Committee of European Banking Supervisors

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Technical aspects of stress testing under the supervisory review process – CP 12

I. Executive summary

1. This paper contains guidelines that reflect a common understanding among European supervisory authorities on the stress testing processes to be used by institutions under the Capital Requirements Directive (CRD)[1] with respect to Pillar 2 provisions. As reviewing Pillar 1 risks is part of the supervisory review process, this paper reflects also interactions with relevant provisions regarding Pillar 1.

2. The guidelines elaborate on CRD requirements with respect to stress testing in terms of risk management and for the assessment of capital adequacy. They aim to provide some clarification in relation to stress testing as part of CEBS's guidelines on the application of the supervisory review process (SRP). Accordingly, they will be implemented as part of the SREP/ICAAP dialogue and should not be interpreted as resulting in automatic capital add-ons (see ST 14).

3. The concept of proportionality, laid down in CRD provisions related to Pillar 2 and underlined in the introductory statements of CEBS's guidelines on the application of the supervisory review process, applies also to stress testing, the complexity of which will be expected to be related to the size of the institutions as well as to the sophistication and diversification of their activities.

4. The guidelines describe objectives and desired outcomes. CEBS recognises that Stress testing is primarily an internal instrument of the institutions. Earnings are a part of an institution's overall capital planning and are the first line of defence to absorb losses. Therefore, institutions should consider, in the context of their internal capital adequacy assessment process –ICAAP- assessing how their earnings are affected by stress situations.

5. CEBS also acknowledges that institutions currently are on different points of a continuum. There is no single 'correct' stress testing methodology or procedure. What is adequate for an individual institution depends very much on proportionality and the development of its practices over time. An important part of the supervisors' assessment of stress testing will therefore be based on an on-going dialogue with institutions.

6. Since evolving industry practices and the practical application of these guidelines will enlarge supervisors' experience, they will be subject to maintenance following implementation of the CRD, when and where necessary.

7. These guidelines are drafted as guidance to supervisors, elaborating further on the guidance given by CEBS in other Guidelines. However, since the guidelines express CEBS's expectations of how national supervisory authorities should deal with the stress testing of institutions, they clearly also affect the institutions that use these approaches.

8. In interpreting the guidelines, institutions have to distinguish between

[1] Except where noted otherwise, all references to Articles of the CRD are references to Directive 2006/48/EC.

several types of cases. In cases where the guidelines reflect a common understanding among national supervisors on what they should expect from their institutions, the text discusses what institutions "should" do. In cases where the terms "could," "may" etc. are used the guidelines simply provide illustrative examples, meaning that institutions are free to use other solutions. . The term "should consider" gives institutions the possibility of not applying a suggested action if they think it is not adequate for their purposes without the necessity to explain in detail why they haven't done so. In cases where the CRD is quoted, the text of these guidelines uses "shall."

9. 'Stress testing' as used in these guidelines is a generic term for describing the various techniques (quantitative and/or qualitative) used by institutions to gauge their vulnerability to exceptional but plausible events. Supervisors consider it important for institutions to embed stress testing into their risk management framework. In that respect, the revised Capital Requirements Directive (CRD) contains requirements with regard to stress testing in terms of risk management and for the assessment of capital adequacy.

10. CEBS Guidelines on the application of the supervisory review process (SRP) also refer to stress testing at several points: in particular, within ICAAP, it is expected that some form of stress testing will be part of internal capital planning. In this context, this paper aims to provide some clarification and guidance on stress testing as part of the CEBS's work related to the SRP. Its objective is threefold:

- to present the full range of stress tests under the CRD – see Annex 2 - determining the elements of stress testing under the SRP and mapping, where necessary, the inter-relationship between stress testing under Pillar 1 and Pillar 2 (notwithstanding the principle of proportionality, some areas address all institutions, whereas others refer only, e.g., to institutions using IRB approaches under Pillar 1),

- where appropriate to provide additional guidance on the performance of sound stress testing by institutions in each of the above areas. In doing so, existing industry practices have been taken into account. While most large, complex institutions already have stress testing arrangements in place, on the whole, the use of a broad range of stress tests as a complement to existing risk management tools is currently not widespread. In general terms, the stress testing of market risk is at a somewhat more advanced stage than those for other kinds of risk (e.g. credit or liquidity risk). In contrast, some small institutions have no stress testing arrangements at all. Given this and the new CRD requirements, the development of guidance, in particular for credit and liquidity risk and for group-wide tests is both necessary and desirable.

- to specify criteria/methodologies for European supervisors to use to review the suitability of stress testing performed by their institutions under the Pillar 2 process.

11. The remainder of the paper is set out in three sections:

- Section II explains what is meant by stress testing and outlines the range of its different uses under Pillar 2,

- Section III provides some general guidelines for both institutions and supervisors on the methodology of sound stress testing, and

- Section IV provides an overview of stress testing by risk categories; it maps, where necessary, the inter-relationship between stress testing under Pillar 1 and Pillar 2; and elaborates, where necessary, additional guidelines for implementation.

12. These guidelines went through a four-month public consultation period and were also discussed in several meetings with industry experts before being endorsed by CEBS. The comments received from the industry have been published on the CEBS website. CEBS feedback on the industry responses received has been published in a separate document (see www.c-ebs.org)

II. Definition and uses of stress testing

II.1. Definition

13. As defined by the BIS[2], stress testing is a risk management technique used to evaluate the potential effects on an institution's financial condition of a specific event and/or movement in a set of financial variables. The traditional focus of stress testing relates to exceptional but plausible events.

14. The level of complexity of stress testing is expected to vary with the size and level of sophistication of institutions. This principle of proportionality is further detailed in section III.1

II.2 Types of stress testing

15. There are a number of other categorisations and concepts currently used by the market or the supervisors. In the context of the ICAAP, stress testing could generally fall within the two following categories and concepts described in paragraph 16: scenario tests and sensitivity analyses. Although for the purposes of this paper the categorisation and concepts introduced in paragraphs 16 seemed to be the most helpful[3], they are only indicative and do not restrict institutions from using their own categorisations and concepts, as long as these approaches meet supervisory expectations.

16. Sensitivity analyses are generally less complex to carry out since they assess the impact on an institution's financial condition of a move in one particular risk driver, the source of the shock not being identified, whereas scenario tests tend to consider the impact of simultaneous moves in a number of risk drivers, the stress event being well-defined. For instance, a typical sensitivity analysis would be to assess the impact on an institution's profitability should interest rates fall sharply in one day. In contrast, a

2 Committee of the global financial system, January 2005: Stress testing by large financial institutions: survey results and practice.

