impact of a given change in interest rates taking the option risk into account in a simple way.</i></p> <p>Limitations: <i>It only applies to marginal shifts of the yield curve and it accounts only for the interest sensitive part of the option risk in the portfolio.</i></p>	<p><i>Repricing risk</i> <i>Option risk</i></p>
Value at Risk	<p><i>The VaR method measures the expected maximum loss of market value that can be incurred under normal market circumstances over a given time horizon and subject to a given confidence level. For calculation of VaR in the banking book the changes in the market value of the banking book and therefore of the equity is computed for a set of alternative yield curve scenarios. When the VaR approach is applied to the banking book, the time horizon should be consistent with the economic model of the banking book and is usually expected to be one year.</i></p> <p><i>The VaR approach covers three different techniques:</i></p> <ul style="list-style-type: none"> <i>Historical simulation: alternative interest rate scenarios are derived from historical observations. Historical periods applied need to be long enough to capture significant shocks but short enough to still be relevant. Choosing a holding period for computational purposes, an institution needs to avoid autocorrelation within the sample, but at the same time ensure a significant number of observations and</i> 	<p>Advantages: <i>It takes into account the historical volatility of prices and interest rates.</i> <i>It takes into account diversification effects in or between portfolios or balance sheet positions.</i> <i>The method not only measures the magnitude of the loss, but also allows the probability of the loss to be chosen.</i></p> <p>Limitations: <i>VaR measure is designed for normal market circumstances and does not adequately cover tail risk. It is therefore not sufficient to rely on VaR measures alone when considering extreme distress situations.</i> <i>Both historical VaR and variance-covariance VaR are backward-looking methods where history is</i></p>	<p><i>Repricing risk</i> <i>Yield curve risk</i> <i>Basis risk</i> <i>Option risk</i></p>

Quantitative tools and models	Description	Advantages and limitations	Risk types potentially measured
	<p><i>presence of a shock within the observations.</i></p> <ul style="list-style-type: none"> • <i>Variance-covariance matrix: interest rates of different tenors for simulations derived from historical observations and variance-covariance matrix used to account for the correlations of the rates between tenors. The same considerations as by historical VaR apply.</i> • <i>Monte Carlo simulation: interest rate yield curves and interest rate paths randomly simulated. This technique is especially suited for valuation of products containing options.</i> <p><i>The extent to which different interest rate risk types are measured depends on the model design and scenarios used. VaR models are suitable for capturing the optionality and convexity of products as well as the yield curve risk and basis risk.</i></p>	<p><i>indicative of the future and therefore more likely not to capture the tail risks.</i></p> <p><i>The variance-covariance method assumes that the returns are normally distributed statistically, and that the portfolios are a linear combination of the underlying positions; as a result, the method is less appropriate for portfolios with high optionality.</i></p> <p><i>The Monte Carlo simulation method is very demanding in terms of technology and computation.</i></p> <p><i>VaR models can become 'black box' systems that users rely upon without fully understanding them.</i></p>	

Annex B - Sophistication Matrix for IRRBB measurement

Table 3 below contains a matrix providing examples of different sophistication levels for each quantitative tool and measure, but many more degrees of sophistication are possible. To assess different interest rate sensitivities, an institution might choose several sophistication levels for one single measure. For example, it might use a static version of a measure to assess linear interest rate risk and a dynamic version to reveal its sensitivity to assumptions regarding consumer behaviour. Less sophisticated banks may quantify their sensitivity to behavioural assumptions by using multiple versions of the same static measures – i.e. without modelling the complete set of dynamic effects. The aim is that banks should select this mix of relevant and proportionate measures so that all material sensitivities to the interest rate changes are adequately captured, including sensitivity to behavioural assumptions.

The matrix in Table 3 is intended to aid individual institutions and competent authorities by suggesting a possible combination of quantitative tools and measures appropriate for a given sophistication level.

A general supervisory expectation should be that larger or more complex institutions should use more granular time bands and should analyse risk using transaction level data whenever possible. Institutions offering financial products containing embedded optionality should use measurement systems that can adequately capture the sensitivity of the options to interest rate changes. Institutions with products providing behavioural optionality to consumers should use adequate dynamic modelling approaches to quantify IRRBB sensitivity to the changes in consumer behaviour that could occur under different interest rate stress scenarios.

The four sophistication ‘levels’ for institutions are intended to stand as broad definitions of increasingly large and complex types of business model. Thus:

- Level 1 institutions could be small local banks with a simple product set that involves only limited exposure to the interest rate risk, such as specialist private banks or small-scale savings banks.
- Level 2 institutions could be small retail banks with a wider range of products giving exposure to interest rate risk including behavioural risk.
- Level 3 institutions could be mid-sized local or international banks including utility banks.
- Level 4 institutions could be large international and universal banks.

The sophistication level of risk measures selected by each institution should correspond to the sophistication level of the institution itself. If, in a particular case, the complexity is not a function of scale, institutions should choose and implement risk measures that reflect their specific business model and that adequately capture all sensitivities.

Table 3: Different sophistication levels of interest rate risk measurement

<u>Quantitative tools and models</u>	Indicative sophistication levels of quantitative tools and models			
	Level 1	Level 2	Level 3	Level 4
Earnings measures				
Gap analysis	Time bands advised in the Basel Committee on Banking Supervision's "Principles for the Management and Supervision of Interest Rate Risk" from July 2004 ('Basel 2004 Guidelines').	More refined time bands reflecting the banking book composition.	Dynamic GAP taking into account run-off activities and financial plans and putting commercial margins in perspective with interest rate environment.	Dynamic GAP taking into account run-off activities and financial plans, and putting commercial margins in perspective with interest rate environment.
Earnings at risk	Standard shock applied to earnings in a constant balance sheet. Based on time bands advised in Basel 2004 Guidelines.	Standard shock and other yield curve stress tests specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance applied to earnings, reflecting constant balance sheet or simple assumptions about future business development.	Yield curve stress tests, basis risk stress tests and option stress tests as specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance separately applied to earnings projected by business plan or constant balance sheet.	Comprehensive stress scenarios, combining assumed shifts of yield curves with changes in basis and credit spreads, as well as changes in customer behaviour, used to reforecast business volumes and earnings to measure the difference compared with the underlying business plan.
Economic value measures				
Capital at risk / Economic value of Equity	Application of standard shock. Using time bands, tenors and aggregation of input data that is consistent with internal IRRBB measurement standards or using time bands and weights advised in Basel 2004 Guidelines, Yield curve model with a minimum of 6 tenors.	More refined time bands reflecting the banking book composition with own duration weights. Application of standard shock and other yield shifts specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. Sufficient yield curve tenors.	Refined time bands subdivided into instrument types with own duration weights or the measure computed on transaction/cash-flow basis. Application of standard shock and other yield shifts specified in the Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. Adequate tenors in yield curves. Yield curve stress tests, basis risk stress tests as	Measure computed on a transaction or cash-flow basis. Comprehensive stress scenarios combining the shifts of yield curves and changes in customer behaviour.

Quantitative tools and models	Indicative sophistication levels of quantitative tools and models			
	Level 1	Level 2	Level 3	Level 4
			specified in Section 4 - 2.1 on scenarios and stress testing in the additional detailed guidance. Modelling the interest rate sensitivity of modelling assumptions taking into account convexity.	
Modified duration of equity and PV01 of equity	Time bands and weights advised in Basel 2004 Guidelines. Application of standard shock. Yield curve model minimum six tenors.	More refined time bands reflecting the banking book composition with own duration weights. Application of standard shock and other yield shifts specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. Sufficient yield curve tenors.	Refined time bands subdivided into instrument types with own duration weights. Application of standard shock and other yield shifts specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. Adequate tenors in yield curves. Application of partial measures per time band.	Duration computed per transaction in the banking book. Application of standard shock and other yield shifts specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. Adequate tenors in yield curves. Application of partial measures per time band.
Effective duration of equity	Alternative scenarios based on standard shock and effect of option estimated roughly for entire portfolio.	Alternative scenarios based on standard shock and other shifts of yield curve specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. The effect of options estimated per instrument type.	Alternative scenarios based on standard shock and other shifts of yield curve specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. The effect of options estimated on transaction level.	Alternative scenarios based on standard shock and other shifts of yield curve as specified in Section 4 – 2.1 on scenarios and stress testing in the additional detailed guidance. The effect of options estimated at transaction level.
Value at risk	Yield curve model minimum six tenors.	Sufficient tenors on yield curves where material exposure exists. Inclusion of other sensitivity parameters as well as delta (Greek letters).	Adequate tenors in yield curves where material exposure exists. Full optionality valuation. Daily update of risk factors. Usage of, at least, volatility smiles.	Adequate tenors in all yield curves. Full optionality valuation. Include Monte Carlo simulations on portfolios with material optionality. Daily update of risk factors. Usage of volatility surfaces for all underlyings in the banking book.

4. Accompanying documents

4.1 Overview of questions for consultation

Q1. Do you agree that the proposed changes to the original Guidelines text of IRRBB 1 are required in order to make clear that institutions' internal capital should be commensurate with the level of the interest rate risk in their banking books?

Q2. Do you agree that a more consistent approach to calculating the effect of the standard supervisory shock is necessary? Will the proposed changes to the text of IRRBB 5 achieve a more consistent approach?

Q3. Do you agree that an average duration of 5 years is appropriate for the behavioural assumption for non-maturity liabilities when calculating the effects of the standard shock. If not, what duration and/or measure would you suggest instead? Should the volatile portion be included in the average, or just the stable core?

Q4. Should the calculation of the level of the economic value use a risk free yield curve that excludes instrument or entity specific credit risk spreads and/or liquidity risk, or should assets and liabilities be valued using an institution-specific credit risk curve? Should the calculation of the net interest income consider the change of the credit spread of assets and liabilities for the repricing of instruments that mature?

