EBA/CP/2017/17

31/10/2017

Consultation Paper

Draft Guidelines on institution's stress testing

Contents

1. Responding to this consultation

The EBA invites comments on all proposals put forward in this paper.

Comments are most helpful if they:

- indicate the specific point to which a comment relates;
- contain a clear rationale;
- provide evidence to support the views expressed/ rationale proposed; and
- describe any alternative regulatory choices the EBA should consider.

Submission of responses

To submit your comments, click on the 'send your comments' button on the consultation page by 31.01.2018. Please note that comments submitted after this deadline, or submitted via other means may not be processed.

Publication of responses

Please clearly indicate in the consultation form if you wish your comments to be disclosed or to be treated as confidential. A confidential response may be requested from us in accordance with the EBA's rules on public access to documents. We may consult you if we receive such a request. Any decision we make not to disclose the response is reviewable by the EBA's Board of Appeal and the European Ombudsman.

Data protection

The protection of individuals with regard to the processing of personal data by the EBA is based on Regulation (EC) N° 45/2001 of the European Parliament and of the Council of 18 December 2000 as implemented by the EBA in its implementing rules adopted by its Management Board. Further information on data protection can be found under the Legal notice section of the EBA website.

2. Executive Summary

These guidelines aim at achieving convergence of practices followed by institutions for stress testing across the EU. They provide detailed guidance to be complied with by institutions when designing and conducting a stress testing programme/framework. The EBA issues these guidelines to cover and update the CEBS guidelines on institutions' stress testing (GL 32), which will be repealed and replaced by these guidelines.

These guidelines reflect the conclusions of the peer review of the implementation of the CEBS Guidelines on Stress Testing (GL32).

The guidelines establish and develop the following concepts: the taxonomy of stress testing; the description of types of stress test exercises; the reverse stress testing process for both regular stress testing and recovery planning purposes; additional issues that have gained importance in the stress testing programme and need to be incorporated and properly defined, such as conduct risk and litigation costs, foreign exchange lending risk, interaction between solvency stress tests and liquidity stress tests, business models and data aggregation.

These guidelines recognise the principle of proportionality in both the quantitative and the qualitative aspects of stress testing: small and less complex institutions may focus more on the qualitative aspects whilst larger or more complex institutions will require more sophisticated stress testing techniques. Stress testing requires a certain frequency to be a meaningful attribute of an institution's risk management system. Such frequency should be determined having regard not only to the scope and type of the stress test but also the size and complexity of institution (proportionality principle), among other aspects. Moreover, regarding scope and coverage, stress tests should capture risks at various levels in an institution. In this regard, according to the proportionality principle, the scope of stress testing may vary from simple portfolio level sensitivity or individual risk level analyses to comprehensive institution-wide scenario stress testing.

The EBA launched a first consultation on its draft guidelines during the first quarter of 2016 and received 12 responses to the draft guidelines. The EBA assessed all the main arguments presented in the responses, with a view to deciding on whether amendments were required before issuing the final guidelines. The result of this assessment is presented in an extensive feedback section.

In April 2017, the EBA issued a roadmap outlining its plans to update the common European framework for the supervisory review and evaluation process (SREP) in 2017-2018. Given the close links between Pillar 2 Guidance (P2G) and wider aspects of supervisory stress testing (e.g. specification of what forms of supervisory stress testing can be used to set or update P2G) the revision of the SREP Guidelines also incorporated elements from the first draft Stress Testing Guidelines, in particular Section 5 ´Supervisory assessment of institution`s stress testing´, Section 6 'Supervisory stress testing', and Section 7 'Use of quantitative results for capital adequacy assessment purposes', which were also reviewed to reflect comments received in the public

consultation. This approach would allow consistent coverage and use of various aspects of supervisory stress testing in SREP, which is also an intention of Article 100 of the CRD.

Next steps

The guidelines are published for a three-month public consultation until 31.01.2018. They will be then finalised based on the outcomes of the consultation and 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 EBA aims to finalise the proposed guidelines during the first quarter of 2018, taking into account the comments received during the consultation and as currently foreseen, the application date will be in the second quarter of 2018.

3. Background and rationale

The EBA is mandated to foster sound and effective supervision across the EU arising from the requirements specified in Directive 2013/36/EU and more generally from its obligations under its founding regulation (Regulation (EU) No 1093/2010).

The relevant provisions legally supporting the issuance of the revised guidelines are the provisions of Articles 100 (2) of Directive 2013/36/EU, Article 16 of the EBA Regulation and the relevant principles set out in Regulation (EU) No 575/2013 and Directive 2013/36/EU.

Article 16 of Regulation (EU) No 1093/2010 provides that the EBA shall, with a view to establishing consistent, efficient and effective supervisory practices within the ESFS, and to ensuring the common, uniform and consistent application of Union law, issue guidelines and recommendations addressed to competent authorities or financial institutions.

Institutions are required to take a forward-looking view in their risk management, strategic planning, capital planning and liquidity planning as part of their internal capital adequacy assessment process required by Article 73 of Directive 2013/36/EU. One of the tools institutions can use to facilitate this forward-looking perspective in risk management is stress testing.

Since 2010, when the CEBS Guidelines on Stress Testing were issued, there have been a number of developments in stress testing with regard to its methodologies and usage. The financial crisis and several negative events in the financial sector since 2010 highlighted significant lessons in relation to stress testing practices. Supervisory expectations of institutions' stress testing practices have developed in light of the recent experience both within the EU and beyond. Several important conclusions were drawn from the 2013 EBA peer review on the implementation of the stress testing guidelines. The aim of the peer review performed by the EBA was to assess and compare the effectiveness of the supervisory activities related to the review of credit institutions' own stress testing programmes across the EU, as well as the implementation of related provisions by competent authorities[1]. In particular the results of the peer review suggested that all competent authorities' organisational and resource models had benefits, however, irrespective of the model, dedicated stress testing technical experts should have been involved. Competent authorities often focused on the largest institutions in their respective jurisdictions, and devoted far less attention to other institutions. Very few competent authorities required reverse stress testing, and when they did, it was often as part of a recovery planning only. Moreover, the incorporation of the outcomes of stress testing into the supervisory review and evaluation process (SREP) and the joint decision process on institution-specific prudential requirements for cross-border groups was handled differently across jurisdictions. Many of the assessed competent authorities have shown evidence of substantial work on top-down stress testing, from both a micro- and macro-prudential perspective.

For example, in many instances, competent authorities observed that stress testing was not sufficiently integrated into the institutions' risk management frameworks or senior management decision-making. In general, where stress testing was used, scenarios continued to be insufficiently severe. In other instances, competent authorities were observing that risk concentrations and feedback effects were not considered by institutions in a meaningful fashion.

[1] https://www.eba.europa.eu/-/eba-publishes-peer-review-on-the-implementation-of-the-stress-testing-guidelines

These guidelines aim at addressing deficiencies identified in the EBA peer review, and will assist institutions in understanding supervisory expectations of appropriate stress testing governance and infrastructure, and also cover the use of stress testing as a risk management tool. These guidelines are designed to identify the relevant building blocks required for an effective stress testing programme from simple sensitivity analysis on single risk factors or portfolios to complex macroeconomic scenario stress testing on an institution-wide basis.

While institutions' stress testing is a risk management tool that has been used for a long time, there remains substantial ambiguity and overlap in several terms and definitions. These guidelines, therefore, provide a taxonomy.

Additionally, in recent years, some issues have gained importance in the stress testing programmes and need to be incorporated and properly defined, such as the role of reverse stress testing in recovery planning. Moreover, new individual risk categories are covered. In addition, business models, data aggregation, the links between solvency stress tests and liquidity stress tests and other concepts were updated as 2010 GL32 became outdated and did not reflect best industry practices.