[3] For example, the term "scenario tests" and the way this is defined, avoids confusion with the term "scenario analysis" which has a different meaning in the context of Operational risk

scenario test would consider the impact of, for instance, a 'Black Monday'-like event on an institution's profit and loss account. Such a scenario takes into account a combination of changes in different risk drivers being affected by the stress event chosen by the institution.

II.3 Uses of stress testing

17. In practice, stress testing is a valuable risk management technique whose potential applications are quite varied within each individual institution. In the context of internal capital assessment under Pillar 2 institutions should consider stress testing for the following purposes:

- As a diagnostic tool to improve the institution's understanding of its risk profile.

- As a forward looking tool within the ICAAP.

    - Earnings are a part of an institution's overall capital planning and are the first line of defence to absorb losses. Therefore, institutions should consider, in the context of their ICAAP, assessing how their earnings are affected by stress situations.

    - Stress testing may be used to assess the adequacy of internal capital. For example, this can be relevant for smaller institutions that may want to tackle their ICAAP through a series of very simple relevant stress tests to inform their view of the adequacy of their internal capital,

    - For institutions using internal capital models, stress testing could be used to supplement statistical methodologies (such as VaR). Stress testing helps form an alternative view where paucity of historical data limits the predictive power of such models.

    - In line with one of the CEBS Principles listed in the CEBS Guidelines on the Supervisory Review Process (ICAAP 8) institutions should use stress testing as one tool to assess the risks in a forward looking manner. It will then be possible for institutions to compare the outcome of those stress tests against their business plan and take the necessary measures in the light of these results

III. Main guidelines underpinning sound stress testing by institutions

18. This section sets out guidelines applicable to any stress testing, irrespective to its use in the context of internal capital setting and assessment, as well as to the risk drivers inherent in the process. These main guidelines are meant to ensure that stress testing is actually an integral element of the institution's risk management framework. The guidelines for Pillar 2 stress testing set out in section III of this paper in principle also hold true for credit and market risk stress testing but do not override any specific provisions of the CRD.

19. Notwithstanding principle ST9, supervisors should in general not prescribe specific scenarios or specific methodologies for the choice or application of scenarios.

III.1. Relevance depending on the size and sophistication of institutions

ST1. The Guidelines on stress testing will be applied to all institutions taking into account their size, sophistication and diversification.

20. As a general rule, sophisticated institutions should use a combination of both scenario tests and sensitivity analysis (or any other appropriate concept) whereas less complex institutions may develop a less technically demanding approach. In that respect:

- Scenarios with greater coverage across product lines or geographical regions, and considering secondary effects, may be rather employed by large and complex institutions.

- Less complex institutions may rather confine themselves, considering their risk profile, to simple sensitivity tests run relatively quickly and used by the management body to form a view of the impact of a given variable, or a set of a small number of variables, on the financial condition of the institution under exceptional but plausible adverse movements. This simple measure may already be sufficient for the purpose of ICAAP.

- Stress testing would in particular be required from institutions with a trading book risk profile irrespective of their size. Stress testing should be calibrated considering the greater complexity of their business activities (e.g. option trading and other non-linear products), taking account, for instance, of volatility.

III.2. Stress testing coverage

ST2. In line with one of the principles listed in the CEBS Guidelines on the Supervisory Review Process (ICAAP 7) institutions should identify their material risks. In general, institutions should conduct adequate and proportionate stress tests on all the risks they have identified as material.

21. Notwithstanding legislative requirements, any stress testing process should start with the institution's own assessment of possible specific vulnerabilities. The main areas which institutions have considerable exposure to (e.g. where they are an active market maker) should be the ones most thoroughly captured under a stress testing framework (see paragraph 88). Institutions should thus determine all material risks that can be subject to stress testing.

22. In line with ICAAP 7, the identification of material risks could stem from:

- A comprehensive review by institutions of the nature and composition of their portfolios. The separation of risk management functions, such as between trading, credit and treasury functions, should not prevent institutions from identifying material factors across business lines that should be incorporated into the stress testing framework for the group.

- A review of the external environment in which institutions are operating with a view to assessing the extent that this could affect their financial condition. To this end, institutions may consider data specific to industries or sectors, macro-economic variables which could affect for instance obligors' ratings, or data related to a specific country or region.

III.3. Stress testing calibration

ST3. Based upon the identification of material risks, institutions should derive material risk drivers that should be subject to stress testing.

23. The identification of appropriate risk drivers is crucial to ensure the adequacy of the whole stress testing process. For reporting purposes, in particular, it is essential that any stress test is characterized by a clearly identifiable set of stressed risk drivers, so as to provide useful information giving rise, if necessary, to concrete and adequate action.

24. Institutions should first identify their points of vulnerability in order to stress the relevant risk drivers that may affect their earnings/profitability, solvency or compliance with regulatory requirements. For instance, should interest rate risk be identified as a material risk, institutions should first determine their portfolio vulnerability to a shock in interest rate risk. An analysis of the institution's risks would help it to determine the changes in risk drivers and scenarios the institution would be most affected by.

25. With this in mind, an analysis of past losses can provide valuable information. The institution could identify the cause of past losses and the circumstances under which those are likely to recur. When doing so, the institution should take account of the current composition of its loan and asset portfolios, including pre-emptive management action undertaken to reduce the severity of specific shocks. It should also consider the strategy and business developments it intends to carry out in the near future.

26. Institutions should be able to justify their choice of the risk drivers stressed.

ST4. Depending on their situation, institutions should consider historical and/or hypothetical scenarios

27. Historical scenarios may not necessarily reflect an "exceptional but plausible event" and such scenarios may not sufficiently stress the portfolio sensitivities of the institution. Historical events may also fail to capture changes in the nature of the financial markets and new products recently developed. However, historical scenarios (where a range of risk drivers are moved simultaneously) may provide useful information on the way risk drivers behave collectively in a crisis and they may therefore be useful to

assess the assumptions of an internal capital model, and in particular correlation estimates.

ST5. Stress testing should be based on exceptional but plausible events:

28. When considering the choice of stresses to be performed:

    - Stresses and scenarios used should be consistent with the risk appetite that the institution has set to itself. This will usually be an iterative process. The calibration of those stresses should be based upon the institution's ICAAP.