Q5. Do you agree that equity capital should be excluded from the calculation of the impact of the standard shock, when the results are used for supervisory purposes?

Q6. Do you agree that the original Guidelines should be amended to include a principle covering internal governance arrangements?

Q7. Is the provision of additional technical guidance, to be read alongside the original Guidelines (as updated), helpful in highlighting the key issues to be considered by both institutions and supervisors?

Q8. Should the Technical Guidance remain a separate document, or should it be embedded within the overall Guidelines?

Q9. Do you agree that institutions should regularly measure their IRRBB exposure under an appropriate range of different interest rate scenarios, not just comprising standard shocks based on sudden parallel shifts of the yield curve?

Q10. Should stress testing for IRRBB be integrated into the institution's overall stress testing structures and programmes?

Q11. Do you agree that key behavioural assumptions affecting accounts with embedded customer optionality should be subject to regular review and testing to ensure that they remain valid?

Q12. Do you agree that behavioural assumptions about the re-pricing characteristics of customer accounts without specific repricing dates should be prudent and appropriate in balancing the benefits to longer-term earnings against the economic value at risk?

Q13. Do you agree that assumptions for the investment term of equity capital should be fully recorded and considered as part of the institution's corporate planning cycle (rather than as a tactical decision in reaction to changes in market rates)? Is further guidance needed on calculating the investment term of equity?

Q14. Do you agree that institutions should monitor both risk to earnings and risk to economic value?

Q15. Do you agree that institutions should use a variety of risk measures to ensure better coverage of embedded risks?

Q16. Do you agree with the guidance matching measures with different levels of sophistication in Table 3?

Q17. Do you agree that there should be additional guidance provided on aspects of internal governance specific to IRRBB?

Q18. Do you agree that the main governance issues for IRRBB relate to overall IRRBB strategy, risk policies, processes and controls, IRRBB IT systems and data quality, and internal reporting?

Q19. Do you agree that it is helpful to distinguish between capital allocated for the potential IRRBB impact on economic value, and the implications for future capital requirements arising from changes to earnings resulting from interest rate risks?

Q20. Do you agree that the quantum of internal capital allocated against market risk positions in the banking book should be gauged by considering other capital requirements for market risks?

Q21. Do you agree that institutions should hold internal capital based on available limits rather than actual utilisation of those limits?

Q22. Do you agree that institutions should allocate internal capital against potential future earnings at risk, based on the result of their stress-testing?

Q23. Are the cross-references between the high level Guidelines and the technical guidance helpful?

Q24. Does the glossary need to be extended to cover more technical terms? If so, please suggest additional terms and definitions.

Q25. Should credit spread risk (both the institution's own credit spread, and market spreads more generally) be treated as a form of basis risk to be factored into the measurement of IRRBB, and, if so, how should this best be achieved?

Q26. Do you agree with the main conclusions of the cost/benefit analysis / impact assessment? If no, please elaborate your opinion.

Q27. Do you agree that all institutions should be able to implement both economic value and earnings measures of IRRBB without significant additional cost? If no, please provide adequate reasoning and evidence.

4.2 Views of the Banking Stakeholder Group (BSG)

No comments were received from the BSG.

4.3 Feedback on the public consultation

On 27 June 2013, the EBA launched a public consultation (EBA/CP/2013/23) on the guidelines. The consultation period lasted for three months and ended on 27 September 2013.

This chapter presents a summary of the key points and other comments arising from the consultation, the analysis and considerations triggered by these comments, and the actions taken by the EBA to address them if deemed necessary.

The guidelines incorporate changes made as a result of the responses received during the public consultation. As a result of work by the EBA on the SREP under CRD IV, the elements of the draft guidelines that were specifically addressed to competent authorities have also been removed from the final IRRBB Guidelines and included instead in Title 6.6 of the EBA's SREP Guidelines¹³.

Summary of key issues and the EBA's response

In total, nineteen (19) responses were received; one (1) respondent asked for their response not to be published but the remainder were published on the EBA website. A well-attended public hearing was held on 13 September 2013.

1. Structure and implementation of the guidelines

On the whole, the respondents welcomed the consultation and provided some positive feedback. A large majority **agreed that the proposed changes to the original Guidelines were necessary** to update outdated elements and clarify the approach taken by competent authorities to assessing interest rate risk, including the allocation of capital where appropriate.

A strong majority of **respondents supported the publication of additional technical guidance**, to be read alongside the high-level guidelines, and the final version incorporates both the high-level

¹³ EBA Guidelines on SREP Title 6, IRRBB assessment methodology

and detailed guidance in a single document. The inclusion of reference tables and a glossary was welcomed: The EBA has expanded the glossary to include a definition of ‘credit spread risks’ and of ‘non-maturity accounts’. The unanimous feedback from respondents was that credit spread risks should be treated separately to IRRBB: A statement has been included in the final guidelines to clarify that **credit spread risk is not covered in the guidelines**, although it is closely related to IRRBB.

A few respondents were concerned that the implementation of the new guidelines could prove to be a significant undertaking for some institutions, particularly those with less complex business models that have not measured both earnings and economic value risks so far. The EBA believes that implementation should not be unduly problematic, bearing in mind the explicit expectation of a proportionate approach based on scale and complexity. Nonetheless, the **EBA has agreed that the implementation date should be set as 1 January 2016.**

Some respondents also commented that the treatment of IRRBB is currently under consideration by the Basel Committee on Banking Supervision, and argued that it would be better for the EBA to wait for the outcome of that review before updating its own guidelines. The EBA recognises that supervisory and industry practices may change over time, and the revised guidelines will be kept under review in the light of work by the Basel Committee. However, the Basel work is focussed on how to calculate the appropriate supervisory capital allocation for IRRBB, whilst the EBA guidelines mainly focus on how IRRBB should be quantified and managed by institutions. The EBA is participating in the Basel work, and the Basel Task Force on Interest Rate Risk includes some of the individuals responsible for developing the EBA guidelines, so there will be scope for continuity of approach. If the Basel Committee does implement new guidelines of its own, there would be a delayed transition period that would allow time for the EBA to update its guidelines if necessary.

2. Supervisory ‘standard shock’

Respondents mostly understood that **a more uniform approach to calculating the effect of the supervisory ‘standard shock’ was necessary** to be able to identify outlier institutions more consistently. However, **many respondents were concerned about the proposed methodology to calculate the impact of the supervisory shock, and in particular the exclusion of equity capital resources from the calculation.** Many reservations were also raised about the proposed treatment of deposits without specific repricing dates in the standard shock calculation, and in particular the **imposition of a maximum five year average maturity** for these. The substance of the objections included:

- The calculation of the supervisory shock could conflict with the internal management of IRRBB and lead competent authorities to the wrong conclusions about actual levels of risk.
- The exclusion of capital from the standard shock calculation would penalise institutions with higher levels of equity capital, particularly if they used structural fixed-rate asset positions to manage the risk of earnings volatility arising from capital.

- The imposition, in the standard shock methodology, of a maximum five-year average maturity cap on behaviouralisation of non-maturity liabilities was arbitrary, and would not correspond with internal analysis or management approaches; it could also cause a market anomaly if all institutions were to try and hedge to the same maturity point.
- The effect of the guidelines could be to increase the level of IRRBB - for an institution, applying too short an earnings profile could be less prudent than applying too long a profile. What is prudent depends on the characteristics of both of the institution and the markets it operates within.
- There could be macroeconomic effects on the availability of certain products, particularly longer-term fixed rate loans. This would have the effect of transferring interest rate risk to borrowers, and could increase credit risks.

The EBA notes that the common assumption underlying all the concerns raised by respondents is that competent authorities will automatically require additional capital to be held against IRRBB as measured by the standard supervisory shock and that, as a result, institutions will change their risk management approaches to minimise the effect of the supervisory shock. This is not the intention of the Guidelines, which clearly indicate that **there is no automatic implication that additional capital will be required based on the result of the standard shock**. The shock is intended solely to allow a common starting-point for competent authorities to consider the extent of IRRBB in an institution.

In response to the feedback, the EBA has therefore amended the wording of the guidelines to clarify that the standard shock measure is intended solely for supervisory purposes so as to identify potential outliers, and that **the guidance on the standard shock does not constitute a recommendation to institutions regarding supervisory expectations as to how they should manage IRRBB internally**. The relevant section of the SREP Guidelines recommends that, in reviewing an institution's standard shock outcome, competent authorities should seek to understand the impact of the institution's internal behavioural adjustments, such as those for customer accounts without specific repricing dates and/or equity capital; this can be achieved by isolating the economic value risks arising purely from earnings stabilisation activity to identify those arising from other aspects of its business model. The overall objective is that both competent authorities and institutions themselves should understand the true nature of the IRRBB risks being taken, and that **capital requirements should take account of the overall approach to managing risks to both earnings and economic value**.

There was some confusion among respondents about how the guidance on sophistication levels and expectations for measurement approaches (Table 3 in Annex B of the Detailed Guidance) should be interpreted and in particular whether the draft guidelines implied that the standard shock calculation methodology used should relate to the complexity of the institution's business model. The EBA agrees that more clarity is needed and the **section on sophistication levels has been redrafted** to highlight four sophistication 'levels' for institutions, which are intended to provide broad definitions of increasingly large and complex types of bank business models. The

final guidelines also confirm (in the revised wording of IRRBB 5) that, for comparability purposes, **only the most basic of the EV calculations is expected for calculating the standard shock outcome** (although the SREP guidelines allow for competent authorities to ask for more sophisticated calculations if deemed appropriate for a specific institution).

With regard to whether the calculation of standard shock should use a risk-free yield curve that excludes instrument or entity-specific credit risk spreads and/or liquidity risk, respondents' views of respondents were quite polarised between those favouring a risk free curve and those who thought that each element of the calculation should be valued using a relevant credit curve. The EBA has clarified (in IRRBB 5) that, **for the standard shock, a single risk-free curve should be used** – for simplicity and comparability reasons. However, the updated guidelines also state that institutions should consider whether to use instrument-specific curves for internal measurement purposes, where proportionate.