The institution's stress testing section focuses on the overarching principles of governance including: (a) stress testing governance structures and their use including the application of the guidelines on internal governance of stress testing; (b) data infrastructure, in particular data aggregation capabilities and reporting practices; (c) stress testing scope and coverage, taking into account a multi-layered approach from simple portfolio-level and individual risk level stress testing to comprehensive institution-wide stress testing; (d) possible methodologies including the importance of undertaking both simple sensitivity analyses and more complex scenario stress testing, the severity of scenarios, and highlighting the importance of qualitative and quantitative approaches to reverse stress testing; (e) a range of, non-exhaustive, individual risk categories to take into account in relation to stress testing with the aim of enhancing risk management and capital planning and liquidity processes; (f) the application of stress testing programmes, including the interaction between the outputs of stress tests and management actions and the application for recovery and resolution purposes, and the use of stress tests to assess the viability of the institution's capital plan in adverse circumstances in the context of ICAAP and ILAAP.

The principle of proportionality applies to all aspects of these guidelines, including the methodology, as well as the frequency and the degree of detail of the stress tests. These guidelines also recognise the principle of proportionality by describing both quantitative and qualitative aspects of stress testing. Examples of proportionality are provided in some sections when applying these guidelines to firms of different size, complexity or business model, as appropriate.

The proportionality principle is invoked in these guidelines to discuss the level of sophistication of the stress testing methodologies, practices and infrastructure required in relation to the size, structure and internal organisation (also taking into account the nature, scope and complexity of activities) of an institution. The competent authority may calibrate its application of these guidelines on the basis of proportionality, for example with respect to the SREP category to which an institution belongs.

Thus, these guidelines are applicable in their entirety to Category 1 (systemically-important) institutions. Category 2 (less or non-systemic) institutions' compliance with the guidelines is calibrated in accordance with their size and the features and complexity of their activities; particular attention is paid to their domestic or cross-border, simple or multiple business line of their activities, characteristics which need to be reflected in their stress testing.

For Category 3 and 4 institutions (small and medium institutions) calibration on the basis of proportionality dictates that the guidance provided in these guidelines is followed to the extent that they are proportionate and relevant to their activities, resources and the risk posed to the financial system. The scope of the stress testing for these institutions is therefore limited, reflecting the reduced scope of their activities and limited risk to the system overall.

Proportionality criteria should also apply to portfolio-level stress tests based on the complexity and relative size of the portfolio under consideration. For deciding which portfolios need portfolio stress tests also the overall risk situation should be taken into account. Nevertheless, no portfolio can be left out when assessing the overall risk situation or conducting a combined stress test as smaller risks in lesser important portfolios may sum up to an important risk when addressing the whole institution.

Parent institutions (including EU parents) are expected to implement these guidelines and set up stress testing programmes covering their respective consolidated level and, where applicable, material entities and/or business lines subject to the principles of proportionality, materiality and relevance.

4. Draft guidelines

EBA/GL-REC/20XX/XX

DD Month YYYY

Draft Guidelines

on institution's stress testing

1. Compliance and reporting obligations

Status of these guidelines

1. This document contains guidelines issued pursuant to Article 16 of Regulation (EU) No 1093/2010[2]. 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 set the EBA view of appropriate supervisory practices within the European System of Financial Supervision or of how 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/201x/xx'. 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.

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

[2] 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).

2. Subject matter, scope and definitions

Subject matter and scope of application

5. These guidelines aim at providing common organisational requirements, methodologies and processes for the performance of stress testing by institutions as part of their risk management processes ('institution's stress testing');

6. Within the context of groups, these guidelines apply also to institutions participating in a particular stress testing exercise in accordance with the perimeter of application of that particular stress testing exercise and the level of application set out in Articles 108 and 109 of Directive 2013/36/EU.

7. The terms 'institution' and 'institution-specific' shall be deemed to refer to an institution on a solo basis, or to the parent institution in a given perimeter of application of a particular stress test exercise or to the parent institution in a Member State or to the EU parent institution on the basis of the relevant consolidated situation as referred to in Article 4 (1) (47) of Regulation (EU) No 575/2013.

Addressees

8. These guidelines are addressed to competent authorities and institutions 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/ Taxonomy

9. Unless otherwise specified, terms used and defined in Regulation (EU) No 575/2013 and in Directive 2013/36/EU have the same meaning in these guidelines. In addition, for the purposes of these guidelines, the following definitions apply:

(1)	Solvency stress test	means the assessment of the impact of certain developments, including macro- or micro-economic scenarios on the overall capital position of an institution, including on its minimum or additional own funds requirements, by means of projecting the

	institution's capital resources and requirements, highlighting the institution's vulnerabilities and assessing its capacity to absorb losses and the impact on its solvency position;
(2) Liquidity stress test	means the assessment of the impact of certain developments, including macro- or micro-economic scenarios from a funding and liquidity perspective and shocks on the overall liquidity position of an institution, including on its minimum or additional requirements;
(3) Bottom-up stress test	means a (solvency or liquidity) stress test with all of the following characteristics: i. it is carried out by institutions using their own internally developed models; ii. it is based on institutions' own assumptions or scenarios, with possible conservative constrains by authorities; iii. it is based on the institution's own data and potentially high level of data granularity, with possible use of external data for some additional information; iv. it concerns particular portfolios or the institution as a whole, producing detailed results on the potential impact of exposure concentrations, institution linkages and contagion probabilities to the institution's loss rates;
(4) Top-down stress test	means a (solvency or liquidity) stress test, with all of the following characteristics: i. it is carried out by competent authorities or macro-prudential authorities; ii. it is based on general or systemic (macro-prudential) assumptions or scenarios designed by competent or macro-prudential authorities and applicable to all relevant institutions; iii. competent authorities or macro-prudential authorities

		manage the process and calculate the results with less involvement of the institutions than in the case of the bottom-up stress test; iv. it is based mostly on aggregate institution data and less detailed information, depending on the assumptions of the stress test, or sometimes based on more detailed institution data if decided by authorities; and v. it enables a uniform and a common framework and comparative assessment of the impact of a given stress testing exercise across institutions;
(5)	Static balance sheet assumption	means a methodological assumption according to which the impact of the stress test scenarios is to be measured on the assumption of a 'constant balance sheet' and of an 'unchanged or stable business model' throughout the projection period, enhancing the comparability of the results across institutions, thereby: i. prohibiting from taking into account, for the calculation of the impact of the scenarios, changes in the assets and liabilities of the institution that derive, indicatively, from management actions, increases or work-outs of existing lending or difference in maturities or other characteristics of these assets or liabilities (despite the application of the stress test methodology which might lead to changes in the size and the composition of the balance-sheet, and particularly the capital base, over the projection period due to, for example, new defaults, impairments, increase of stock or value adjustments of financial assets); ii. permitting the inclusion of new assets and liabilities as far as these new items bear the same main characteristics (maturities, risk profiles, etc.) with the excluded ones;
(6)	Dynamic Balance Sheet assumption	means a methodological assumption according to which the impact of the stress test scenario is to be measured on the possibility of a non-constant balance sheet and of an evolving

	business model throughout the projection period. Under the Dynamic Balance Sheet Assumption, the outcome of the stress test reflects a combination of the scenario imposed and the responsive actions taken by the management reducing the comparability of the results across institutions. The extent of responsive actions taken by the management may be constrained or unconstrained (e.g. interventions planned from the start and independent from the scenario and/or conditional on the stress test scenario);
(7) Portfolio level stress test	means a stress test of individual or several portfolios with the focus on the implications of the shocks from a single or multiple risk factors;
(8) Sensitivity analysis	means a stress test that measures the potential impact of a specific single risk factor or simple multi-risk factors, affecting capital or liquidity, to a particular portfolio or to the institution as a whole;
(9) Scenario analysis	means the assessment of the resilience of an institution or of a portfolio to a given scenario which comprises a set of risk factors, which should have all of the following characteristics: i. aligned in an internally consistent way; ii. the risk factors forming the relevant set presuppose the simultaneous occurrence of forward-looking events covering a range of risks and business areas; and iii. the set of risk factors aims at also revealing to the maximum extent possible the nature of linked risks across portfolios and across time, system-wide interactions and feedback effects;
(10) Reverse stress test	means an institution stress test which starts from the identification of the pre-defined outcome (e.g. points at which an institution business model becomes unviable, or at which the institution can be considered as failing or likely to fail in the meaning of Article 32 of Directive 2014/59/EU) and then explores scenarios and circumstances that might cause this to occur. Reverse stress testing should have one or more of the following characteristics:

	i. it is used as a risk management tool aimed at increasing the institution's awareness of its vulnerabilities by means of the institution explicitly identifying and assessing the scenarios (or combination of scenarios) that result in a pre-defined outcome; ii. the institution decides on the kind and timing (triggering events) of management or other actions necessary both a) for rectifying business failures or of other problems; and b) for aligning its risk appetite with the actual risks revealed by the reverse stress testing; iii. specific reverse stress testing can be also applied in the context of recovery planning (e.g. reverse stress tests applied in a wider context can be used to inform a recovery plan stress test by identifying the conditions under which the recovery might need to be planned);
(11) Second round or feedback effects	means the spillover effects (the nature of feedback effects is not limited to macroeconomic effects) caused by the responses of individual institutions to an external original shock, which – in aggregate –amplify such original shock, thereby causing an additional negative feedback loop;
(12) Severity of scenario	means the degree of severity of the assumptions or the deterioration of the scenario (from baseline to adverse scenario) expressed in terms of the underlying macroeconomic and financial variables (or any other assumptions). Greater severity of the scenario, in general, translates to larger impact of the stress test on the institution, thereby determining the actual severity of the stress test;
(13) Plausibility of scenario	means the degree to which a scenario can be regarded as possible to materialise in respect of the consistency of the relationship of that scenario with the current macroeconomic and financial variables, the support of the scenario by a coherent narrative and the backing of the scenario by probability distribution and historical experiences. Plausibility is not restricted to historical experiences, and hence expert judgments that take into account changing risk environments

	(e.g. observed structural breaks) and stress events that were observed in similar risk environments outside the institution's own direct historical experience should play a key role;
(14) Anchor scenario	means a type of scenario usually designed by a competent authority to set the severity standard for a particular stress test, which is imposed on institutions, either as the scenario that should be applied in the stress test, or as a severity benchmark for the development of the institution's own scenarios;
(15) Risk data aggregation	means defining, gathering and processing risk data according to the institution's risk reporting requirements to enable the institution to measure its performance against its risk tolerance/appetite. This includes sorting, merging or breaking down sets of data;
(16) Data infrastructure	means physical and organisational structures and facilities to build and maintain data and IT architecture to support institution's risk data aggregation and risk reporting internal policy.

3. Implementation

Date of application

10. These guidelines apply from XX/XXX/XXXX[2 months from the date of publication of the guidelines in all EU official languages. The final factual date ('dd month year') will be inserted the day of the publication on the EBA website].

Repeal

11. The following guidelines are repealed with effect from the date of publication of these guidelines in all EU official languages.

    - *CEBS Guidelines on Stress Testing (GL 32)*[3]

[3] https://www.eba.europa.eu/documents/10180/16094/ST_Guidelines.pdf

https://www.google.co.uk/search?q=-+CEBS+Guidelines+on+Stress+Testing+(GL+32)&oq=-+CEBS+Guidelines+on+Stress+Testing+(GL+32)&aqs=chrome..69i57j0.947j0j8&sourceid=chrome&ie=UTF-8

4. Institution's Stress Testing

4.1 Stress testing programme

12. Institutions should have in place a stress testing programme that should cover at least the following:

    a) the types of stress testing and their main objectives and application;

    b) the frequency of the different stress testing exercises;

    c) the internal governance regime with clear responsibilities and procedures;

    d) in case of a group, the scope of the entities included and the coverage (e.g. risk types and portfolios) of the stress tests;

    e) the methodological details, including models used and possible links between liquidity stress tests and solvency stress tests, namely the respective magnitude of such dynamic interaction and capture of feedback effects;

    f) the range of assumptions, including business and managerial, and remedial actions envisaged for each stress test; and

    g) the relevant data infrastructure.

13. Parent institutions in a Member State and EU parent institutions should also develop a group stress testing programme to be approved and monitored by their senior management and management body in the context of their centralised risk management policy. The group stress testing programme should include and address to the extent appropriate all institutions subject to consolidation.

14. The group institutions should, when establishing their individual stress testing programme, take into account the relevant group stress testing programme.

15. Institutions should also include reverse stress testing and the respective scenarios in their stress testing programme.

16. Institutions should ensure that their stress testing programmes are workable and feasible and inform the decision making at all appropriate management levels about all existing and potential material risks.

17. Institutions should regularly assess their stress testing programme to determine its effectiveness, robustness and should update it as appropriate. The assessment should be made at least on an annual basis, on the basis both of a quantitative and a qualitative analysis

and should fully reflect the changing external and internal conditions. Institutions should ensure that the frequency of the assessment takes into account the frequency of the corresponding stress test applications.

18. Institutions should ensure that their quantitative analysis in accordance with the previous paragraph includes sound backtesting tools to validate the assumptions, parameters and results of stress testing models (e.g. credit risk models, market risk models, pre-provision net revenue models); institutions should ensure that their qualitative analysis in accordance with the previous paragraph has recourse to expert judgements or benchmarking assessments.

19. When assessing the stress testing programme, institutions shall consider at least the following:

    a) the effectiveness of the programme in meeting its intended purposes;

    b) the need for improvements;

    c) the identified risk factors, definitions and reasoning for relevant scenarios, model assumptions and sensitivity of results to these assumptions, as well as the role of expert judgement to ensure that it is accompanied with sound analysis;

    d) the model performance, including its performance on out-of-sample data, i.e. on data which was not used for model development;

    e) how to incorporate possible solvency-liquidity adverse loops;

    f) the adequacy of possible interlinkages between solvency stress tests and liquidity stress tests;

    g) feedback received from competent authorities in the context of their supervisory or other stress tests;

    h) the adequacy of the data infrastructure (systems implementation and data quality);

    i)the proper level of involvement of senior management and management body;

    j) all assumptions including business and/or managerial assumptions, and management actions envisaged, based on the purpose, type and result of the stress testing, including an assessment of the feasibility of management actions in stress situations and a changing business environment; and

    k) the adequacy of the relevant documentation.

20. The institution's stress testing programme should be appropriately documented for all types of stress tests carried out at the single risk type and/or portfolio level, as well as firm-wide level. Documentation should at least cover:

    a) the stress testing approach;

    b) the possible interlinkages between solvency stress tests and liquidity stress tests, namely a mapping between: the deterioration on capital position (solvency) and ability to issue commercial paper and bonds (liquidity), macro-driven probabilities of default

shifts (solvency) and implied rating migration of banks unencumbered assets and effect on collateral deposited at respective central bank (liquidity), the increase in expected non-performing loans (solvency) and reduction in expected inflows from loan repayments or from non-financial corporation bonds (liquidity), or a possible liquidity gap (liquidity) and asset fire sales (solvency), and increase in funding costs (liquidity) and P&L effects (solvency);

c) the roles and responsibilities as determined in the internal policy and processes at least for the performance of the stress testing programme;

d) a description of the entire process of designing, approving, performing, monitoring the performance and periodically assessing the stress testing programme and its outcomes;

e) a description of the processes for evaluating stress test outcomes, including details of areas with manual or judgemental parts, also of the process for using the results for informing management actions and the strategy of the institution; and

f) a description and inventory of the relevant IT applications.

21. The stress testing programme should be challenged across the organisation. Business units not responsible for the design and application of the programme and/or non-involved external experts should play a key role in the assessment of this process, taking into account the respective expertise for specific subjects.

22. Institutions should ensure, both for the initial design and for the assessment of the stress testing programme, that an effective dialogue has taken place with the involvement of experts from all business areas of the institution and that the programme and its updates has been properly reviewed by the senior management and management body of the institution who are also responsible for monitoring its execution.

4.2 Governance aspects of stress testing

23. Institutions should ensure that their management body has the ultimate responsibility for approving the stress testing programme of the institution and monitoring its performance.