    - Institutions should run stress tests of different degrees of severity and likelihood. In doing so, it may be useful to consider recessions of varying degrees of severity that may occur within an economic cycle (e.g. a mild recession and a severe recession).

    - When considering historical scenarios, institutions should base stresses on exceptional but plausible scenarios over a given period of time, ideally using data spanning a whole economic cycle.

    - Institutions need to understand how severely future profitability (or lack of) can affect their capital. Considering the range of available actions, it is possible that an institution may decide to keep a capital buffer that is not aligned with the exceptional but plausible scenarios performed. However, if this is the case, the institution should be prepared to explain to the supervisory authority how it would cope with an equivalent stress, for instance, by either raising additional capital or by taking management actions.

ST6. Stress testing should in principle be applied at the same level as the ICAAP

29. The way the ICAAP is structured influences the level on which stress tests are performed. It is possible that institutions have a centralised approach to stress testing, requiring each business unit to perform the same stress tests across the group. Stresses and scenarios for capital purposes may also be run centrally based on the group's consolidated portfolio. For example integrated cross-border banks with strong centralised functions can conduct the stress testing for the group as a whole. But it is also possible that individual business units/legal entities are run separately and produce their own ICAAP. In all cases, stress testing at the group level is greatly facilitated if the institution has an integrated approach, where stresses are consistent across the group.

30. However, under an integrated approach institutions should consider country or specific analysis in stress testing. Stress tests should be sufficiently tailored in order to cater for situations where specific markets or segments in different countries may exhibit extremely different characteristics and development stages and therefore call for different stress tests.

31. For smaller entities within large banking groups, stress testing can be performed by a specialized function at the parent level, provided the material risks of these entities are adequately captured and the local management is still aware of the risks for these entities. In such a situation, the supervisory review process with regard to stress testing will be implemented in accordance with the CEBS guidelines on supervisory cooperation for cross-border banking and investment firm groups, taking due account of the significance of the different entities within a group.

III.4. Frequency and time horizon of stress testing

ST7. The frequency of stress testing should be determined in accordance with the nature of the risks to which the institution is exposed and the types of tests performed.

32. To determine the frequency of stress tests, the following items can be relevant:

- The nature of the risk drivers captured under the stress testing framework and in particular their volatility. Generally, stress testing should be conducted as frequently as necessary and any regular stress test should be performed at least once a year.

- The techniques used by institutions while performing stress tests. In some cases, lower frequency may reflect the more complex nature of stress testing. Where the construction of hypothetical scenarios is deemed more difficult, given the time necessary to gather data for instance, the performance of such a test might be less frequent.

- Significant changes in the external environment or in the risk profile of institutions. Irrespective of the intrinsic volatility of risk drivers, some market disruption, downgrading in the global operating environment or difficulties in specific sectors or on specific names may encourage institutions to update their stress tests or to perform them on a more frequent basis and/or to enlarge the range of assumptions.

- The availability of the external data required to conduct the stress tests (for instance, data necessary to perform macro-economic stress tests). However, as a result of the dialogue between the institution and the supervisor, lack of such data may not be seen as a sufficient reason to delay the implementation of stress tests or not perform them at the right frequency, unless the institution can demonstrate that it has taken reasonable steps to find alternative ways to stress test but there are no alternative ways available.

ST8. Institutions should determine the time horizon of stress testing in accordance with the maturity and liquidity of the positions stressed where applicable.

33. Market risk requires constant monitoring of its evolution over time (i.e. day-to-day to 10 days), while stress testing on credit risk may be conducted on the assumption of a longer holding period (i.e. several years). In general,

the appropriateness of the time horizon should be determined depending on whether changes in the underlying portfolio under consideration take a longer time to implement or not (for instance the time it takes to re-balance the portfolio).

ST9. Under specific circumstances, supervisors may require institutions to perform ad hoc stress tests at a specific point in time.

34. In addition to the stress tests regularly performed by institutions as an integral part of their risk management, ad hoc stress tests may be required by supervisors if deemed necessary:

- To assess the impact of an observed deterioration in the environment on the financial condition of a given institution, where this situation has not been taken into account by the institution itself in its stress testing process,

- When the supervisory assessment of the stress testing process under the SREP questions the assumptions made by the institution,

- To assess the impact of similar stress tests across a range of institutions.

In doing so, supervisors would discuss with the institution the feasibility of conducting ad hoc supervisory stress tests.

III.5. Data quality and IT systems

ST10. Institutions should use appropriate and representative data when performing stress tests and the IT resources should be commensurate with the complexity of the techniques and the coverage of stress tests performed by institutions

35. Guidance on data appropriateness, quality standards, consistency with accounting data and representativeness, as well as data sources, provided in the CEBS Guidelines on the implementation, validation and assessment of Advanced Measurement (AMA) and Internal Ratings Based (IRB) Approaches is useful in the context of stress testing. If appropriate, institutions should use day-to-day management data when performing stress tests. Where stress tests do not capture the whole portfolio, data has to be representative.

36. IT platforms, organisation and data warehousing facilities should be sufficiently sound to support the quantification and effective management of the stresses that could affect a group. In any case, institutions should assign resources adequate to the stress testing techniques implemented.

37. Section III.5 is an example of where supervisors will be mindful of the considerations presented in paragraph .5.

III.6. Role of the management body and senior management; reporting and interpretation of stress testing results

38. The term 'Management body' as defined in Article 11 of the CRD should be understood to embrace different structures, such as unitary and dual board structures. In keeping with the CEBS Guidelines on the Supervisory Review Process, the use of the term 'management body' does not advocate any particular board structure. The management body represents the top management level of an institution, and senior management (which is not defined in the CRD) should be understood to represent the level of management below the management body. When the CEBS Guidelines on the Supervisory Review Process identify a function of the management body, it specifies whether the reference is to the supervisory function, the management function, or both.

39. For the purpose of this Annex to the CEBS Guidelines on the Supervisory Review Process, it is not appropriate for CEBS to seek to define the responsibilities of the supervisory and management functions of the management body, because of the high degree of granularity in this Annex and the different traditions and legal frameworks in the national jurisdictions. Therefore, it is up to each national authority to define which function of the management body is responsible for the tasks and responsibilities listed in the internal governance section below, and which internal body of the institution represents the supervisory and which the management function

ST11. The management body has the ultimate responsibility for the overall stress testing framework. Where appropriate the management body can delegate certain aspects of this framework to specific risk committees or senior management, keeping the effective oversight.