3. Governance and stress testing framework

The majority of respondents agreed that the original guidelines **should be amended to include a Principle covering internal governance arrangements**. They also agreed that **additional guidance on aspects of internal governance specific to IRRBB was needed**. The new High-level guidelines on internal governance (IRRBB 4.1) have therefore been introduced, and the detailed guidance on governance arrangements retained in the final version of the guidelines.

Regarding stress testing, the majority of respondents agreed that IRRBB should not be analysed in isolation. They believed it was necessary to capture correlations between IRRBB and other risks (e.g. credit, liquidity and market risks), and to include IRRBB in institutions' overall stress testing structures. The wording of the final guidelines has been amended accordingly, indicating that **IRRBB should normally be included in the overall stress testing program** of each institution. Respondents also agreed that behavioural components affecting customer accounts with embedded optionality should be reviewed and tested regularly, as part of a structured back-testing framework. Objective and independent validation of all applied assumptions was agreed to be essential.

4. Measurement of both earnings and economic value risks

Respondents generally, but not universally, agreed that it was **appropriate for institutions to monitor both risks to earnings and risks to economic value**. Most argued that the importance of each metric in IRRBB management would differ between institutions, and they suggested that the balance between the two metrics should be decided internally. Some respondents argued that it was inappropriate or even impossible for institutions to manage both measures simultaneously, and that the internal approach should be focussed on a single measure.

The EBA continues to believe that banks should measure both earnings and value volatility, since they are complementary measures that together give a fuller overview of the elements of IRRBB. Concentrating on one measure to the exclusion of the other could leave an institution 'blind' to certain risk elements. In response, the final Guidelines include **an updated version of IRRBB 2 stating that institutions should measure both economic value and earnings risk**, and stress

clearly that **institutions should consider the relative importance of both measures for internal management purposes**. Additional explanations of measurement options have been included in the detailed guidance on 'Tools for measuring different components of interest rate risk'.

Most respondents agreed that institutions should use a variety of risk measures to ensure better coverage of IRRBB. However, some asked for more clarity on the application of the proportionality principle. The EBA has therefore included additional wording within the guidelines some additional which **confirms the need for proportionality**.

5. Capital allocation for IRRBB

Many respondents expressed concerns that the draft guidance on allocating internal capital would result in an overly conservative approach by both institutions and their competent authorities, with significant potential for double-counting if both economic value and earnings effects were capitalised. There was negative feedback on the use of limits to gauge the level of exposure that should be considered for capital allocation purposes, and respondents were unconvinced about the read-across from capital requirements in the trading book as a basis for calibrating IRRBB capital. Respondents considered that capital allocations should follow the actual management approach being used by the institution, rather than being based on externally imposed assessment.

The **EBA does not accept that the draft guidelines would result in over-capitalisation of the risk**, nor that the proposals would lead to double-counting. In fact, the guidelines do not contain any specific guidance on the actual level of capital that should be allocated internally by institutions to IRRBB, but concentrate instead on identifying the factors (e.g. limits, trading book treatment, earnings and economic value implications) that should be considered in arriving at an internal capital allocation. The main elements of the feedback are therefore not accepted. However, some minor text amendments have been made to improve clarity in these areas.

The EBA recognises that further, more general clarification in the Guidelines would be helpful, especially given the split between guidance for institutions (in the final IRRBB guidelines) and guidance for competent authorities (in Title 6.6 of the SREP guidelines). In particular, the removal of references to elements 3 and 4 of the CEBS GL 03 guidelines (which have been replaced by the EBA SREP guidelines) has necessitated some further **clarification in the IRRBB guidelines regarding the differentiation between Pillar 2 capital allocated for economic value risk, and capital buffers held against future variability of earnings (that could emerge under stress)**. These changes are intended to address misconceptions about the potential for double-counting risk and capital allocations.

The EBA recognises that supervisors will need to develop their own methodologies for evaluating IRRBB risks in institutions, and for ensuring that internal capital allocations are adequate – applying additional supervisory capital requirements if not. However, the IRRBB guidelines are focussed on expectations to institutions, and any further supervisory guidance on capital assessment should be included in an update to the guidelines.

6. *Cost-benefit analysis*

A number of respondents were concerned that the new guidelines could result in significant additional costs for institutions, and argued for a more comprehensive cost/benefit analysis ahead of adoption. Others accepted that the guidelines would result in a more comprehensive approach to IRRBB management by some institutions, but argued that a long period of adjustment should be allowed for these institutions to implement changes to their risk management systems, with proportionality applied particularly in the case of small and non-complex institutions.

Overall, the EBA maintains its position that the **IRRBB guidelines do not require any institution to do more than would be reasonable for sensible management of IRRBB, and that if significant changes of approach are required for some, the resultant costs would mainly result from previous failure to invest in appropriate control systems.** The incremental cost of implementing the guidelines would therefore have arisen anyway for these institutions, and the benefits of proper risk management should outweigh the cost. The draft guidelines contained clear statements about the importance of taking a proportional approach, based on scale and complexity, but these statements have been enhanced in the final version.

The EBA therefore considers it reasonable that the new Guidelines take effect from 1 January 2016 – which is also the effective date for the SREP Guidelines.

General comments			
In addition to providing feedback on the specific questions asked in the CP, a number of respondents provided more general feedback on the consultation proposals. Much of this general feedback related to issues covered by the CP questions (range of scenarios, definition of the standard supervisory shock, treatment of non-maturity liabilities, allocation of capital) and the comments have therefore been included above under the relevant question, together with the EBA response. However, other issues were raised that were not specifically covered by the CP questions. These issues are outlined below, together with the EBA response and intended action.			
Comments	Summary of responses received	EBA analysis	Amendments to the proposals
Overlap with work of Basel Committee on Banking Supervision (BCBS)	A number of respondents noted that BCBS has set up a task force to review options for the treatment of IRRBB within the capital regime for banks. In view of this, they argued that the EBA should delay finalising its guidelines until the outcome of the BCBS review is known. In particular, concerns were raised about the potential costs that could arise from serial implementation of new guidelines.	The EBA is a contributor to the BCBS work, and a number of the individuals involved in developing the EBA guidelines are also involved in the work of the BCBS task force, so the approaches are likely to be aligned, which will reduce duplicated implementation costs. The BCBS work is focussing in particular on options for calculating the supervisory capital allocation for IRRBB - an area where the EBA SREP Guidelines do not provide specific guidance. Any outcome of the BCBS work will not be fully implemented before 2019, which will give time for their implementation on future updates of the EBA guidelines. However, the work of the BCBS will be kept under review and any required updates to the EBA guidelines will be processed as seamlessly as possible.	No amendments to the proposals are needed, but the introduction references the BCBS work and the EBA will review the guidelines if changes are needed to respond to the BCBS work.
Implementation - timing and roll-out	Some respondents were concerned that implementation of the new guidelines could prove to require significant effort for some banks (depending upon their scale, complexity and age), and argued for a minimum 12-month implementation period plus some differentiation between what	The EBA does not accept that the guidelines will prove onerous to meet, bearing in mind that they explicitly reference the need for a proportional approach based on the institution's business model. The level of complexity for expected calculations (of the outcome of the supervisory standard shock) is quite low, with more sophisticated measurement	The final implementation date for the guidelines has been set as 31 December 2015.

	should be tackled in the short term and what could be treated as a longer-term objective. In particular, they argued that a smooth and orderly build-up to implementation would be more effective than a 'big bang' approach	approaches recommended only for institutions with more complex business models (which will tend to have the resources to undertake the work). In reality, many institutions will already be able to comply with the majority of the guidelines.	
Consolidation – scope of application	One respondent queried whether the guidelines should apply at entity or sub-entity level as well as at consolidated level. They argued that the level of application should be consistent with the level at which capital requirements are set, and at which IRRBB management is carried out. They also argued against applying the guidelines at sub-entity (e.g. branch level).	The EBA agrees that the guidelines should be applied at the same level or levels at which capital is allocated, and in line with actual risk management approaches. The Guidelines do not apply separately	Section 2 to the guidelines confirms the scope of application, including that it does not apply to branches.
Accounting framework implications	One respondent highlighted the interaction of the accounting approach adopted with IRRBB management, and stated that the prudential framework should not ignore the accounting framework within which it operates.	The EBA agrees that the accounting framework is a very relevant consideration, particularly when the objective of IRRBB management is to achieve reductions in income volatility. The draft technical guidance already contained a number of references to accounting treatment, stating specifically that governing bodies should be aware of the effects of accounting policies, but should not let the accounting treatment drive their risk management approach - the management of economic risks should be a priority, and the accounting impacts managed as a secondary consideration.	The importance of understanding and managing accounting effects (but secondary to economic effects) has been included in the introduction to the final guidelines, in addition to the references in the detailed guidance.
0% floor – use in standard shock calculations	One respondent was concerned that applying a floor of 0% to the change in interest rates under the standard shock might produce anomalous results for their particular business model (which involves	The EBA considers that it is appropriate for the standard shock to include a 0% floor on the level to which rates can fall under a -200 bp scenario, since interest rates are not normally negative and the margin impacts of the 'zero bound' can be	No change has been made to the guidance on the 0% floor, but the final guidelines do highlight the difference between the standard shock and that used by the