24. Institutions should ensure that their management body is able to fully understand the impact of stress events on the overall risk profile of the institution.

25. Institutions should ensure that their management body holds an understanding of the material aspects of the stress testing programme that enables it to: (a) actively engage in discussions with stress testing committees of the institutions, where applicable, or with senior management or external consultants responsible for stress testing; (b) challenge key modelling assumptions, the scenario selection and the assumptions underlying the stress tests in general; and (c) decide on the necessary management actions and discuss them with the competent authorities.

26. The execution of stress testing programme should be made in accordance with the relevant internal policies and procedures of the institution. The management body of the institutions should ensure that clear responsibilities and resources are assigned for the execution of the programme.

27. Institutions should ensure that all elements of the stress testing programme including its assessment are appropriately documented and regularly updated, when relevant, in the internal policies and procedures.

28. Institutions should ensure that the stress testing programme is also used as an effective internal communication tool across business lines and managements levels, with a view to raise awareness and instigate discussions on existing and potential risks as well as on possible management actions.

29. The stress testing programme should be an integral part of an institution's risk management framework (including in the context of ICAAP and ILAAP). Stress tests should support different business decisions and processes as well as strategic planning, including capital and liquidity planning. The decisions should take into account the shortcomings, limitations and vulnerabilities during stress testing.

30. Institutions should ensure that their management body evaluates the outcomes of the stress tests and takes them into account, in particular with regard to identified limitations, vulnerabilities and shortcomings detected, when approving the strategic planning of the institution and when taking all relevant decisions affecting capital, liquidity, recovery and resolution planning.

31. The outputs of stress tests should be used as an input to the process of establishing an institution's risk appetite and limits. Further, they should act as a planning tool to determine the effectiveness of new and existing business strategies and their impact on the use of capital. To enable that, the essential outputs from a stress testing exercise should be implied losses, capital and liquidity requirements as well as available capital and liquidity.

32. To be a meaningful part of the risk management system of an institution, stress tests should be undertaken with appropriate frequency. This frequency should be determined having regard to the scope and type of the stress test, the size and complexity of institutions (proportionality principle), portfolio characteristics as well as changes in the macroeconomic environment or the institutions business activities.

4.3 Data Infrastructure

33. Institutions should ensure that the stress testing programme is supported by an adequate infrastructure.

34. To ensure that a proper data infrastructure has been put in place, institutions, including those that are not G-SIIs, should endeavour to refer also to the extent appropriate, to the principles

for effective risk data aggregation and risk reporting of the Basel Committee on Banking Supervision principles for effective risk data aggregation and risk reporting[4].

35. Institutions should ensure that their data infrastructure has the capacity to capture the extensive data needs of their stress testing programme and that they have in place mechanisms to ensure their continuing ability to conduct stress testing as planned in accordance with the programme.

36. Institutions should ensure that the data infrastructure allows for both flexibility and appropriate levels of quality and control.

37. Institutions should ensure that their data infrastructure is proportionate to their size, complexity, risk and business profile and allows for the performance of stress tests covering all material risks where an institution is exposed to.

38. Institutions should ensure that they devote adequate human, financial and material resources at each management level, including at the level of the senior management and management body, to guarantee the effective development and maintenance of their data infrastructure, IT systems included.

39. Institutions should consider stress testing data infrastructure also as part of their overall IT infrastructure and should give adequate consideration in business continuity planning, identification of long term investments and other IT processes.

Data aggregation capabilities for stress testing purposes

40. In order to conduct reliable stress tests, institutions should maintain and keep up to date accurate and reliable risk data. Institutions should also have in place a dedicated process for aggregating and producing such data.

41. Institutions should ensure that their aggregation of risk data is characterised by accuracy and integrity, completeness, timeliness, and adaptability.

42. Institutions should ensure the accuracy and integrity of the risk data. They should also ensure that data is aggregated on a largely automated basis so as to minimise the probability of error. In particular, a thorough reconciliation and controls system should be in place.

43. Institutions should have the capacity to guarantee the completeness of risk data. For that purpose, institutions should ensure that risk data also fully captures off-balance sheet risks and are easily attainable at any level of the institution. Materiality, in terms of current and potential risk should be factored in.

[4] http://www.bis.org/publ/bcbs239.pdf

44. An institution should be able to produce aggregate risk information on a timely basis to meet all reporting requirements throughout the process of stress testing following different quality assurance and challenge stages; for that purpose, institutions should develop an efficient structure that ensures timeliness.

45. Institutions should be able to generate aggregate data to meet a broad range of on-demand requests both arising from internal needs in the institution and externally from supervisory queries.

Reporting practices for stress testing purposes

46. Institutions should ensure that their risk reporting process: (a) is completely supported by data aggregation capabilities; (b) accurately and precisely conveys aggregated risk data and reflects risk in an exact manner; (c) covers all material risks and, in particular, that it allows the identification of emerging vulnerabilities that could be potentially further assessed even in the same stress testing exercise; (d) offers or is able to offer additional information regarding main assumptions, tolerance levels, or caveats; (e) communicates information in a clear and concise manner including meaningful information tailored to the needs of the recipients.

4.4 Stress testing scope and coverage

4.4.1 General Requirements

47. Stress tests should take into account all types of material risk having regard to both on- and off-balance sheet assets and liabilities of an institution including relevant structured entities.

48. Stress tests should capture risks at various levels in an institution. In this regard, according to the proportionality principle, the scope of stress testing may vary from simple portfolio level sensitivity or individual risk level analyses to comprehensive institution-wide scenario stress testing.

49. Stress tests should take into account changes in correlations between risk types and risk factors, at individual entity and at a group-wide level. They should also take into account that correlations tend to increase during times of economic or financial distress.

4.4.2 Portfolio and individual risk level stress testing

50. Institutions should perform stress tests on an individual portfolio basis, covering all risk types that affect these portfolios, using both sensitivity and scenario analysis. Institutions should also identify risk factors and their adequate level of stress, wherever possible, at the level of an individual portfolio.

51. Institutions should ensure that they stress test portfolios and business lines or units to identify intra- and inter-risk concentrations – i.e. of common risk factors within and across risk types (including contagion effects).

52. In particular, when considering inter-risk concentrations, institutions should aggregate across risk types notably market and credit risk, to gain a better understanding of their potential risk concentrations in a stress. Institutions should identify potential links between exposures which could be risky during economic or financial distress as well as question assumptions about dependencies and correlations between risk types in a stress situation.

4.4.3 Institution-wide stress testing

53. In order to deliver a complete and holistic picture of the institution's risks, in addition to stress tests on the level of single entities, stress testing should be conducted also on a group level and across portfolios and individual risk types.

54. It should be taken into account that: (a) risks at the institution-wide level may not be well reflected by simple aggregation of stress tests on portfolios, individual risk areas or business units of the group; (b) correlations, offsetting of individual exposures and concentrations may either lead to double counting of risks or to an underestimation of the impact of stressed risk factors; and (c) specific group risks may arise at the institution-wide level. Therefore, institutions should ensure that all material risks and their respective risk factors are also to be identified at an institution wide level. When looking at risks at an institution-wide level particular attention should be paid to risk concentrations on a holistic basis.

55. A group or an institution which is internationally active should also perform stress tests at the level of business units in specific geographic regions or business sectors or business lines to account for differing risk factors in different businesses and regions.

4.5 Proportionality

56. In accordance with the principle of proportionality, an institution's stress testing programme should be consistent with its individual risk profile and business model.

57. Institutions should take into account their size, internal organization and the nature, scale and complexity of their activities when developing and implementing an institution's stress testing programme. Significant institutions and more complex institutions and groups should have more sophisticated stress testing programmes, while small and less complex institutions and groups may implement simpler stress testing programmes.