- Even if the identification of risk drivers obviously involves experts within the institution such as economists, traders or business managers, the involvement of the management body in the stress testing framework and of senior management in the stress testing design is essential to ensure they buy into the process In this perspective, the management body should approve the institution's overall stress testing framework and senior management should approve the design of the sensitivity analyses or scenario tests.

- Both the management body and senior management should formally consider the results and senior management should come up with a clear understanding of their implications, keeping in mind the risk appetite of the institution. While interpreting the results, senior management should be aware of the limitations of the stress tests performed (e.g. probability of the event occurring or judgmental bias in the stress test's specification).

ST12. The stress testing process should be an integral part of an institution's risk management framework, with clear reporting lines and communication in an understandable format.

40. The quality of the reporting process is essential to ensure a good understanding of the stress testing results by both the management body

and senior management and its ability to adopt, if necessary, appropriate action accordingly. In particular, this entails the following:

- Stress testing results should be reported to senior management and to the management body both in an appropriate form and with an appropriate frequency that allow both to consider whether the risks undertaken by the institution are consistent with the risk appetite set by it.

- The stress testing reports should provide the management body and senior management with an overview of the material risks the institution is or might be exposed to

- Reporting may be limited to only a few of the stress tests performed by the institution. It should draw the attention to potential risks and should provide recommendations for possible remedial measures or actions when appropriate. It could in particular be necessary to mention the main assumptions of reported scenarios, include the results of previous stress tests for those performed regularly as well as the prevailing conditions as a benchmark to help decisions.

The assumptions underlying stress testing and the results should be reported to the supervisors when requested.

ST13. Where deemed appropriate by the institution, it should take remedial measures or actions considering the level of risk exposure as revealed by stress tests and the objectives and risk tolerances defined by the management body.

41. The management body and senior management have the responsibility to take remedial measures or actions, where deemed necessary. These measures or actions may vary depending on the circumstances, e.g.:

- reviewing the set of limits, especially in cases where legislative requirements indicate that the results of the stress tests should be reflected in the limits set by institutions (i.e. requirements relative to market risks and to credit risk mitigation techniques),

- recoursing to risk mitigation techniques,

- reducing exposures or business in specific sectors, countries, regions or portfolios,

- reconsidering the funding policy,

- reviewing capital adequacy, and

- implementing contingency plans.

Supervisors would not necessarily expect institutions, when taking remedial measures or actions, to rely on a single and specific corrective measure.

42. On the other hand, the management body and/or senior management may decide to take no remedial measure or action to the extent that it is comfortable with the risk-return consequences stemming from the results of the stress tests.

43. Without prejudice to the responsibility of the management body and senior management to take or not to take remedial actions, where appropriate, supervisors could need to understand the rationale for the decisions taken. This discussion may be part of the dialogue under the supervisory review process. In particular, if an institution addresses the results of stress tests through taking corrective actions, supervisory authorities could establish whether (i) such actions will be available in a period of stress and (ii) the institution will be able and willing to take such actions. An indicator for the credibility of such actions could be that the institution has in the past taken similar measures.

44. Decisions relative to remedial measures or actions taken by the management body or the senior management within the ICAAP process should be documented (e.g. minutes of the relevant Committee).

ST14. Appropriate documentation should be in place to facilitate the adequate implementation of the whole stress testing framework.

45. As indicated in CEBS's guidelines on the application of the supervisory review process, the institution's objectives, risk strategies and policies adopted to achieve these objectives should be clearly defined in a written document approved by the management body or a designated committee thereof. As far as the stress testing process is concerned, all material information (e.g. scope of exposure, underlying assumptions, responsibilities, reporting lines and types of remedial measures and actions) should be appropriately documented.

III.7. Review and update of stress testing methodology

ST15. Institutions should consider periodically whether stress tests are still adequate. In particular, institutions should ensure that assumptions regarding the risk profile and the external environment are still valid over time.

46. The institution should conduct an assessment of the adequacy of the stress tests particularly in the light of changes in portfolio characteristics or in the external environment once a year, and on a more frequent basis where the risk profile of the institution changes quickly. In particular, this internal assessment should consider the relevance of the following:

- the scope of exposures captured under the stress testing process,
- the validity of the assumptions,
- the adequacy of the management information system,

- the integration into the institution's management processes, including the clarity of reporting lines,

- the approval policy of the stress testing process (including in case of changes),

- the reliability, accuracy and completeness of data incorporated into the stress testing process, and

- the quality of the documentation of the stress testing process.

IV. Stress testing guidelines by risk categories

47. The following section details some of the stress test requirements of the CRD elaborating specific guidelines for macroeconomic stress testing and stress testing by risk categories (market risk, liquidity risk and credit risk) and, where necessary, considers the interaction between Pillar 1 and Pillar 2 stress testing. Stress tests on the Interest Rate Risk in the Banking Book are dealt with in CEBS Consultation Paper on technical aspects of the management of interest rate risk arising from non trading activities and concentration risk under the supervisory review process (CP11). These guidelines do not give any guidance on counterparty credit risk with respect to trading book activities following the so-called 'Trading book review'.

48. This section is not meant to provide a supervisory checklist of stress tests that should be performed by institutions, but to promote practical criteria to be used by supervisors when discussing specific stress tests carried out by institutions under the supervisory review process. As mentioned in the executive summary of these guidelines, proportionality concerns as well as the dialogue with the institutions are key in this process. Examples given below are for illustrative purposes only.

IV.1. Macro-economic stress tests

49. Under Annex V Paragraph 2 of the CRD, institutions should manage, monitor and mitigate the risks they are or might be exposed to, including those posed by the macro-economic environment in which they operate in relation to the position in the business cycle.

ST16.In line with one of the CEBS's High Level Principles listed in the CEBS Guidelines on the Supervisory Review Process (ICAAP 8) institutions should use stress testing as one (among others) tool to assess the risks in a forward looking manner.

50. Taking into account the principles set out in section III.1 of this paper, the decision on which risk categories and to what extent macro-economic stress-testing is applied is within the institution's own responsibility. An institution should carry out its capital assessment taking into account its future business plans. This is because certain strategies may need to be adequately funded by the institution in advance of their implementation.