	<p>both fixed-rate savings and borrowing contracts). The respondent believed there would be a risk of inappropriate measures being taken to manage a 'risk' that would only be a product of the outlier calculation rather than an actual economic vulnerability. They therefore requested the option to ignore the 0% floor.</p>	<p>significant. The EBA recognises that under the specific circumstances of very low or negative rates, the result will be a non-parallel shift on the downward scenario. The aim of the new guidance is to achieve more comparability of approach across competent authorities when assessing IRRBB risk, so there is no scope to allow specific exceptions of the type requested. No other feedback suggests that the 0% floor is inappropriate. Therefore no changes should be made.</p> <p>The guidance on the 0% floor only applies to the standard shock, and the guidelines specifically state both that institutions should develop measures of IRRBB that are best suited to their individual business model and that competent authorities should seek to understand the effect of assumptions made in calculating the standard shock. There is no presumption of automatic action based solely on the standard shock result.</p>	<p>institution for internal management purposes.</p>
<p>Methodology for calculating the standard shock outcome.</p>	<p>Concerns were raised regarding the interaction between the expectations for sophistication of measurement tools (Table 3 in Annex B of the detailed guidance) and the calculation of the results of the standard shock. Institutions that could be regarded as 'sophisticated' do not necessarily measure EV risk using a 'dynamic rate-dependent economic value approach', which could be read as required by the draft guidelines. Building such a model purely for standard shock purposes would be time consuming and expensive, if not appropriate for its own internal management of IRRBB.</p>	<p>It was not the intention of the draft guidelines that the sophistication levels in Table 3 should drive the standard shock outcome. If different modelling techniques were used, the outcome would no longer be as comparable across institutions (undermining the purpose of the new guidance). Therefore the EBA agrees that the final guidelines should be clarified that the same (simple) calculation applies to all institutions.</p> <p>However, the guidance stands that for sophisticated firms, in their internal management of IRRBB, the simplest form of EV calculation used for the standard shock may not be appropriate and a more complex EV model could be appropriate.</p>	<p>The explanation of Table 3 in Annex B, and the guidance on calculating the standard shock in IRRBB 5, have been updated and clarified.</p>

Economic value and market value	Comments were made that the guidelines should differentiate between so called 'economic value' (which is a sum of discounted cash flows without spread and which is used for NII management) and 'market value' (which is a sum of discounted cash flows with spread and which is used for theoretical quantification of value of the bank).	The EBA agrees there is a distinction between the two measures, although both are essentially measures of economic value. However, the EBA thinks that when the term 'EV' is used in the Guidelines, it is sufficiently clear that the choice of overall measure to be used internally is for the institution to make.	The glossary has been updated to highlight the distinction between the two measures.
Breakdown of IRRBB into sub-components	One respondent was concerned that the guidelines would result in an 'unprecedented' 'requirement' to break down IRRBB into four risk sub-components (repricing, yield curve, basis, option). This was considered to be impractical for smaller banks, which might be expected to manage the risks in an 'implicit manner'. Clarification that the breakdown was a 'best practice' rather than mandatory solution was requested.	The EBA assumes that the comment relates to Table 2 in 'Section 4, 2.3. Methods for measuring interest rate risk' of the Guidelines. This is an explanatory table that is intended to help institutions to interpret the guidance on methods of measuring IRRBB. Different measures may be needed to pick up all the elements of IRRBB. The table is followed by guidance on proportionality of approach, and no 'requirements' are anywhere stated – only guidelines. The EBA believes that it is important for institutions to be aware of the different facets of IRRBB, since it is not evident that an 'implicit' approach would necessarily highlight material risks.	Minor changes have been made to the final guidelines to clarify the intention.
Practicalities of managing both EV and EaR simultaneously	One correspondent queried whether it would be possible for an institution to simultaneously manage both earnings and EV risks arising from IRRBB. Their contention was that the management of an institution would determine its approach, based on its business model, and could not	There is a balance to be achieved, because the two measures focus on different aspects of IRRBB but both are relevant to good risk management: The earnings measure necessarily highlights shorter-term profit volatility risks, whilst the EV measure highlights structural position risks beyond the period for which profit is forecast. Without using both	No changes have been made to the final guidelines.

	easily steer the business if trying to take account of different measures operating across different timescales.	measures, an institution could use very long-term fixed-rate positions to increase short term earnings, without understanding the longer-term opportunity costs and economic value risks associated with those positions. The EBA is aware that many institutions are already monitoring both risks to earnings and risks to economic value, and does not consider the practical issues arising to be especially problematic, even for smaller institutions	
Impact of the guidelines on the availability of fixed-rate loans to customers	A few respondents (and attendees at the public hearing) argued that the effect of the guidelines would be to discourage institutions from undertaking longer-term fixed-rate lending – particularly if competent authorities were to require additional capital for ‘outlier’ institutions that used fixed-rate loans to hedge against earnings volatility arising from equity and non-maturity deposits. They argued that the impact could be to increase the credit risk for lending, because the customers would be taking on interest rate risk (with variable rate loans) instead of the institutions.	The EBA does not accept that a change in the volume of fixed-rate lending is a necessary outcome of implementing the new guidelines. The final text of the guidelines explicitly states that the standard outlier test (which excludes equity capital) is for supervisory purposes only, and should not be used to manage the business. Competent authorities are also expected to understand the reasons behind any outlier cases, and specifically to consider the impact of earnings positions representing equity. In addition, the guidelines do not inhibit fixed rate lending – they just expect IRRBB positions arising from such lending to be measured and managed. For example, the risks can be offset by appropriate hedging strategies.	No changes have been made to the final guidelines.
Responses to specific questions in the Consultation Paper (EBA/CP/2013/23)			
Comments/Consultation Questions	Summary of responses received	EBA analysis	Amendments to the proposals

<p>Q1: Do you agree that the proposed changes to the original Guidelines text of IRRBB 1 are required in order to make clear that institutions' internal capital should be commensurate with the level of the interest rate risk in their banking books?</p>	<p>A large majority of respondents agreed that changes to the original guidelines text of principle IRRBB 1 were required, even though the main focus of IRRBB 1 will remain unchanged. One respondent noted that a reference to the original Basel guidelines was missing.</p>	<p>The EBA considers that references to the Basel guidelines can be achieved through footnotes rather than by duplicating text, and that IRRBB 1 should be further clarified so that it focuses only on the need for institutions to hold internal capital commensurate with their level of IRRBB.</p>	<p>IRRBB 1 has been simplified. The two appendices specifying the Basel guidance that were in the original and draft Guidelines have been deleted.</p>
<p>Q2: Do you agree that a more consistent approach to calculating the effect of the standard supervisory shock is necessary? Will the proposed changes to the text of IRRBB 5 achieve a more consistent approach?</p>	<p>Respondents predominantly welcomed the objective of achieving a more consistent and harmonised approach when applying the standard shock, agreeing that transparency and comparability were desirable goals. However, some concerns were raised about whether the proposed calculation would end up as a 'one size fits all' approach, with excessive emphasis on comparability to the potential detriment of understanding actual risk sensitivity. The changes to IRRBB 5 (simplifying the measure to just a +/- 200bp parallel shock) were viewed positively as a means of achieving a level playing field between institutions.</p>	<p>The EBA is aware of the inherent limits of a standardised approach, especially when used to measure a complex risk such as IRRBB. However, the EBA believes that a more consistent approach to measuring interest rate risk is needed to comply with Article 98 of CRD 4, and to provide a basis for comparing institutions. Achieving this level of consistency means making some compromises in setting harmonised assumptions for the standard calculation, but the guidelines are clear that the outcome of the calculation is just the starting point for discussion with the institution, rather than an accurate reflection of underlying risks. In response to the concerns raised during the consultation, the EBA will make it clear that these harmonised assumptions only apply for computation of the standard shock and should not be relied upon for internal risk management purposes.</p>	<p>New wording for IRRBB 5 has been included to emphasise that the prescribed assumptions and measurement requirements apply solely for the purpose of computing the outcome of the standard shock for supervisory purposes, and are not intended to supplant institutions' own assumptions and calculation methodologies used for internal management purposes.</p>
<p>Q3: Do you agree that an average duration of 5 years is appropriate for the behavioural assumption for non-maturity liabilities when calculating the effects of the standard shock. If</p>	<p>Many respondents maintained that it was not appropriate to specify a single 'one-size fit all' assumption for the average duration of non-maturity deposits; the assumed duration was stated to differ significantly from one country to another, and between</p>	<p>The EBA recognises that it is not generally possible to define 'a priori' an average duration for non-maturity deposits that will accurately reflect heterogeneous jurisdictions and business models. However, if the standard shock is to produce more comparable numbers for competent authorities,</p>	<p>Amendments have been made to clarify the absence of any form of automatic read-across from the standard shock model to the methodology used internally by institutions.</p>