58. For the purpose of the application of the principle of proportionality and in order to ensure an appropriate implementation of the requirements , the following criteria should be taken into account by institutions and competent authorities:

    a) the size in terms of the balance sheet total or the quantity of assets held by the institution or its subsidiaries within the scope of prudential consolidation;

b) the geographical presence of the institution and the size of the operations in each jurisdiction;

c) the legal form and whether the institution is part of group and, if so, the proportionality assessment done for the group;

d) whether the institution is listed or not;

e) whether the institution is authorised to use internal models for the measurement of capital requirements (e.g. Internal Rating Based Approach);

f) the type of authorised activity and services (e.g. loans and deposits, investment banking);

g) the underlying business model and strategy; the nature and complexity of the business activities , the organisational structure;

h) the risk strategy, risk appetite and actual risk profile of the institution, take into account also the result of the annual capital adequacy assessment;

i) the ownership structure and funding structure of the institution;

j) the type of clients (e.g. retail, corporate, institutional, small businesses, public entity) and the complexity of the products or contracts;

k) the outsourced activities and distribution channel;

l) the existing IT systems, including IT continuity systems and outsourcing activities in this area e.g. cloud computing.

4.6 Stress testing types

4.6.1 General requirements

59. The specific design, complexity and level of detail of the stress test methodologies should be appropriate to the institutions size as well as the complexity and riskiness of its business activities. It should take into account the strategy and business model as well as the portfolio characteristics of the institution.

60. Institutions should take into account the stage within the economic cycle when designing stress test methodologies, including the scenario and the need for possible management actions.

61. Institutions should identify appropriate, meaningful and robust mechanisms for translating risk factors into relevant internal risk parameters (e.g. PD, LGD, write-offs, fair value haircuts etc.) that provide an institution and group view of risks.

62. The link between stressed risk factors and the risk parameters should not only be based on institutional historical experience and analysis, but should be supplemented, where available

and appropriate, by benchmarks from external sources and when possible from supervisory guidance.

63. Due to the complexity involved in modelling hypothetical and macro-economic based risk factors/scenarios, institutions should be aware of the model risk involved and ensure that the following have been performed when setting those factors/scenarios:

    a) a regular and sufficiently conservative expert review of the model's assumptions and mechanics has been performed and a conservative modelling approach to account for model risk has been followed;

    b) a sufficient degree of conservatism as appropriate has been applied when making assumptions that are hard to measure in a quantitative way (e.g. diversification; exponential growth projected, fees projected, forward-looking management views) but may have an impact on the model's outputs (e.g. pre-provision net revenue model's outputs should be based on sufficient statistical support as well as business considerations); and

    c) the dependencies and sensitivities of the results on the assumptions have been acknowledged and their impact is assessed on a regular basis.

64. Shortcomings of models and mechanisms which link risk factors with losses or increased risk parameters should be understood, communicated clearly and taken into account when interpreting results. Models should take into account the interactions between solvency and funding liquidity and funding costs in order to not systemically and significantly underestimate the impact of a shock. Where possible, results for different modelling approaches should be compared (e.g. for pre-provision net revenue models, a comparison between the model used and other possible approaches and the rationale for their rejection should be available). These links should be based on robust statistical models. However, if data availability or quality or structural breaks in historical data do not allow for meaningful estimates (e.g. for pre-provision net revenue models it is necessary historical data covering an interest rate cycle and a business cycle, as well as information on changes in business strategy and organisation structure), quantitative analyses should be supported with qualitative expert judgements.

65. Institutions should assess possible non-linear interactions between risk factors and stressed risk parameters.

4.6.2 Sensitivity analysis

66. Institutions should conduct sensitivity analyses at the level of individual exposures, portfolios or business units, institution-wide, and for specific risk-types as proportionate to their complexity. Institutions should assess at which aggregation level sensitivity analyses are meaningful or even feasible. The use of expert judgements should be clarified in detail whenever applicable.

67. Institutions should identify relevant risk factors at various levels of application of prudential requirements and across different portfolios, business units and geographical location. Institutions should ensure that all relevant types of risk factors are covered, including macro-economic and macro-financial variables, statistical aspects of risk parameters (such as volatility of PDs) and idiosyncratic factors such as operational risks.

68. The institutions should stress the identified risk factors using different degrees of severity as an important step in their analysis to reveal nonlinearities, threshold effects, i.e. critical values of risk factors beyond which stress responses accelerate.

69. Where there are uncertainties about the robustness of estimated dependency between macro-economic/macro-financial risk factors and risk parameters or a need to validate the results of more comprehensive scenario analyses, institutions should endeavour to ensure that sensitivity analyses is also carried out by stressing statistical aspects of portfolio risk parameters according to historical distributions supplemented by hypothetical assumptions (e.g. with respect to future volatilities).

70. Single risk factor analysis should be supplemented by simple multi-risk factor analyses, where a combined occurrence is assumed, without necessarily defining a scenario.

71. Institutions should maintain a list of identified risk factors.

4.6.3 Scenario analysis

72. Institutions should ensure that the scenario analysis is a core part of their stress testing programme.

73. The design of the stress test scenarios should not only be based on historical events, but should also consider hypothetical scenarios, also based on non-historical events. Institutions should ensure that scenario designs are forward-looking and take into account systematic and institution-specific changes in the present and foreseeable future. For that purpose, institutions should endeavour to have recourse to external data from similar risk environments relevant for institutions with similar business models. Institutions should use data that is relevant and available. Relevant data may be internal and/or external and incorporate benchmarking and supervisory guidance.

74. A range of scenarios should be considered encompassing different events and degrees of severity when meaningful or even feasible.

75. Institutions should ensure that their stress test scenarios meet at least the following requirements:

    a) address the main risk factors which the institution may be exposed to. In this regard the results obtained from single risk factor analyses, which aim at providing information about the sensitivity towards single risk factors, should be used to identify scenarios that

include a stress of a combined set of highly plausible risk factors. No material risk factor should be left unstressed or unconsidered;

b) address major institution-specific vulnerabilities, deriving from the regional and sectoral characteristics of an institution, as well as its specific product or business line exposures and funding policies: concentration and correlation risks, both of an intra- and of an inter–risk type, should be identified a priori;

c) include a coherent narrative for the scenario, covering all relevant risk factors as well as their (forward-looking) development on the basis of multiple trigger events (i.e. monetary policy, financial sector developments, commodity prices, political events and natural disasters). Institutions should ensure that the narrative scenario is plausible and non-contradictory when assuming the co-movement of risk factors and the corresponding reaction of market participants. Where certain risk factors are excluded from the narrative scenario, institutions should ensure that this exclusion is fully justified and documented;

d) are internally coherent, so as to ensure that the identified risk factors behave consistently with other risk factors in a stress and that they contain explicit estimates and assumptions on the dependence structure among the main underlying risk factors;

e) take into account innovation and more specifically technological developments or sophisticated financial products without disregarding their interaction with more traditional products; and

f) ensure that stressed risk factors translate into internally consistent risk parameters.

76. Institutions should determine the time horizon of stress testing in accordance with the aim of the exercise, characteristics of the portfolio of the institution such as maturity and liquidity of the stressed positions, where applicable, as well as the risk profile. Solvency stress testing and liquidity stress testing require different time horizons and scenarios.

77. Institutions should ensure that:

a) stress tests explicitly take into account dynamic interdependences, e.g. among economic regions and among economic sectors, including the financial sector;

b) the overall scenario takes into account system-wide dynamics, e.g. closure of certain markets, risk concentrations in a whole asset class (e.g. mortgages);

c) adverse feedback dynamics caused by factors such as interactions among valuations, losses, and margining requirements are covered.

78. Institutions should make qualitative assessments of second round or feedback effects of stress at individual level, where appropriate and in particular if no robust quantitative estimates can be established. For instance, an individual institution might create some price or volume adjustments to take into account some strategic effects (e.g. level of lending strategy) and respond endogenously to the scenario.

4.6.4 Severity of scenarios

79. Institutions should ensure that stress testing is based on severe but plausible scenarios and the degree of severity should reflect the purpose of the stress test. To that end stress tests should be:

    a) meaningful in terms of addressing relevant risks to the institution with a view to promoting the stability of the institution under adverse conditions and, in the case of systemically important banks, also the financial system at all points in the economic cycle and over market fluctuations including funding markets; and

    b) consistently applied across the institution, recognising that the impact of identical scenarios is not necessarily severe for all business lines.