51. In doing so, an institution should consider the effects of macro-economic factors on its capital and, to the extent possible, on earnings and whether they could affect its strategic plans. For instance, an institution may like to explore the effects an economic downturn will have on its portfolio and assess the impact on its current level of capital should it want to achieve its strategic objectives under such stressed conditions. If applicable, macro-economic scenarios or stresses should be sufficiently granular to simulate each material risk the institution has previously identified as part of its internal capital assessment. Macro-economic scenarios or stresses should be of a magnitude equivalent to an exceptional but plausible event.

IV.2. Market Risk

IV.2.a. General principles

52. Under paragraph 10 of Annex V of the CRD, all institutions, irrespective of the method used for the calculation of capital requirements for market risks, shall implement policies and processes for the measurement and management of all material sources and effects of market risks.

ST17.As part of these policies and processes, institutions should conduct stress tests for their positions in financial instruments in the trading book.

- If applicable, institutions should consider a range of exceptional but plausible market shocks or scenarios for their trading book positions. In particular, "exceptional" changes in market prices, shortages of liquidity in the markets and defaults of large market participants have to be taken into account. Dependencies between different markets should also be factored in.

- The stress tests applied and the calibration of those tests should reflect the nature of the portfolios, the trading strategies of the institution and the time it could take to hedge out or manage risks under severe market conditions. As their instruments and trading strategies change, the stress tests should also evolve to accommodate the changes.

IV.2.b Principles for institutions using an internal model for the calculation of their market risk minimum capital requirements

53. Under Annex V of the CAD (2006/49/EC), institutions applying for the use of internal models to calculate capital requirements for market risks shall frequently conduct a rigorous programme of stress testing, the results of which shall be reviewed by senior management and reflected in the policies and limits it sets. Depending on the nature of the portfolio the stress tests could factor in (where applicable):

    - illiquidity/gapping of prices (including interest rates and exchange rates),
    - concentrated positions (in relation to market turnover),
    - one-way markets,
    - non-linear products / deep out-of-the-money positions,

- events and jumps-to-default, and
- significant shifts in correlations and volatility.

In particular, they should cover other risks that may not be captured appropriately in the minimum capital requirements for market risks (such as recovery rate uncertainty, implied correlations or skew risk).

ST18. For those institutions using internal models for the calculation of regulatory capital requirements for market risks, supervisory requirements for stress testing remain unchanged. Their on-going fulfilment will be considered under the SREP.

54. For institutions that are allowed to apply internal models where the regulatory capital is calculated under a more risk sensitive approach being assessed against a 10 day time horizon and 99 percentile confidence level, it is important that tail events beyond that confidence level, such as those noted in the section above, are considered. Based on current guidelines, a rigorous stress testing programme should satisfy the following criteria:

- all material risk drivers which could entail extraordinarily large losses, or which could severely hamper risk management, should be encompassed. Those factors include events with low probability for all main risk types, especially the various components of market risks. The impact of stress situations on both linear and non linear products should be captured. The tests should be applied at an appropriate level, as defined by the institution.

- the programme should assess the consequences of major market disturbances and identify plausible situations which could entail extraordinarily high losses. At portfolio level, the effects of changed correlations should be explored. Mitigating effects as consequences of contingency plans may be taken into account if the plans are based on plausible assumptions about market liquidity.

- the programme should encompass situations identified by institutions as exceptional but plausible based on their portfolios' characteristics.

- institutions should list the measures taken to reduce their risks and preserve their own funds. In particular, limits on exchange rate, interest rate, equity price and commodity price risks set by institutions should be checked against the results of the stress testing calculations.

55. Bearing in mind the results of stress testing, supervisors may consider whether an institution has sufficient own funds to cover the minimum capital requirements, taking into account the nature and scale of the institution's trading activities and any other relevant factors, such as valuation adjustments made by the institution.

IV.3. Credit risk stress testing

56. Discussions on stress testing for credit risk often focus on stress testing for IRB institutions. However, Pillar 2 ICAAP requires all institutions to assess

and manage their capital adequacy in a forward looking manner. Therefore, credit risk concentration stress tests also play an important role here.

IV.3.a. Concentration Risk

57. The following detailed guidance focuses on one specific aspect of concentration risk only, i.e. the financial collateral values in connection with large exposures. A broader approach to stress testing on concentration risk is addressed in the CEBS "Consultation paper on technical aspects of the management of interest rate risk arising from non-trading activities and concentration risk within Pillar 2" (CP 11)

58. Article 114 (3) of the CRD requires that institutions using exposure values calculated according to the financial collateral comprehensive method under Articles 90 to 93 and Annex VIII for identifying large exposures (LE), as defined by Article 111, or recognising the effects of financial collateral estimated separately from other LGD relevant aspects for identifying large exposures, shall periodically perform a stress test of their credit risk concentrations including the impact on the realisable value of any collateral taken in stressed situations. Where the results of this test indicate a lower realisable value in times of stress, an institution shall adjust the value of collateral taken into account when calculating the value of exposures for its LE limit. As an alternative, it could consider taking additional financial collateral.

ST19. Institutions under the large exposures provisions using the comprehensive method for calculating the effects of financial collateral, or permitted to use their own estimates of LGDs and conversion factors, should identify conditions which would adversely affect the realisable value of their financial collateral

59. Although the CRD is silent as to the form, such market conditions may include downturn scenarios or other events which may affect the realisation of the collateral's estimated value, such as a decrease in credit quality of the collateral issuers or market illiquidity which impacts the liquidation period taken into account when calculating the effects of financial collateral for those institutions using the comprehensive method based either on the supervisory volatility adjustments or on their own estimates of volatility adjustments.

60. The potential for such events to occur may be determined by institutions based on the type of financial collateral used. Different assumptions may legitimately be used between sovereign debt collateral and equities/convertible bonds collateral. Other examples which may affect the financial collateral's estimated value include currency mismatch between exposure and financial collateral, arrangements for marking to market and the realisation of value from large amounts of financial collateral from a single source in a 'distressed sale'.

61. When considering a downturn, institutions may also find it useful to consider a 'mild recession' scenario as per CRD, annex 7, part 4, paragraph

41 as one market condition which could have a detrimental effect on own funds.

62. An institution should conduct the stress test as frequently as its risk profile demands.

ST20. According to Article 114 (3) of the CRD, where the results of the stress testing indicate a lower realisable value of collateral, the value of collateral taken into account for the purpose of determining an institution's LE limits should be adjusted accordingly.