<p>not, what duration and/or measure would you suggest instead?</p> <p>Should the volatile portion be included in the average, or just the stable core?</p>	<p>different providers of retail banking services with a single country. Consequently the majority of respondents were strongly advised against defining a universal constraint on average duration for the following reasons.</p> <p>(1) Adopting a shorter duration is not necessarily less risky than adopting a longer duration as the variability of earnings will be higher.</p> <p>(2) A duration cap could adversely impact the treatment and internal management of interest rate risk positions (which might lead to incorrect prices of products and a distortion of the funding side of the credit business).</p> <p>(3) Even during the peaks of the recent crisis, there was no ‘deposit war’ between institutions belonging to the same financial system that caused a repricing of non-maturity liabilities.</p> <p>However, some respondents did accept that a specifying a maximum average duration of five years would be appropriate in order to obtain comparable results across the industry.</p> <p>Almost all respondents suggested that any cap on the duration of non-maturity liabilities should be limited to just the standard outlier test metric, without any direct and automatic consequences for their assessment of internal capital.</p> <p>There was very limited feedback on whether the cap should be limited to core deposits or should include the volatile</p>	<p>Some harmonisation is necessary and a maximum five-year average duration would be compatible with the approach seen to be used by many EU institutions. Without a cap on duration, the outcome of the supervisory shock calculation would be significantly skewed by embedded assumptions and the results would not be at all comparable. This would prevent the identification of outlier institutions (which was the main objective). Therefore, the cap needs to be retained.</p> <p>However, the average five-year restriction was not intended to apply to internal measures used by institutions to quantify their own interest rate risk. For such measures, a duration greater than an average of five years could be appropriate if the institution can demonstrate that it has accurately modelled its deposit repricing profile, and taken account of the economic value risk created by a longer earnings-related profile.</p> <p>In view of the lack of significant feedback on whether the cap should include the variable portion of non-maturity liabilities, the EBA concludes that the proposed wording is reasonable. No specific guidance is proposed for the duration that institutions should apply for internal measurement purposes – but the impact of this assumption on economic value risks will be a matter for full consideration by both institutions and their competent authorities.</p>	<p>Additionally, the final guidelines specifically state in IRRBB 5, that the five year average duration constraint, applies solely for the purpose of computing the outcome of the supervisory ‘standard shock’. Consequently, it is not intended to supplant institutions’ own assumptions and calculation methodologies. Competent authorities are encouraged (in Title 6 of the SREP guidelines) to understand the contribution of non-maturity deposit behaviouralisation beyond five years in reviewing the outcome of the shock.</p> <p>No change has been made to the draft text on core and volatile balances, so the overall average will be based on both elements.</p>
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	<p>portion, and no consensus emerged. Some respondents pointed out that including the volatile portion potentially makes the five-year cap less stringent, because the volatile balances will reduce the overall average duration.</p>		
<p>Q4: Should the calculation of the level of the economic value use a risk free yield curve that excludes instrument or entity specific credit risk spreads and/or liquidity risk, or should assets and liabilities be valued using an institution-specific credit risk curve? Should the calculation of the net interest income consider the change of the credit spread of assets and liabilities for the repricing of instruments that mature?</p>	<p>For EV risk calculation, the opinion of respondents was quite polarised between those favouring a risk-free curve and those who thought that each element of the calculation should be valued using a relevant credit curve. Most assumed (correctly) that the specific guidance on the choice of curve should apply just to the calculation of the supervisory standard shock, and argued for flexibility in the use of yield curves for internal risk management calculations. Those arguing for a single risk-free yield curve in the standard shock were in favour because of its simplicity and comparability, and because it isolates interest rate risks from other risks. Those in favour of entity and instrument-specific yield curves generally argued that these would produce a more accurate evaluation of EV risk.</p> <p>Views on choice of yield curves for evaluating earnings risk were similarly polarised between those arguing that forward projections of NII should take into account expected changes in credit spreads (including own spread) and those arguing that credit spread risks are different from pure interest rate risk. One respondent</p>	<p>Technically, there are good arguments for using instrument-specific curves, as these more closely reflect the actual earnings and spreads, but this approach is significantly more complicated and resource-intensive for institutions to maintain. Any guidance on the use of instrument-specific curves therefore needs to be proportionate to individual business scope and scale. Using a variety of different yield curves could make the computation of the mandatory standard shock considerably more time consuming, and would potentially reduce the comparability of calculations undertaken by different institutions. Therefore, the EBA believes that it would be preferable to define the calculation of the standard shock as using a single, risk-free yield curve, but to emphasise that institutions should consider whether to use instrument specific curves when performing their own internal calculations of economic sensitivity. Where the standard shock answer suggests that the institution might be an outlier, competent authorities will need to understand the calculation in more detail, and an alternate measure using more accurate yield curves would be useful in determining whether the risk is higher or lower than the standard shock indicates. Unlike with EV risk, earnings are generally quite sensitive to different yield curves and it therefore makes sense for institutions to use appropriate</p>	<p>The wording of IRRBB 5 has been amended to clearly state that the use of a single risk-free curve is required for the supervisory standard shock only. A new paragraph has also been added to the detailed guidelines suggesting that institutions should consider using instrument-specific curves for internal measurement purposes if proportionate. Amendments have also been made to the earnings at risk rows in Tables 1 and 3 (Annexes A and B) of the detailed guidance, to encourage use of instrument- and sector-specific forward rate assumptions in evaluating earnings risks, especially for more complex institutions.</p>

	<p>suggested that a new risk type should be defined relating to own credit spread (separate to interest rate and credit), which they called ‘refunding risk’. Overall, the majority view was in favour of factoring credit spread into NII projections, but not necessarily into EaR measures.</p>	<p>instrument-specific curves where the impact on earnings may be particularly significant. The proportionality principle applies.</p>	
<p>Q5: Do you agree that equity capital should be excluded from the calculation of the impact of the standard shock, when the results are used for supervisory purposes?</p>	<p>This issue proved to be highly contentious, with respondents almost equally split between those either strongly in favour or firmly opposed to the exclusion of equity capital.</p> <p>Those in favour of the exclusion of equity capital highlighted in particular the need for consistency and comparability in the outcome of the standard shock. Inclusion of maturity assumptions for equity capital would provide an opportunity for some institutions to disguise interest rate positions taken by matching them with equity, obscuring the ‘true’ IRRBB position. Others commented that the sensitivity of equity to IR movements should be the output of the calculation of the standard shock, and therefore equity itself could not be part of the calculation.</p> <p>Those in favour of including equity capital criticised the proposed exclusion as being particularly discriminatory for institutions pursuing a strategy of stabilising earnings from equity. They argued that exclusion could lead to an artificially high outcome from the shock calculation, as fixed-rate net</p>	<p>The EBA considers that equity capital should remain excluded from the computation of the standard shock since it is the change in the EVE that is being calculated. Leaving equity out avoids the confusion that could arise from having the outcome of the test compared with a number that is itself a factor in the calculation (the test measures change of EV as a proportion of capital, but if capital itself is included in the calculation, the methodology becomes circular).</p> <p>Moreover, accepting behaviouralisation of equity capital in the calculation would undermine its usefulness as a standard measure.</p> <p>The EBA is well aware of the impact of this assumption on standard shock results for institutions that operate earnings stabilisation programmes for free equity. However, competent authorities need to understand the EV risks that could arise from large positions taken to manage volatility of earnings, which might crystallise losses in the event of failure of the institution.</p> <p>As with other elements of the standard shock framework, the EBA recognises that institutions will not wish to use the supervisory measure for internal IRRBB monitoring purposes, and the EBA considers that competent authorities should consider the result of the calculation with and without inclusion</p>	<p>The final guidelines confirm in the revised IRRBB 5 that calculation of the impact of the standard shock should exclude equity. However, wording has been introduced in Title 6.6 of the SREP guidelines indicating that in reviewing the result of the standard shock calculation competent authorities should specifically seek to understand the impact of assumptions about the term of equity capital.</p>

	<p>asset positions representing equity would produce negative EV under a +200bp scenario, ignoring their contribution to managing EaR. Some respondents also noted that exclusion of equity would perversely penalise the best-capitalized banks, as the EV effect would be larger. Finally, some respondents pointed out a risk that the new Guidelines might encourage institutions to move away from fixed-rate lending to offer floating rates (or to reduce/securitise the supply of loans), which would transfer interest rate risk to customers (potentially increasing credit risk) and could have significant implications for the availability of certain loan products.</p>	<p>of equity, to put the outlier test into context.</p>	
<p>Q6: Do you agree that the original Guidelines should be amended to include a principle covering internal governance arrangements?</p>	<p>A large majority of respondents agreed with the inclusion of a new principle covering internal governance arrangements. Two respondents suggested that the amendment was unnecessary, as the topic has been already covered at a high level in other EBA/CEBS Guidelines.</p>	<p>While acknowledging the opinions of all the respondents, EBA considers it useful to include a high-level guideline covering internal governance arrangements in the Guidelines that links to the more specific guidance on systems and controls included in the detailed Guidelines.</p>	<p>In line with the consultation proposals, the original guidelines have been amended to include a new high-level guideline (IRRBB 4.1), covering internal governance arrangements.</p>
<p>Q7: Is the provision of additional technical guidance, to be read alongside the original Guidelines (as updated), helpful in highlighting the key issues to be considered by both institutions and competent authorities?</p>	<p>The provision of additional technical guidance was widely welcomed. A strong majority was in favour of the additional guidance being read alongside and incorporated into the revised guidelines.</p>	<p>The EBA is pleased that the new detailed guidance is generally supported.</p>	<p>The detailed guidance has been incorporated into Section 4 of the guidelines.</p>

<p>Q8: Should the Technical Guidance remain a separate document, or should it be embedded within the overall Guidelines?</p>	<p>Respondents expressed a general preference for the technical guidance to be embedded/incorporated within the overall Guidelines, but commented that user-friendliness was more important than anything.</p>	<p>Since the technical guidance covers multiple high-level guidelines simultaneously, it is not possible to fully embed it in the new guidelines. However, both can be included in the same overall document.</p>	<p>The detailed Guidance has been included under Section 4, 2 of the guidelines</p>
<p>Q9: Do you agree that institutions should regularly measure their IRRBB exposure under an appropriate range of different interest rate scenarios, not just comprising standard shocks based on sudden parallel shifts of the yield curve?</p>	<p>A large majority of respondents agreed that multiple IR scenarios should be used in stress testing. However, some of the respondents called for the inclusion of a proportionality principle, or for leaving the range of scenarios used to the discretion of individual institutions. Only one institution considered the guidance to be too prescriptive and argued against any additional guidance on internal stress testing.</p> <p>Regarding the frequency issue, no consensus emerged on how regularly the scenarios should be run, with answers ranging from weekly to quarterly.</p>	<p>The EBA perceived some confusion in the responses relating to the guidance on the standard shock and that on more general stress testing. Some explicit clarification should therefore be provided to confirm that the outcome of the standard shock outlier test is based solely on a +/-200bp parallel shift, and that the additional stress scenarios are expected to be used only for internal stress testing purposes.</p> <p>Regarding the issue of frequency, the EBA considers that some consistency of the wording with the CEBS Guidelines on stress testing (GL 32) would be appropriate.</p>	<p>New wording has been included in the background and rationale to the updated guidelines, and in IRRBB 5, explaining that the guidance on computing the outcome of the standard shock applies for supervisory purposes only, and that it is not intended to supplant institutions' own assumptions and calculation methodologies used for internal risk management purposes.</p> <p>A new paragraph has also been included cross-referring to CEBS GL 32 (on stress testing) and also confirming that scenario analysis should be undertaken proportionately to the nature, scale and complexity of the business. Section 4, 2.1. on scenarios and stress testing of the guidelines now also contains a paragraph indicating that the minimum frequency of stress testing should be quarterly, and should increase in times of stress.</p>