80. Institutions should ensure that various degrees of severity are considered for both sensitivity analysis and scenario stress testing covering at least one severe economic downturn for the assessment of capital adequacy and capital planning purposes.

81. Institutions should ensure that severity is set taking into account the specific vulnerabilities of each institution to a given scenario on the basis of its business model (e.g. exposed to international markets). Institutions should develop own scenarios and not be dependent on scenarios from the supervisors. When assessing the severity of a scenario the institution should be aware of the dynamics of risk environments and of experiences of institutions with similar business models.

82. Institutions should ensure that their scenarios assess absolute and relative changes of risk factors. In an absolute scenario the degree of severity should be a direct change of the risk factor and not depend on the current level. In a relative scenario the degree of severity should depend on the current level and economic situation (e.g. GDP growth decreases by 2%, i.e. a relative change to the absolute level). For example, will a 2% negative relative change in GDP from a starting point with a substantial positive output-gap (i.e. current GDP is substantial above structural GDP) not necessarily lead to a severe stress effect on GDP in absolute/level terms. Likewise, the worse the current economic situation at the outset the more severe the stress of a relative scenario. Institutions should ensure that their choice of the scenario is sufficiently severe in both relative and absolute terms. Both the choice and its impact on the degree of severity should be justified and documented.

83. For assessing the appropriate degree of severity of scenarios, institutions should also compare them with the scenarios outlined in their reverse stress testing.

4.6.5 Reverse stress testing

Requirements

84. Institutions should perform adequate reverse stress tests as part of the stress testing programme, sharing the same governance, an effective infrastructure and quality standards,

and to complement other types of stress testing, taking into account the nature, size, scale, and complexity of their business activities and risks. The reverse stress testing should be clearly defined in terms of responsibilities and resources allocated and should be supported by an infrastructure that it is suitable and flexible and by written policies and procedures. Reverse stress testing should be carried out regularly by all types of institutions and at the same level of application as ICAAP and ILAAP (e.g. institution-wide and covering all relevant risk types).

85. Institutions should include scenarios identified through the reverse stress tests to complement the range of stress tests scenarios they undertake and for comparison purposes in order to assess the overall severity, allowing the identification of severe but still plausible scenarios. The reverse stress testing should be useful to assess the severity of scenarios for ICAAP and ILAAP stress tests. The severity of reverse stress testing scenarios can be also assessed by comparing it inter alia to historical or other supervisory and publically available scenarios.

86. In carrying out their reverse stress tests, institutions should also consider whether failure of one or more of its major counterparties or a significant market disruption arising from the failure of a major market participant (in a separate or combined manner) would cause the pre-defined outcome.

Use of reverse stress testing

87. Institutions should use reverse stress testing as a regular risk management tool in order to improve their awareness of current and potential vulnerabilities, providing added value to an institution's risk management. Institutions should also consider that the pre-defined outcome of reverse stress testing can be produced by some other circumstances different that the one analysed in the stress test.

88. As part of their business planning and risk management, institutions should use reverse stress test to understand the viability and sustainability of their business model and strategies, as well as to identifying circumstances where they might be in the situation considered as failing or likely to fail in the meaning of Article 32 of Directive 2014/59/EU. It is important that institutions identify indicators that provide alerts when a scenario turns into reality. To that end, institutions should:

    a) identify the pre-defined outcome to be tested (e.g. of business model becoming unviable);

    b) identify possible adverse circumstances which would expose them to severe vulnerabilities and cause the pre-defined outcome;

    c) assess (depending on the institution's size as well as the nature, scale, complexity and riskiness of its business activities) the likelihood of events included in the scenarios leading to the pre-defined outcome; and

    d) adopt effective arrangements, processes, systems or other measures to prevent or mitigate identified risks and vulnerabilities.

89. Institutions should use reverse stress testing in planning and decision making and to challenge their business models and strategies in order to identify and analyse what could possibly cause their business model to become unviable such as assessment of both the ability to generate returns over the following months and the sustainability of the strategy to generate returns over a longer period based on strategic plans and financial forecasts. The engagement of the Board and senior management throughout the process is expected.

90. Where reverse stress test reveals that an institution's risk of business model failure is unacceptably high and inconsistent with its risk appetite, the institution should plan measures to prevent or mitigate such risk, taking into account the time that the institution should have to react to these events and implement those measures. As part of these measures, the institution should consider if changes to its business model are required. These measures derived from reverse stress testing, including any changes to the institution's business plans, should be documented in detail in the institution's ICAAP documentation.

91. Institutions with particular business models, e.g. investment firms, should use reverse stress testing to explore their vulnerabilities to extreme events, in particular where their risks are not sufficiently captured by more traditional (e.g. solvency and liquidity) stress scenarios based on macroeconomic shocks.

92. Institutions using internal models for credit risk, counterparty credit risk, and market risk, when carrying out reverse stress testing in accordance with Articles 177, 290(8) and 368(1) (g) of Regulation (EU) No 575/2013, should endeavour to identify severe, but plausible, scenarios that could result in significant adverse outcomes and potentially challenge institutions overall viability. Institutions should see these reverse stress tests as an essential complement of their internal models for calculation of capital requirements and as a regular risk management tool for revealing the possible inadequacies of these internal models. In severe stress scenarios, even if should not be necessarily taken as an indication that the modelling of the inputs into the IRB formula are inadequate, model risk will increase and may lead to a breakdown in the models predictability.

93. Institutions should perform qualitative analysis in developing a well-defined narrative of the reverse stress testing and a clear understanding of its feedback and non-linear effects, taking into account the dynamics of risk, combinations and interactions between and across risk types. When developing a well-defined narrative, the institutions should consider external exogenous events like economic events, industry crash, political events, litigation cases or natural events, as well as risk factors such as operational risks, concentration and correlations, reputational and loss of confidence among other risk factors, and the respective combination of events and factors. A proper engagement of the management body of the institution on the discussions of the narrative is fundamental, taking into account possible specific vulnerabilities or the impact on whole institution.

94. Institutions should perform a quantitative and more sophisticated analysis, taking into account the institution's size as well as the nature, scale, complexity and riskiness of its

business activities, in setting out specific loss levels or other negative impacts on their capital, liquidity (e.g. the access to funding, in particular to increases on funding costs) or overall financial position. Institutions should work backwards in a quantitative manner to identify the risk factors, and the required amplitude of changes, that could cause that loss or negative impact (e.g. defining the appropriate loss level or some other measure of interest on the balance sheet of the financial institution such as capital ratios or funding resources). Institutions should understand and document in detail the drivers of risk (e.g. outputting the exact factor draws that had the most impact on the portfolio tail region), the key business lines and a clear and consistent narrative around weaknesses and the respective scenarios (e.g. about the underlying assumptions and sensitivity of the results to those assumptions over time) that cause the pre-defined outcome and the events chain and the likely flow through (e.g. the most important factors may be mapped to macroeconomic variables according to the combinations for a given target loss/capital in a portfolio) identifying hidden vulnerabilities (e.g. hidden correlations and concentrations) and overlapping effects.

95. Institutions should, where appropriate, use sensitivity analysis as a starting point for reverse stress testing, e.g. shifting one or more relevant parameters to some extreme to reach pre-defined outcomes. The institutions should consider various reverse sensitivity analyses for credit risk (e.g. how many large customers would have to go into default before the loss absorbing capital is lost), market risk, liquidity risk (e.g. stress on deposits in the retail sector and circumstances that would empty the institution's liquidity reserves) and operational risk, among other risks, and a combination analysis where all risk are covered simultaneously. However, institutions should not primarily use sensitivity analysis and simple metrics to find the scenario relevant for the reverse stress test. The qualitative analysis should lead to the scenario, combining expert judgment from different business areas, as thinking might be the most effective way to avoid a business model failure. A joint stressing of all relevant risk parameters using their statistical aspects (e.g. volatility of risk factors consistent with historical observations supplemented with hypothetical but plausible assumptions) should be developed. The plausibility of the required parameter shifts to reach the pre-defined outcome gives a first idea about possible vulnerabilities in the institution. To assess the plausibility historical (multivariate) probability distributions – adjusted, where deemed necessary, according to expert judgements – should among others be applied. Qualitative analyses and assessments, combining expert judgements from different business areas, should guide the identification of relevant scenarios.