63. To avoid such adjustments institutions may think it prudent to ensure that an appropriate margin over the collateralised exposure is maintained. This would cover fluctuations in the market value of the collateral to ensure that it does not fall below the reported level.

IV.3.b. Stress testing for IRB institutions

64. According to Annex XI paragraph 1a, the review and evaluation performed by competent authorities pursuant to Article 124 shall include the results of the stress tests carried out by the credit institutions applying an IRB approach. These institutions are subject to specific provisions in Annex VII Part 4 of the CRD, Section 1.8, Paragraphs 40 to 42 and Paragraph 114.

65. Furthermore, according to Article 84 (2) of the CRD, institutions shall only be given permission to calculate their risk weighted exposure amounts using the IRB approach if the competent authority is satisfied that the credit institution's systems for the management and rating of credit risk exposures meet the minimum requirements of Annex VII Part 4 of the CRD.

66. Paragraph 40 of Annex VII Part 4 requires institutions to examine potential unfavourable effects on their credit exposures and their "ability to withstand such changes" by means of stress testing.

67. As for the purpose of paragraph 40, the "ability to withstand such changes" means amongst other measures that the institution's available capital resources cover credit risks for the credit portfolio derived from a particular stress scenario. Stress testing in this case consists of "identifying possible events or future changes in economic conditions that could have unfavourable effects on an institution's credit exposures".

68. By contrast, the paragraph 41 stress test is designed to address the effect of certain specific conditions, including at least mild recession scenarios, on its total capital requirements for credit risk. Since those capital requirements could change dependent on the stage within the economic cycle, those stress tests should show the potential impact on capital requirements. The stress tests could thus show the need for possible action on the part of the institution, including the possible need for an increase in own funds.

69. Because minimum capital requirements for credit risk may be dependent on certain specific economic conditions, paragraph 41 requires institutions to conduct a stress test on the impact of at least a mild recession, on their regulatory IRB capital requirement. This aims to assess an institution's ability to continue to meet its Article 75 credit risk capital requirements.

70. Given the above, a suitable macro-economic scenario covered by this stress test should be at least a mild recession but may go further, assessing the impact of ratings migration on capital requirements with respect to the economic cycle. This could include a significant and sustained deterioration in the economic climate. To this end, institutions should consider a range of stress tests and scenario analysis.

71. It is up to institutions to determine how this translates into specific risk drivers and how these risk drivers in turn affect an institution's total capital requirements for credit risk. Institutions may find it helpful to develop these linkages on an asset by asset class basis (for example, factors relevant to mortgages may be different to corporate asset classes).

72. Where an institution has numerous businesses, questions of diversification may arise, particularly across different geographic areas which may be subject to economic conditions that are not synchronised. Therefore it is not necessarily assumed that the aggregated impact is equal to the simple sum of each business's figures. However, in the spirit of the test, institutions should apply reasonable conservatism in specifying correlations and be able to justify their choices.

73. These stress tests should be undertaken at least annually. This aims to ensure that stress testing becomes a useful tool to both institutions and the supervisors in anticipating changes to the level of regulatory capital requirements for credit risk and therefore encourage good risk management.

74. The result of the stress test has no direct effect on the Article 75 requirement and does not necessarily mean an additional requirement (i.e. extra capital or other measures), for example to the extent that:

- institutions are dealing with products or counterparties that can be shown to be countercyclical,
- institutions can demonstrate credible management actions which can counter potential capital deficits (see section III.6 of this paper), or
- if the economy is already in a recession.

75. However, under the supervisory review process, to the extent that the stress test indicates a deficit, among other measures additional capital may be required.

76. The function responsible for IRB stress testing could be the Credit Risk Control function (as defined in the CEBS Guidelines on the implementation, validation and assessment of AMA and IRB approaches) in order to maintain the objectivity of stress testing. Another reason is that, among the activities to be performed by the Credit Risk Control Unit, there are some that, to some extent, refer to stress testing (see paragraph 128 of Annex VII, Part IV)

77. There is no expectation that the stress tests referred to in paragraph 40 or 41 will necessarily produce an LGD that is either lower than, or higher than, the LGD estimated according to Annex VII, part 4, paragraph 73. To the extent that the identification of downturn periods under paragraph 73 coincides with the stress tests in paragraph 40 or 41, the calculation might turn out to be similar. More generally, some stress test calculations under paragraph 40 or 41 may function as one tool for assessing the robustness of the LGD estimation under paragraph 73. For further details refer to the CEBS Guidelines on the implementation, validation and assessment of AMA and IRB approaches.

78. For the purpose of calculating capital requirements, according to Annex VII, Part 4, Paragraph 115 g) of the CRD (referring specifically to the equity portfolio) institutions shall have a rigorous and comprehensive stress-testing programme in place. Since this is a particularly narrow stress test which applies only to IRB firms using the modelling approach to equity and since there will probably be only a few institutions applying this approach no further guidelines apart from the general ones given in Sections I to III are given at this stage.

IV.4. Liquidity risk

79. According to Annex V paragraph 14 of the CRD, institutions shall have in place policies and processes for the measurement and management of their liquidity risk on an on-going and forward-looking basis. To this end, "alternative scenarios shall be considered and the assumptions underpinning decisions concerning the net funding position shall be reviewed regularly". According to Paragraph 15 contingency planning to deal with liquidity crises shall also be in place. This section elaborates on some principles and criteria to review the adequacy of stress testing with respect to liquidity risk (understood primarily as funding risk) under Pillar 2, in line with this legislative requirement.

ST21. Institutions should regularly project cash flows under alternative scenarios of various degrees taking into account both market liquidity (external factors) and funding liquidity (internal factors)

80. Institutions should be prepared to manage liquidity under stressed conditions. Though scenario design is the responsibility of each institution depending on its risk profile, institutions should project cash inflows and outflows considering both market-wide and institution-specific difficulties. For illustrative purpose, examples of such scenarios are provided in Annex 1. Institutions that are part of a wider group may evaluate scenarios on a global or regional basis if they can demonstrate the appropriateness of such a decision.

ST22. When assessing the impact of these scenarios on their cash flows, institutions should rely on a set of reasonable assumptions that should be reviewed regularly.

81. Examples for what features these assumptions could possibly capture are presented in Annex 1.

82. Different techniques may be used by institutions to derive cash inflows and outflows under stress such as the use of historical patterns, statistical modelling, judgmental projections or a combination of these. Notwithstanding the techniques used – but especially where judgmental projections have a leading role – assumptions should be assessed frequently to determine their continuing validity.