<p>Q10: Should stress testing for IRRBB be integrated into the institution's overall stress testing structures and programmes?</p>	<p>A large majority of respondents agreed that IRRBB should not be analysed in isolation and that correlations between IRRBB and other risks (such as credit, liquidity and market risks) should be explored. However, a few responses mentioned a risk of increasing the complexity of stress testing.</p>	<p>The EBA believes that stress testing for IRRBB should be integrated into the overall stress testing program of an institution, but recognises this can sometimes be complex to achieve.</p>	<p>The detailed guidelines have been amended to state that IRRBB should <i>normally</i> be included in the overall stress testing program.</p>
<p>Q11: Do you agree that key behavioural assumptions affecting accounts with embedded customer optionality should be subject to regular review and testing to ensure that they remain valid?</p>	<p>Almost all respondents agreed that all behavioural components should be reviewed and tested regularly, as part of a structured back-testing framework; the implementation of objective and independent validation was seen as an important step to verify the appropriateness of all assumptions, explicit and implicit. Several of the trade bodies commented that implementation of this validation process could be difficult and labour intensive.</p>	<p>The EBA is pleased that the industry supports its point of view.</p>	<p>No amendments to the guidelines were deemed necessary. It should also be noted that the proportionality principle is explained clearly in Section 4, 1 of the guidelines.</p>
<p>Q12: Do you agree that behavioural assumptions about the re-pricing characteristics of customer accounts without specific re-pricing dates should be prudent and appropriate in balancing the benefits to longer-term earnings against the economic value at risk?</p>	<p>Respondents agreed that the assumptions should be 'prudent', but noted that prudence was difficult to determine in the context of IRRBB risk —adopting a shorter re-pricing profile could be as risky, or even more risky than adopting one that is too long. All respondents accepted that the profile should be based on robust statistical modelling with appropriate testing of assumptions. Some queried the concept of balancing earnings risks against economic value risks, arguing that non-maturity liabilities behaved as fixed-rate items, so hedging them managed risk rather than</p>	<p>The EBA agrees that what is prudent will depend on the specific circumstances of the institution, but nevertheless considers that even if it can be shown that the behaviour of non-maturity liabilities is historically extremely stable, locking in a long-term position does carry risks that future developments may not mirror past experience. For example, markets might become more competitive (e.g. with new players such as telecommunication companies, internet businesses), the bank could suffer a loss of confidence from its customers, and legislation or tax changes could affect product volumes. In the end, these are not pure fixed-rate products, since the behavioural maturity assumed will be much longer</p>	<p>No changes have been made to the text in the final guidelines. The guidance to competent authorities to review the prudence of behavioural assumptions has been included in Title 6.6 of the SREP guidelines.</p>

	creating risk.	than the contractual maturity. The longer the behavioural duration that is adopted for them, the greater the scope for the behavioural model to be proved wrong and the longer the potential period of EV adjustment or relative earnings risk. For these reasons, the EBA considers that both institutions and their competent authorities should pay close attention to the risk trade-off that behaviouralisation of non-maturity liabilities implies.	
Q13: Do you agree that assumptions for the investment term of equity capital should be fully recorded and considered as part of the institution's corporate planning cycle (rather than as a tactical decision in reaction to changes in market rates)? Is further guidance needed on calculating the investment term of equity?	A large majority of respondents believed that a bank's assumptions for the investment term of its equity capital should be set as a strategic decision and well documented as part of the corporate planning cycle. Moreover, they agreed that assumptions should not generally be changed to benefit from favourable interest rate movements (so accepting these are long term strategic assumptions rather than an opportunistic tactical assumptions). One respondent commented that changes to assumptions could be appropriate when interest rates for reinvestment were extremely low. Respondents were concerned that any introduction of detailed guidance on investment term would risk imposing a 'one-size fit all' approach rather than linking the assumptions to the bank's own business model and corporate plan. All respondents said that no further guidance was needed.	The EBA agrees that no further guidance is needed for setting the investment term of equity.	No amendments to the text of the guidelines were deemed to be necessary.

Q14: Do you agree that institutions should monitor both risk to earnings and risk to economic value?	Respondents generally agreed that both metrics should be used, although some favoured one over the other (but not consistently). Most banks believed that the importance of each metric in internal IRRBB management would vary by institution, and they suggested that the balance between the two metrics should be decided internally. A very small minority of banks would incur costs in introducing a new metric, and these banks are not certain whether the benefits of the additional metric will outweigh the cost.	The EBA believes that banks should measure for both earnings and value volatility, and notes the general industry support for this position. The EBA accepts that the guidance could state more clearly that, for internal management purposes, institutions should make their own decision the relative significance of earnings-based or value-based measures.	Additional explanation has been added in section 4, 2.3 of the final guidelines on 'methods for measuring interest rate risk'.
Q15: Do you agree that institutions should use a variety of risk measures to ensure better coverage of embedded risks?	Respondents generally agreed that having a variety of risk measures was both useful and important, but they stressed that the number of measures should be proportionate to the scale of the business.	The EBA agrees that the number of measures should be proportionate.	Section 4, 1 of the final guidelines contains additional wording recognising the importance of proportionality.
Q16: Do you agree with the guidance matching measures with different levels of sophistication in Table 3?	Most of the respondents who commented thought that guidance was helpful as long as it was indicative rather than mandatory. Some respondents queried whether the grading of approaches by sophistication was correct, arguing that a simple, well-implemented measure could be better than a sophisticated, but poorly-executed sophisticated measure. A minority believed that more detailed guidance on expectations could be useful.	The intention of the guidance was not to make Table 3 mandatory. The EBA recognises that further clarification of the purpose of Table 3, and of how institutions are matched to different sophistication levels, would be useful. The EBA also agrees that the differentiation between complexity and sophistication needs further clarification.	The final guidelines include in Annex B to Section 4, 2 a redrafted Table 3 and additional guidance on sophistication.
Q17: Do you agree that there should be additional guidance provided on aspects of internal	The majority of respondents agreed that the additional guidance provided on aspects of internal governance specific to IRRBB was	The EBA welcomes the majority view of the industry that the additional guidance on aspects of internal governance is useful.	Guidance on governance has been included in IRRBB 4.1 and in Section 4, 2.4 of the final

governance specific to IRRBB?	helpful, with some seeking further clarification on the level of internal governance that would satisfy regulators. Two respondents thought that additional guidance was unnecessary.		guidelines
Q18: Do you agree that the main governance issues for IRRBB relate to overall IRRBB strategy, risk policies, processes and controls, IRRBB IT systems and data quality, and internal reporting?	All but one respondent agreed with the statement. That single respondent thought than any additional guidance was unnecessary and that the list was therefore redundant.	The EBA notes that the list of governance issues is considered to be sufficiently comprehensive.	Guidance on all of the specified governance issues has been included in IRRBB 4.1 and in Section 4, 2.4 of the final guidelines
Q19: Do you agree that it is helpful to distinguish between capital allocated for the potential IRRBB impact on economic value, and the implications for future capital requirements arising from changes to earnings resulting from interest rate risks?	<p>Eleven responses were received. Two partly agreed, six partly disagreed and three completely disagreed. Whether they agreed or disagreed, almost all respondents were concerned about the potential for double-counting in allocating internal capital for IRRBB risks.</p> <p>The majority thought that it would be essential to take into account a banks' individual IRRBB measures (EV vs. NII) and/or management approach (going concerns vs. gone concern) when allocating capital. One respondent suggested that the internal capital allocation should be sufficient to cover EV risk only, with risk to potential earnings reflected in stress testing outcomes. Another thought capital should cover EV risks on mark-to-market instruments, and earnings risks for accrual accounting items.</p> <p>Some respondents commented that the</p>	<p>The consultation responses demonstrate considerable concern amongst institutions about the implications of the new guidelines for capital. This is clear across the responses to questions 19 to 22.</p> <p>The key industry concerns are clearly that the new guidelines will result in doubling up of capital requirements for the same risk, and will result in an overall increase in capital held for IRRBB. The EBA is well aware that the management and mitigation of IRRBB is complex, and that holding capital may not always be the best mitigant. The guidelines are not prescriptive on the actual quantum of capital that should be held, nor on exactly how to assess the overall requirement. The regulatory concern is that IRRBB may sometimes be underestimated as a risk, and therefore the guidelines therefore specify a number of factors that should be taken into account – both by institutions and (through the SREP guidelines) by their competent authorities - in assessing whether any</p>	<p>In considering their response to the consultation feedback, task force members also took into account the experiences gained from on-going monitoring and on-site inspections in different countries.</p> <p>As a consequence of this, and of updates needed to place the guidance for competent authorities in the SREP guidelines, the 'Background and rationale' element of the Final Report set out the considerations informing the update of the guidelines.</p> <p>In particular, the amendments clarify that risks to economic value should be considered in the</p>