96. Institutions should use reverse stress testing as a tool to gather insights into scenarios that involve combinations of solvency and liquidity stresses, where traditional modelling may fail to capture complex aspects from real situations. Institutions should use reverse stress testing to challenge their capital plans and liquidity plans. Where appropriate, institutions should identify and analyse situations that can aggravate a liquidity stress event and transform it into a solvency stress event, and vice-versa, and eventually to a business failure. Institutions should endeavour to apply reverse stress testing in an integrated manner for risks to capital or liquidity with a view to improve the understanding and the management of related risks in extreme situations.

Recovery actions and recovery planning

97. Institutions should develop scenarios of severe macroeconomic and financial distress, varying in their severity (including system-wide events, legal entity-specific stress and group-wide stress) to be used in recovery plans under BRRD Article 5(6) and EBA/GL/2014/06 and use specific reverse stress testing to develop 'near-default' scenarios (institution close to failure but no further) and as an input to inform and test the efficiency and effectiveness of their recovery actions and their recovery planning, and analyse sensitivities around respective assumptions. Such 'near-default' scenarios should identify and describe the point that would lead to an institution's or a group's business model becoming non-viable unless the recovery actions were successfully implemented. The scenarios should allow the estimation of results and respective suitability of all the available recovery options. The terminology used in the description of recovery scenarios should help to determine which recovery options were tested under particular stress scenarios. The description should have a sufficient level of detail, both through a set of quantitative assumptions and a qualitative narrative, in order to determine whether the scenario is relevant for the institution and how severe it is. The events should be described with logical sequence and the assumptions underlying the main drivers (e.g. net income, RWA, capital) should be laid down very clearly. The scenarios should also take into account a possible estimation of the cross-effects of executing different recovery plan options in the same stress scenario. The scenarios should also allow to understand how the events unfold by providing an appropriate timeline to understand at which point in time certain actions will be developed (with implications for their credibility and feasibility). The purpose of this exercise is to test the effectiveness of the institution's recovery options in restoring financial strength and viability when the institution comes under such severe stress.

98. Due to the different objectives of the two sets of reverse stress tests the stress tests for ICAAP and ILAAP purposes and recovery planning should not be interlinked but compared to one another.

99. Institutions should use reverse stress testing to assist with the development, assessment and calibration of 'near-default' scenarios used for recovery planning.

100. Institutions should use reverse stress testing to identify the risk factors and further understand and describe the scenarios that would result in 'near default', assessing effective recovery actions that can be credibly implemented, either in advance or as the risk factors or scenarios develop.

101. Reverse stress testing should contribute to the recovery plan scenarios by using a dynamic and quantitative scenario narrative:

a) the recovery triggers, i.e. at which point the institution would enact recovery actions in the hypothetical scenario;

b) the recovery actions required and their expected effectiveness, including the method of assessing that effectiveness (i.e. indicators that should be monitored to conclude that no further action is required;

c) the appropriate timing and process required for those recovery actions;

d) in case of further stress, points (b) and (c) for possibly required additional recovery actions to address residual risks.

4.7 Individual risk areas

102. Institutions should ensure the stress testing of individual risk is proportional to the nature, size and complexity of their business and risks.

103. Institutions should take into account, at individual level, the impact of second round effects in the individual risk for stress testing.

4.7.1 Credit and counterparty risk

104. Institutions should analyse at least:

a) the borrowers' ability to repay their obligations, e.g. the probability of default;

b) the recovery rate in the event of a borrower's defaulting including the deterioration of the collateral values or credit worthiness of the guarantee provider, e.g. the loss given default; and

c) the size and dynamics of credit exposure, including the effect of undrawn commitments from borrowers, e.g. the exposure at default.

105. Institutions should ensure that their institution-wide credit risk stress tests cover all their positions in their banking and trading book, including hedging positions and central clearing houses exposures.

106. Institutions should endeavour to determine specific risk factors and set out on a preliminary basis how these factors can affect its total credit risk losses and capital requirements. Institutions should endeavour to make that determination on an exposure class by exposure class basis (e.g. factors relevant to mortgages may be different to corporate asset classes).

107. Institutions should ensure that credit risk is assessed at various levels of shock scenarios from simple sensitivity analyses to institution-wide stress tests, or to group wide stress testing, in particular:

a) market wide shock scenarios (e.g. sharp slowdown of the economy which affects portfolio quality for all of the creditors);

b) counterparty specific and idiosyncratic shock scenarios (e.g. bankruptcy of biggest bank creditor);

c) sector specific and region specific shock scenarios;

d) combination of the above.

108. Institutions should subject risk factors to sensitivity analyses, which in turn should provide quantitative background for the design of scenarios.

109. Institutions should apply different time horizons when applying their stress scenarios. The time horizon should range from overnight (one-off effect) up to longer terms (e.g., creeping economic downturn).

110. When stress testing financial collateral values, institutions should identify appropriate conditions which would adversely affect the realisable value of their collateral positions including deterioration in the credit quality of collateral issuers or market illiquidity.

111. In the design of scenarios, institutions should consider the impact of stress events for other risk types, e.g. liquidity risk and market risk and the possibility of spillovers between institutions.

112. Institutions should quantify the impact of the scenario in terms of credit losses (i.e., provisions), risk exposures, income and own funds requirements. Besides institutions should be able to quantify such impact by relevant segments/portfolios.

113. Institutions should consider, wherever possible, the following relevant parameters: probability of default (PD), Loss Given Default (LGD) and Exposure at Default (EAD), expected loss (EL) and risk exposure amount and the impact on credit losses and own funds requirements.

114. For the estimation of future losses in stress tests, institutions should, where appropriate, rely on credit risk parameters different from the ones applied in the calculation of capital requirements, which are usually through-the-cycle for PD and under downturn conditions for LGD. In particular, institutions should, where relevant, apply estimates based on point in time parameters in accordance with the severity of the scenario for the purpose of estimating credit losses.

115. For the computation of Exposure at Default, institutions should also consider Credit Conversion Factor (CCF) and, in particular, the effect of the institution's legal capacity to unilaterally cancel undrawn amounts of committed credit facilities especially in stressed conditions.

116. Institutions should apply, to the extent appropriate, credit risk internal model approaches that challenge historical relations and data, and simulations of credit quality migrations among categories of exposures to provide an estimate of losses.

117. When assessing their risk to leveraged counterparties or shadow banking entities, institutions should take into account risk concentrations and they should not presume the existence of collateral or continuous re-margining agreements, which may not be available in case of severe market shocks. Institutions should endeavour to capture such correlated tail risks adequately.

4.7.2 Securitisation

118. Institutions should take into account securitisation risk that arises from structured credit products, usually created by repackaging the cash flow from a pool of assets into various tranches or asset backed securities, taking into account the different positions which institutions can have in the securitisation process, acting as originator, sponsor or investor.

119. Institutions should ensure that stress testing of securitised assets addresses the credit risk of the underlying pool of assets, including the default risk, the possibly non-linear and dynamic default correlations as well as the evolution of the collateral values. Institutions should take into account all relevant information with regard to the specific structure of each securitisation, such as the seniority of the tranche, the thickness of the tranche, credit enhancements and the granularity, expressed in terms of effective number of exposures.

120. The sensitivity to systemic market effects, impacting e.g. in liquidity dry-outs or increasing asset correlations, on all levels of the structured product should be carefully taken into account. Also the effect of reputational risks, resulting e.g. in funding issues should be assessed.

121. Stress tests should address all relevant contractual arrangements, the potential impact of embedded triggers (e.g. early amortisation provisions), the leverage of the securitisation structure and the liquidity/funding risks arising from the structure (i.e. cash-flow mismatches, prepayment conditions also in relation to interest rate changes).