ST23. Institutions should have in place adequate contingency plans in the event of the realisation of a liquidity crisis.

83. Contingency plans may differ across institutions depending for example on the extent to which they rely on external parties in a stressful situation. The adequacy of these plans will be reviewed by supervisors. Examples for elements of a contingency plan are provided in Annex 1.

ST24. To come up with a complete view of various risk positions, stress testing of other risk types may be usefully considered to design "alternative liquidity scenarios".

84. Some useful information for "alternative liquidity scenarios" may stem from stress testing in other areas such as market risk, credit risk, reputation risk or operational risk. Reputation risk might be an important trigger of adverse liquidity conditions since it interacts with the optionality granted to counterparties. Operational risk may also be a source of liquidity disruptions (for instance, an event in a major financial centre).

ST25. Supervisors may perform their own stress tests based on available data in their assessment of liquidity risk under SREP.

85. For internal purposes supervisors may design specific stress scenarios based on available information previously reported by institutions subject to some quantitative requirements relating to liquidity. Such scenarios may, in particular, incorporate conservative assumptions to test, for instance, the ability of the institution to withstand a downgrade using its available liquidity resources. In such a case, supervisors may apply different discount factors to assets considered as liquid and conservative behavioural assumptions for saving and sight deposits.

V. Considerations for other risk categories.

86. Article 123 of the CRD requires that credit institutions when conducting the ICAAP have to consider the "nature and level of the risks to which they are or might be exposed". If the level of risk of a specific category is material enough to make the institution vulnerable with respect to this risk, the institution has to take the risk into account when assessing the adequacy of its internal capital. However, some risks are more qualitative in nature and therefore cannot be measured exactly. This can be due to the nature of the risk or a low level of sophistication with respect to risk measurement within the institution. Nevertheless, CEBS's guidelines on the application of the supervisory review process state that risks which are not precisely

quantifiable should be included in the ICAAP if they are material.[4] Stress testing according to Section III of these guidelines could be a means to arrive at such an assessment. Examples of such "impossible to be modelled exactly" risks could be risks specific to certain jurisdictions, some kinds of operational risk (e.g. legislative risk), reputation risk or strategic risk.

[4] However, see ICAAP 9 lit. g. 2nd sentence of CEBS's guidelines on the application of the supervisory review process.

Annexes

Annex 1: Examples concerning liquidity risk

1. Some examples for elements concerning scenarios for projecting cash inflows and outflows considering both market-wide and institution-specific difficulties are the following:

   To test market illiquidity or system-wide events, scenarios may assume:

   - interbank market difficulties,
   - the withdrawal of a major market player from a particular market,
   - illiquidity in specific markets (e.g. crisis in emerging countries), and
   - distress of specific currencies important for the institution's funding.

   To test institution-specific liquidity distress, scenarios may assume:

   - a downgrade of its own rating or an expectation of a downgrade leading to an increase in funding cost,
   - a sharp increase in the drawdown of commitments by borrowers,
   - a sudden change in the composition of deposits and a sudden increase of cash deposit withdrawals, and
   - a tightening of credit lines.

2. Examples for reasonable assumptions when assessing the impact of these scenarios on the cash flows are:

   - the institution's projected stock of potential assets,

   Institutions could consider (i) the expected proportion of maturing assets that will be roll-over, (ii) the expected amount of new loans that will be approved, and (iii) the level of draw downs of commitments to lend that the institution will need to fund.

   - the cash flows arising from the institution's liabilities under stress conditions,

   These may be derived in comparison with the cash flows that normally arise (i.e. given the level of roll-overs, the effective maturity of liabilities with non-contractual maturity and the growth of deposits). Assumptions on the liability side are likely to determine (i) the stable sources of funding in cases of stress, (ii) the potential run-off of liabilities with non-contractual maturities, (iii) the potential exercise of options giving counterparties the right to withdraw funds immediately, as well as (iv) the potential use of back-up facilities.

- the market perception of the institution and its access to the markets.

This may include assumptions relative to the institution's access to OTC derivative and foreign exchange markets, as well as its access to secured funding, including by way of repo transactions. Securitisation may be also considered to assess potential triggering of early amortisation. Institutions may also estimate their capacity to sell assets including the terms of such sales (e.g. discounts).

3. Examples for elements of a contingency plan are:

- definition of the events triggering the plan,

- a description of the potential sources of funding either on the asset or on the liabilities side (e.g. slowing loan growth, sale or repo of liquid assets, securitisation, subsidiary sales, increasing deposit growth, lengthening maturities of its liabilities as they mature, draw-down of committed facilities, capital raising, stopping dividends to parents),

- an escalation procedure detailing how additional funds could be raised,

- a procedure for the smooth management of the contingency, which should include a description of the delineation of responsibilities (including the responsibilities of the management body) and a process to ensure timely information flow (for instance through contact lists), and

- a procedure to guide potential contacts with external parties such as important counterparties, auditors, analysts, media or supervisory authorities.

Annex 2

LIST OF RELEVANT PROVISIONS FROM THE CAPITAL REQUIREMENTS DIRECTIVES (including trading activities related issues and the treatment of double default effects)

Directive 2006/48/EC

Article 114. CRM eligibility for large exposures. Collateral value in stressed situations

(…)

3. A credit institution which is permitted to use the methods described in paragraphs 1 and 2 in calculating the value of exposures for the purposes of Article 111(1) to (3) shall conduct periodic stress tests of their credit risk concentrations including in relation to the realisable value of any collateral taken.

These shall address risks arising from potential changes in market conditions that could adversely impact the credit institutions' adequacy of own funds and risks arising from the realisation of collateral in stressed situations

The credit institution shall satisfy the competent authorities that the stress tests carried out are adequate and appropriate for the assessment of such risks.

In the event that such a stress test indicates a lower realisable value of collateral taken than would be permitted to be taken into account under paragraphs 2 and 3 as appropriate, the value of collateral permitted to be recognised in calculating the value of exposures for the purposes of Article 111(1) to (3) shall be reduced accordingly.

Annex V. Technical criteria on the treatment on organisation of risks

(…)

2. The management body referred to in Article 11 shall approve and periodically review the strategies and policies for taking up, managing, monitoring and mitigating the risks the credit institution is or might be exposed to, including those posed by the macroeconomic environment in which it operates in relation to the status of the business cycle.