	<p>supervisory implications of the new guidance were not clear.</p>	<p>capital allocation is adequate.</p> <p>The EBA believes that the management of each institution should consider its risks in the context of the longer-term strategy of the business, including the implications for future profitability. In general, the expectation is that IRRBB, together with other material risks to the business, should be properly managed and residual risks mitigated by holding sufficient capital against them. Although EV and earnings risks arise from the same underlying source, they emerge over different timescales and according to different accounting treatments. The guidelines do not advocate any form of double-counting, but do suggest that institutions should consider capital allocations both in terms of EV risks (e.g. that might emerge through mark-to-market of saleable assets, or from crystallisation of earnings hedges) and earnings risks that could affect short term profitability under stress.</p> <p>Overall, the EBA believes that the guidelines are sufficiently balanced in their approach, and that no significant amendment is required. The current work by the BCBS on IRRBB may in due course result in clearer guidance on the actual level of capital that should be held. If so, the EBA Guidelines will be re-considered.</p> <p>The EBA accepts that some further explanation of the regulatory approach would be helpful and this has been included in the SREP Guidelines.</p>	<p>context of potential additional Pillar 2 capital, whereas risks to future earnings should be considered in the context of buffers held for stress testing and capital planning purposes.</p>
<p>Q20: Do you agree that the quantum of internal capital allocated against market risk positions in the banking book</p>	<p>In all, there were ten responses to the question, of which three agreed, one partly disagreed and six fully disagreed. Some respondents commented that the meaning</p>	<p>See the EBA analysis on Q18 for the general approach to capital allocation.</p> <p>The guidelines suggest only that one way of calculating a quantum of capital that may be</p>	<p>Since the guidelines are not prescriptive on this point, no amendment to the wording is needed.</p>

<p>should be gauged by considering other capital requirements for market risks?</p>	<p>and intention of the consultation question was not clear and asked for further supervisory guidance and/or explanations. Those banks that disagreed argued that:</p> <ul style="list-style-type: none"> (1) The banking book and trading book are different portfolios with different underlying intentions. (2) Different kind of market risks are managed and measured differently and (3) Internal capital allocation mechanisms should be consistent with how IRR is actually managed. <p>Respondents feared double-counting of IRRBB requirements when allocating internal capital.</p>	<p>appropriate for IRRBB would be to consider approaches taken to similar risks when held in a trading book. This would be particularly relevant for risk positions that could be transferred to a trading book (e.g. via internal swaps) rather than kept in the banking book. The EBA accepts that there is limited overlap between the trading and banking book.</p>	
<p>Q21: Do you agree that institutions should hold internal capital based on available limits rather than actual utilisation of those limits?</p>	<p>In all, there were ten responses, of which one partly disagreed and nine fully disagreed. Respondents argued that, were capital to be set against limits:</p> <ul style="list-style-type: none"> (1) links to actual positions might get overlooked; (2) the effectiveness of IRR management and risk management might be reduced (due to ineffective allocation of capital to underlying risks); (3) institutions might be encouraged to use their limits fully, which could increase the level of risks taken; (4) the results would be inconsistent in relation to internal governance and management of IRR; (5) the use of limits rather than actuals would be at odds with the approach for other elements of the capital regime. 	<p>See the EBA analysis on Q18 for the general approach to capital allocation. The EBA considers that, if limits are intended to be an expression of risk appetite (which is what respondents confirm), then the intention of the governing body is presumably that they could be used - a limit that is set well above intended levels of usage is not actually limiting anything. Since IRRBB is a Pillar 2 risk, there is normally no method for continuously adjusting capital requirements to match actual levels of exposure, so the capital allocation is based in the ICAAP on a point-in-time or average usage level that might not apply if any headroom in the limit were to be drawn down. In terms of the objections, the EBA considers that taking into account the extent of limits in allocating capital would actually lead to improved internal management by encouraging management bodies to set limits that are consistent with actual intended</p>	<p>Since the guidelines are not prescriptive on this point, no significant amendment to the wording is needed. However, the context wording has been adjusted slightly to reflect the use of limits as one input for capital allocation.</p>

	<p>In addition, respondents argued that allocating capital based on limits would be too conservative, since they were an expression of a bank's risk appetite rather than representing its actual risk. All respondents therefore advocated setting internal capital based on actual risk exposures.</p>	<p>usage, and by highlighting the capital costs of having large risk limits.</p> <p>In any case, the guidelines are not specific on how limits should be translated into capital allocations - the guidance is simply to take them into account.</p>	
<p>Q22: Do you agree that institutions should allocate internal capital against potential future earnings at risk, based on the result of their stress-testing?</p>	<p>In all, there were ten responses in total, of which one partly disagreed and nine fully disagreed.</p> <p>Those disagreeing argued that capital allocation should be consistent with the institution's ICAAP approach. These respondents were also concerned that a supervisory approach based on this approach would be too conservative. Most respondents, even those agreeing that capital should be allocated, were concerned about avoiding double-counting or even triple-counting of IRRBB (for EV, for Earning at Risk, for stress testing on Earnings at Risk) when allocating capital.</p> <p>The banks that agreed argued that capital should be based on the banks' individual stress tests.</p>	<p>See the EBA analysis on Q18 for the general approach to capital allocation and double-counting. The EBA agrees that the potential impact of IRRBB on future earnings should be gauged through stress testing, and that any capital allocation for earnings risk would therefore be within the context of capital held as a buffer against the outcome of stress testing. This is consistent with the wording in the draft guidelines, but the EBA agrees that some clarification would be helpful.</p>	<p>The guidelines are not prescriptive on the amount of capital to be held, but the final text has been adjusted slightly to clarify that earnings risks can be measured in the context of stress testing and internal capital allocated to buffers (which can be drawn down should the stress scenario materialise).</p>
<p>Q23: Are the cross-references between the High level Guidelines and the technical guidance helpful?</p>	<p>The majority of respondents thought that cross-references between the high level guidelines and the technical guidance were helpful.</p>	<p>The EBA notes that the industry is content with the cross-references. However, the re-wording of the original High-level Guidelines has simplified the relationship between high-level guidance and detailed guidance to a point where the table of cross-references has become superfluous.</p>	<p>The cross-references have been removed from the updated guidelines.</p>

<p>Q24: Does the glossary need to be extended to cover more technical terms? If so, please suggest additional terms and definitions.</p>	<p>The majority of respondents thought that the extent of the glossary was sufficient. However, more clarity on the definition of credit spread risk was desired.</p>	<p>The EBA welcomes the comments and agrees that more clarity on the definition of 'spread risk' would be helpful. The EBA also considers that a definition of 'non-maturity accounts' (liabilities/deposits) would be useful, in light of consultation questions and the coverage of these accounts in the guidelines.</p>	<p>The glossary has been expanded to include definitions of 'credit spread risk', 'non-maturity accounts' and 'market value of equity'. It is now included at the end of the background and context section.</p>
<p>Q25: Should credit spread risk (both the institution's own credit spread, and market spreads more generally) be treated as a form of basis risk to be factored into the measurement of IRRBB, and, if so, how should this best be achieved?</p>	<p>There was an almost unanimous view from respondents that credit spread risk is not a variant of basis risk, and should be treated as its own specific category of risk.</p>	<p>Respondents were clear that credit spread risk is separate from IRRBB, even if closely related. Rather than covering credit spread risk in detail in these guidelines, which would require a substantial redraft (and a further consultation), the EBA agrees it should be considered as a separate risk type and will determine separately whether further separate guidance may be needed. Given that the issue of credit spread risk is presently being considered by the Basel Committee, in the context of its own work on IRRBB, the EBA believes that it would be appropriate to defer a decision on further EBA work on the subject until the outcome of the Basel Committee discussions is known</p>	<p>A statement has been included in Section 2, Scope of application, confirming that credit spread risk is not specifically covered in the final guidelines, although it is closely related to IRRBB.</p>
<p>Q26: Do you agree with the main conclusions of the cost/benefit analysis / impact assessment? If not, please elaborate your opinion.</p>	<p>Five respondents agreed or mainly agreed with the CBA conclusions, and seven respondents disagreed (four strongly). Of the respondents who disagreed, some argued that an impact assessment could not be performed without finalising and testing the proposal for the new standard outlier test and others called for a detailed quantitative impact study.</p>	<p>The EBA view is that the institution-specific and overall benefits of a better management of IRRBB by introducing the guidelines clearly outweigh any costs that might arise. The EBA is not convinced that a full impact analysis would be a good use of time or resource (see comments on costs of measurement systems below).</p>	<p>The overall benefits of the new guidelines have been set out clearly in the background and context to the updated guidelines.</p>

<p>Q27: Do you agree that all institutions should be able to implement both economic value and earnings measures of IRRBB without significant additional cost? If no, please provide adequate reasoning and evidence.</p>	<p>There were 12 responses, of which three agreed, one was neutral, two partially disagreed and six wholly disagreed. Those respondents who agreed considered that most banks already had the ability to implement both measures relatively easily. Those respondents who disagreed thought that the level of management time and IT investment required to develop new measures would be significant, but some accepted that monitoring both measures made sense and that the investment would carry benefits. For these respondents, the key was to have a proportionate approach to the development of new measures and a sufficiently long implementation period (especially if the BCBS work also results in new measures).</p>	<p>The EBA view, based on supervisor feedback, is that implementing both economic value and earnings measures should not incur substantial costs for institutions provided that a proportionate approach is taken. Apart from the specification of the standard shock (which builds on a supervisory requirement that has been in existence for many years), the new guidelines only offer general guidance on the construction of value and earnings measures. For smaller institutions with limited resources, it would be possible to develop simple measures of risk without significant resources being required. Larger and more sophisticated banks generally already have sophisticated asset and liability management systems that allow both measures to be implemented. The EBA therefore believes that the overall costs will not be significant, and will be outweighed by the benefits of better risk management (which will reduce the costs associated with poor IRRBB management).</p>	<p>The benefits of implementing both economic value and earnings measures have been highlighted and explained more clearly in the background and context to the updated guidelines. IRRBB 2 has been amended to provide specific high-level guidance on the need to measure both.</p>
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Responses received in public consultations (public) for the draft Guidelines on Technical Aspects of the Management of Interest Rate Risk arising from non-trading activities.