(…)

10. Liquidity risk

14. Policies and processes for the measurement and management of their net funding position and requirements on an ongoing and forward-looking basis shall exist. Alternative scenarios shall be considered and the assumptions underpinning decisions concerning the net funding position shall be reviewed regularly.

15. Contingency plans to deal with liquidity crises shall be in place.

Annex VII. Part 4. Stress tests according to minimum requirements for IRB Approach

(…)

1.8. Stress tests used in assessment of capital adequacy

40. A credit institution shall have in place sound stress testing processes for use in the assessment of its capital adequacy. Stress testing shall involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a credit institution's credit exposures and assessment of the credit institution's ability to withstand such changes.

41. A credit institution shall regularly perform a credit risk stress test to assess the effect of certain specific conditions on its total capital requirements for credit risk. The test to be employed shall be one chosen by the credit institution, subject to supervisory review. The test to be employed shall be meaningful and reasonably conservative, considering at least the effect of mild recession scenarios. A credit institution shall assess migration in its ratings under the stress test scenarios. Stressed portfolios shall contain the vast majority of a credit institution's total exposure.

42. Credit institutions using the treatment set out in Part 1, point 4 shall consider as part of their stress testing framework the impact of a deterioration in the credit quality of protection providers, in particular the impact of protection providers falling outside the eligibility criteria.

Annex VII.Part 4. LGD and Conversion Factors estimates under IRB

(…)

74. Credit institutions shall use LGD estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a rating system is expected to deliver constant realised LGDs by grade or pool over time, credit institutions shall make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

(…)

88. Credit institutions shall use conversion factor estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a rating system is expected to deliver constant realised conversion factors by grade or pool over time, credit institutions shall make adjustments to their estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

Annex VII. Part 4. Stress testing requirements for Value-at-risk models for equity exposures under the Internal models approach.

115. For the purpose of calculating capital requirements credit institutions shall meet (for the equity portfolio) the following standards: (…)

g) A rigorous and comprehensive stress-testing programme shall be in place.

Annex VII. Part 4. Corporate Governance requirements

(…)

127. Internal ratings-based analysis of the credit institution's credit risk profile shall be an essential part of the management reporting to these parties. Reporting shall include at least risk profile by grade, migration across grades, estimation of the relevant parameters per grade, and comparison of realised default rates and own estimates of LGDs and conversion factors against

expectations and stress-test results. Reporting frequencies shall depend on the significance and type of information and the level of the recipient.

Annex VIII. Part 3. Stress testing with respect to Internal models approach for calculating fully adjusted exposure value for exposures subject to master netting agreements (under CRM rules).

(…)

16. Recognition shall only be given if the competent authority is satisfied that the credit institution's risk-management system for managing the risks arising on the transactions covered by the master netting agreement is conceptually sound and implemented with integrity and that, in particular, the following qualitative standards are met:

(g) the credit institution frequently conducts a rigorous programme of stress testing and the results of these tests are reviewed by senior management and reflected in the policies and limits it sets;

(…)

Annex VIII Part 3. Own estimates of volatility adjustments under the Financial Collateral Comprehensive Method

50. Credit institutions shall take into account the illiquidity of lower-quality assets. The liquidation period shall be adjusted upwards in cases where there is doubt concerning the liquidity of the collateral. They shall also identify where historical data may understate potential volatility, e.g. a pegged currency. Such cases shall be dealt with by means of a stress scenario.

Annex XI. Stress testing under the SREP by the competent authorities.

1. In addition to credit, market and operational risk, the review and evaluation performed by competent authorities pursuant to Article 124 shall include the following:

(a) the results of the stress test carried out by the credit institutions applying an IRB approach;

(b) the exposure to and management of concentration risk by the credit institutions, including their compliance with the requirements laid down in Articles 108 to 118;

(c) the robustness, suitability and manner of application of the policies and procedures implemented by credit institutions for the management of the residual risk associated with the use of recognized credit risk mitigation techniques;

(d) the extent to which the own funds held by a credit institution in respect of assets which it has securitised are adequate having regard to the economic substance of the transaction, including the degree of risk transfer achieved;

(e) the exposure to and management of liquidity risk by the credit institutions.

(f) the impact of diversification effects and how such effects are factored into the risk management system

(g) the results of stress tests carried out by institutions using an internal model to calculate market risk capital requirements under Annex V of Directive [2006/49/EC]

Directive 2006/49/EC

Annex V. Use of Internal Models to calculate capital requirements for market risks

(…)

2. Recognition shall only be given if the competent authority is satisfied that the institution's risk-management system is conceptually sound and implemented with integrity and that, in particular, the following qualitative standards are met:

(…)

g) the institution frequently conducts a rigorous programme of stress testing and the results of these tests are reviewed by senior management and reflected in the policies and limits it sets. This process shall particularly address illiquidity of markets in stressed market conditions, concentration risk, one way markets, event and jump-to-default risks, non-linearity of products, deep out-of-the-money positions, positions subject to the gapping of prices and other risks that may not be captured appropriately in the VaR model. The shocks applied shall reflect the nature of the portfolios and the time it could take to hedge out or manage risks under severe market conditions; (…)

Trading book review (trading activities related issues and the treatment of double default effects)

Annex III. EPE (Expected Positive Exposure Models). Stress testing as a supplement to counterparty credit risk

(…) Part 6

24. A credit institution shall have a routine and rigorous program of stress testing in place as a supplement to the CCR analysis based on the day-to-day output of the credit institution's risk measurement model. The results of this stress testing shall be reviewed periodically by senior management and shall be reflected in the CCR policies and limits set by management and the board of directors. Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps shall be taken to manage those risks appropriately.

(…)

32. A credit institution shall have in place sound stress testing processes for use in the assessment of capital adequacy for CCR. These stress measures shall be compared with the measure of EPE and considered by the credit institution as part of the process set out in Article 123. Stress testing shall also involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a credit institution’s credit exposures and an assessment of the credit institution’s ability to withstand such changes.

33. The credit institution shall stress test its CCR exposures, including jointly stressing market and credit risk factors. Stress tests of CCR shall consider concentration risk (to a single counterparty or groups of counterparties), correlation risk across market and credit risk and the risk that liquidating the counterparty’s positions could move the market. Stress tests shall also consider the impact on the credit institution’s own positions of such market moves and integrate that impact in its assessment of CCR.