1. European Association of Co-Operative banks (EACB)
2. Association for Financial Markets in Europe (AFME)
3. British Banker's Association (BBA)
4. BRE Bank S.A.
5. Bundesverband Deutscher Banken
6. Bank für Kirche und Caritas eG
7. Barclays plc
8. Building Societies Association (BSA)
9. Crédit Agricole
10. Czech Banking Association
11. Deutsche Bank (DB)
12. Dutch Banking Association
13. European Banking Federation (EBF)
14. European Federation of Building Societies (EFBS)
15. Fédération Bancaire Française (FBF)
16. German Banking Industry Committee
17. Japanese Bankers Association
18. Prometeia

In addition, one confidential response was submitted.

4.4 Cost-benefit analysis / impact assessment

Introduction

This chapter outlines the assessment of the impact of the guidelines concerning the technical aspects of the management of interest rate risk arising from non-trading activities. Article 16(2) of the EBA Regulation requires that guidelines be accompanied, where appropriate, by an analysis of the related potential costs and benefits, producing an impact assessment.

The objectives of the amendments and additions to the original guidelines are to improve the management of IRRBB by EEA institutions, by setting out good risk management practice and by guiding institutions towards improved approaches where they currently fall short.

The guidelines (both original and as amended) contain no mandatory requirements for institutions, but the EBA would expect institutions to benchmark their current practices against the recommended practice to establish whether there are any significant gaps to be addressed. If gaps are identified, the institution, prompted by its supervisor if necessary, would be expected to consider whether its existing approach is adequate given the market and business model idiosyncrasies of the institution. A post-implementation review of the guidelines is envisaged (the aim will be to perform this review approximately one year after implementation) and peer review work may be undertaken by competent authorities to establish how the guidelines have been implemented nationally.

The costs incurred by institutions for any changes resulting from the implementation of the guidelines are therefore expected to be almost entirely attributable to the implementation of improvements to their institutional management of IRRBB. Some overhead are expected to be incurred in understanding the content of the guidelines and assessing their relevance to the institution, but these costs will be minimal. The costs of any improvements of IRRBB risk management are therefore expected to be costs that are already incurred by a well-run institution in the normal course of business, and these are expected to be more than outweighed by the benefits of both improved risk understanding and mitigation of risk (which will reduce the incidence of unexpected losses).

No alternative regulatory options were considered to be appropriate – the Directive does not require the implementation of binding technical standards for IRRBB, and the need for judgement in managing the impact of IRRBB means that rules would potentially be too rigid (or even counter-productive). Similarly, leaving the original Guidelines unchanged would not achieve the supervisory objectives specified above.

Update of High-level Guidelines

The Consultation Paper (CP) proposed that the Principles (IRRBB 1 – IRRB 9) in the original guidelines should be left unchanged, except for some minor changes to IRRBB 1 and the introduction of a new high-level guideline (IRRBB 4.1) on Governance. However, the EBA's work

on implementing common standards for performing an SREP resulted in the removal of a number of the original Principles (IRRBB 6- 9) that related to supervisors. These principles are now included within the remit of the new SREP guidelines. Further review of the remaining Principles indicated that they would benefit from some re-wording and explanation, in line with current EBA standards for guidelines, to improve clarity and remove duplication with one other and the new detailed guidelines. As a result, the six remaining High-level guidelines (plus the new High-level guidelines on governance) have all been amended. However, none of the changes fundamentally alter the nature or content of the overall guidance that was included in the CP, taking into account the proposed detailed guidance and the separation of elements addressed to supervisors.

Guidance on the calculation of the supervisory ‘standard shock’ (IRRBB 5)

The ‘standard shock’ specified in Article 98(5) of Directive 2013/36/EU is intended to prompt supervisory action where the level of IRRBB is potentially of a scale that could affect the safety and soundness of an institution. Its aim is therefore not only to safeguard the financial stability and enhance the resilience of the banking sector but also to improve consumers’ confidence in the resilience of banks’.

In reviewing the guidelines, it became clear that the original Guidelines had led to differences in interpretation that made comparing the standard shocks across institutions and supervisory authorities more difficult, and which could lead to inconsistent outcomes. As a result, consideration was given to ways in which the guidance could be made more explicit, and the CP proposed a clearer definition of how the supervisory standard shock should be calculated and used by competent authorities. These proposals have been formalised and included in an updated version of IRRBB 5 in the High-level Guidelines.

Two important clarifications have been included with respect to the exclusion of capital from the calculation, and a constraint on behavioural adjustments for customer balances (liabilities) without a specific repricing date up to a maximum average of five years.

A third element is the specification of the extent of movement in the yield curve that should be deemed to represent a standard market shock under which IRRBB should be measured. The original guidelines (in IRRBB 5 as it was previously worded) gave as an example a sudden parallel shock to the yield curve based on the 1st and 99th percentile of observed interest rates over the last five years: At the time the original Guidelines were drafted this equated to approximately +/- 200 basis points and the text therefore referred mainly to the + - 200 basis point test.

To improve the updated Guidelines, two options were considered for the shift of the yield curve for stress testing purposes: (a) formalising the test as precisely a sudden parallel shift of +/- 200 basis points (applying a 0% floor) and (b) explicitly stating that the shift should be based on the 1st and 99th percentile of observed interest rates over the last five years (i.e. providing this as guidance rather than as an example)

The latter option retains the advantage of adjusting the shift of the yield curve according to the prevailing economic conditions. However, in times of low observed interest rate volatility, this guidance may lead to a standard shock that is insufficient for stress testing purposes. Moreover, it may also lead to different standard shocks being imposed by different competent authorities in different jurisdictions, something that would not promote comparability of calculation or convergence of outcomes - a key objective of the updated guidance.

On the other hand, the former option, i.e. +/- 200 basis points sudden parallel shift, would allow more consistent comparisons across institutions and across supervisory jurisdictions, and is sufficiently conservative for stress testing exercises during normal market and economic conditions. However, during stressed market and economic conditions, the real changes in interest rates may frequently exceed this level in certain jurisdictions.

Considering the pros and cons of the aforementioned options, the sudden parallel shift of +/- 200 basis points has been adopted as the general rule (in line with Article 98(5) of the Directive 2013/36/EU), and included in a revised version of IRRBB 5 as the standard stress. Reference to the 1st and 99th percentile of observed one-day interest rate changes over a five year period scaled up to a 240-day year has been retained to apply under high interest rate conditions, but with a floor of +/-200 basis points. The intention is that the EBA should periodically review the continuing appropriateness of this level of shift as the basis for a common standard shock.

The costs of implementing and complying with the amended guidelines are expected to be low, as most of the larger institutions are already able to model such stress scenarios, while the smaller institutions would normally be in a position to adjust their existing IT systems to comply with the new standard shock without significant expense (and setting a stable standard shock level for general purposes will reduce the frequency of adjustments to react to changes in market observed rates).

High-level Guidance on internal governance arrangements

The original Guidelines did not include specific guidance on the need for robust internal governance and controls, in part because the general, overarching need for robust systems and controls was covered elsewhere in EBA guidance¹⁴. Two options were considered to deal with the lack of guidance on internal governance arrangements for IRRBB: (a) to follow the Basel Committee's specific guidance for managing IRRBB (Principles 1 to 3 and 10) or (b) to establish new guidance.

The option of establishing new guidance was deemed likely to be time-consuming, and in any case was not considered likely to result in guidance different to that established by the Basel Committee. It is recognised that the principles and guidance from the Basel Committee have not yet been updated to reflect the lessons learnt from the recent market crisis, but they are still considered to be appropriate for the governance of IRRBB and, if they are subsequently revised,

¹⁴ in particular in the EBA's Guidelines on Internal Governance (GL 44)

the revisions can be integrated into the EBA's guidelines. Option (a) has therefore been adopted, but with some guidance that specifically relates to IRRRB included (a new high-level guideline (IRRBB 4.1, and part 4 of the detailed guidance). There are no significant cost implications for institutions as the new guidance reflects existing good practice.

Quantitative tools and models for assessing IRRBB

The EBA has observed that, in practice, credit institutions apply a wide range of tools and models to assess their interest rate risk. These tools and models focus on two different measures of interest rate risk: (a) earnings measures and (b) economic values measures. Within each category there are static and dynamic models. According to existing literature and empirical evidence, dynamic models tend to be more complete than the static models since they cover all the IRRBB risk types (re-pricing risk, yield curve risk, basis risk and especially option risk) on a forward-looking basis - which is particularly important in estimating earnings effects. However, the implementation of dynamic models in small credit institutions could pose a non-proportional cost and burden compared to the benefits resulting from the improved identification and measurement of risk.

To ensure that the principle of proportionality is respected, the revised guidance is that credit institutions should, at a minimum, model both economic value and earnings on a static basis, but that larger and more sophisticated institutions should be encouraged to use more complex and dynamic models, commensurate with the complexity of their business and the level of IRRBB that is inherent in the business model. The new guidance is intended to ensure that such models are subject to proper governance, have been properly specified and tested, and are updated in line with market developments and practice. The guidance does not require a supervisory approval process for such models, but does seek to ensure that competent authorities are fully aware of the implications of these models, and that they are able to challenge as appropriate where the outcome is inadequate or unsafe.

It is possible that some (mainly smaller) institutions do not currently measure both economic value and earnings risk - especially as the standard supervisory shock essentially measures only economic value risk. However, it is considered very important that both the governing bodies of institutions, and their competent authorities, should have a proper understanding of both risk measures, since management of IRRBB can involve balancing the impact of the two risk aspects (which tend to work in contention with one other). Institutions may incur additional costs in adapting their existing risk measurement systems to measure EaR as well as economic value at risk, but these costs are not expected to be significant, and the benefits of increased risk awareness are expected to be substantial.