122. Scenarios should consider also the default of one or more of the contractual counterparties involved in the securitisation structure, especially of those acting as guarantors of certain tranches.

123. If the institution relies on external ratings to assess the risk of securitised products, the external ratings should be critically reviewed and scenarios stressing the ratings including the rating classes' specific impairment rates should be assessed, e.g. by stressing (historical) rating transition matrices.

124. When designing the stress testing approach, institutions should consider the following: (a) the impacts of stress tests for structured credit products will materialise on the level of the asset pool in increased defaults (or PDs and LGDs, where applicable) and hence increased expected loss/impairment rates and regulatory capital requirements (as well as increased probabilities for downgrades) should be expected during shocks; and (b) that further impact may arise from decreases in the net-cash flow, increases in trading losses and value adjustments or from the deterioration of regulatory metrics such as e.g. the net-stable funding ratio.

4.7.3 Market risk

125. Institutions should take into account market risk, notably risks derived from losses resulting from adverse changes in the value of positions arising from movements in market prices across commodity, credit, equity, foreign exchange and interest rates risk factors. Interest rate risk in trading book positions should be considered by institutions as a component of market risk.

126. Institutions should conduct stress tests for their positions in financial instruments in the trading and fair value though other comprehensive income (FVOCI) portfolios (i.e. respective accounting terms to classify financial assets), including securitisation instruments/positions and covered bonds. These stress tests should be undertaken as part of their institution-wide stress testing as well as for market risk management and calculation purposes.

127. Institutions should apply a range of severe but plausible scenarios for all positions referred to in the previous paragraph, e.g. exceptional changes in market prices, shortages of liquidity in the markets or defaults of large market participants. Dependencies and correlations between different markets and consequentially adverse changes in correlations should, where appropriate, also be taken into account and factored in. Impact on accounting CVA and on reserves related to their portfolios (e.g. reserves for liquidity, for modelling uncertainties) should be equally taken into account in their stress tests.

128. When calibrating these stress tests, institutions should at least take into account the nature and characteristics of their portfolios and related financial instruments (e.g. vanilla / exotic products, liquidity, maturity), their trading strategies, the possibility, the cost and time that it could take to hedge out or manage risks under severe market conditions.

129. As instruments and trading strategies change over time, institutions should ensure that their stress tests evolve to accommodate those changes.

130. Institutions should develop an appropriate approach to capture underestimation of tail risk by historical data (fat tails) where applicable, e.g. by applying severe hypothetical scenarios and where risk is assessed against percentile confidence levels, should consider tail events beyond those confidence levels.

131. Institutions should in particular:

a) assess the consequences of major market disturbances and identify plausible situations which could entail extraordinarily high losses. These should, where appropriate, also include events with low probability for all main risk types, especially the various components of market risks. At portfolio level stress test, the effects of adverse changes to correlations might be explored. Mitigating effects of management actions may be taken into account if they are based on plausible assumptions about market liquidity; and

b) have in place a list of the measures containing limits and other possible actions taken to reduce risks and preserve own funds. In particular, limits on exchange rate, interest rate, equity price and commodity price risks set by institutions should, where appropriate, be taken into account against the results of the stress testing calculations.

4.7.4 Operational risk

132. Institutions should be aware that relevant risk parameters from operational risk may derive from inadequate or failed internal processes, people and systems, including legal risks, or from external events and may affect all products and activities within the institution.

133. In order to stress relevant risk parameters, institutions should use the profits or loss (P&L) effect of operational losses as the main metric. Any intrinsic impact caused by the operational risk event should be considered as operational risk loss (e.g. intrinsic impacts from opportunity costs, or internal costs such as overtime / bonuses, etc. where they relate to an operational risk event). Additionally and only for the purpose of stress testing any loss of future earnings caused by operational risk events (this excludes second line effects on the macro-economic environment) should be included. At least the institutions under the advanced measurement approach should also take these losses into account as they flow into the internal loss database to calculate the additional capital requirements. When using historical data, external data or scenarios as inputs for both P&L and RWA projections, institutions should take into account and avoid possible double counting effects.

134. As operational losses may induce second-round effects (i.e. reputational risk) and in order to account for such effects, the operational risk stress testing programme should be thoroughly integrated in the institution-wide stress test and should include interconnections with liquidity and own funds requirements. Institutions should at least analyse:

a) the exposure of the institution to activities and their associated risk culture and past record of operational losses, with a focus on the level and change in losses and gross income in the past few years;

b) the business environment, including geographical locations in which the institution operates and macro-economic conditions;

c) the evolution in headcount and in balance sheet size and complexity over the past few years, including structural changes due to corporate events as, for example, mergers and acquisitions;

d) changes to significant elements of the IT infrastructure;

e) the degree and orientation of incentivising in compensation schemes;

f) the complexity of processes and procedures, products and IT systems;

g) the extent of outsourcing, with a view of the concentration risk associated with all outsourcing arrangements;

h) the vulnerability to model risk, especially in the areas related to trading of financial instruments, risk measurement and management, and capital allocation.

135. Idiosyncratic risk factors should also be explored and used as an input for scenario design. Indicatively, institutions under the advanced measurement approach should stress their business environment and internal control factors (BEICF).

136. Institutions should consider the interactions of, and individual exposures to, such idiosyncratic risk factors in determining their operational risk exposure.

137. Institutions should analyse carefully the possible interaction of operational risk losses with credit and market risks.

138. The analysis of the stress test events should involve expert judgement, at least to include low frequency high-severity events.

139. Institutions should design severe but plausible stress events. Assumptions may differ from assumptions used in credit and market risk stress scenarios. When an institution expands its business in the local or in the international markets through mergers and acquisitions, design of new products or development of new business line, the severe but plausible stress test scenarios should be based on expert judgment to overcome the possible lack of historical information.

140. Institutions should build their stress testing programme based on both internal and external data, while analysing carefully:

a) the use of scaling factors (e.g. in a situation where external data were scaled down, the scaling may be reduced) and possible need for additional impacts stemming from changing scaling factors in stress situation ; and

b) the criteria for determining the relevance of data (e.g. large loss data considered not to be relevant may be used within the stress test, in addition to CRR requirements).

4.7.5 Conduct related risk and associated litigation costs

141. Institutions should take into account that conduct related risk, as part of the legal risk under the scope of operational risk, arises due to the current or prospective risk of losses from inappropriate supply of financial services and associated litigation costs including cases of wilful or negligent misconduct.

142. In their stress testing institutions should assess the relevance and significance of the following exposures to conduct risk and associated litigation costs:

a) miss-selling of products, in both retail and wholesale markets;

b) pushed cross-selling of products to retail customers, such as packaged bank accounts or add-on products customers do not need;

c) conflicts of interest in conducting business;

d) manipulation of benchmark interest rates, foreign exchange rates or any other financial instruments or indices to enhance the institution's profits;

e) unfair barriers to switching financial products during their lifetime and/or to switching financial service providers;

f) poorly designed distribution channels that may enable conflicts of interest with false incentives;

g) unfair automatic renewals of products or exit penalties; and

h) unfair processing of customer complaints.

143. When measuring conduct-related risk institutions should consider (i) the uncertainty around provisions or expected losses originating from conduct related events; and (ii) extreme losses associated with tail risks (unexpected losses). Institutions should assess their capital needs under such events and scenarios and should also take into account the reputational effect of conduct losses. In principle expected losses from known conduct related issues should be covered by provisions and included in the profit and loss account whereas the unexpected losses are quantified and covered by capital requirements from the institution. The possible excess of amounts after projection of stressed conduct losses should be included in the institutions' assessment of potential capital needs.

144. In order to capture the risk that the provisions are insufficient or timely inconsistent, institutions should assess expected losses from conduct risk in excess of existing accounting provisions and factor these in their projections. Where appropriate, institutions should assess whether future profits will be sufficient to cover these additional losses or costs in the scenarios and incorporate this information in their capital plans.

145. Institutions should collect and analyse quantitative and qualitative information about the extent of their business in relevant, vulnerable areas. Institutions should also provide information to support material assumptions underlying their estimates of conduct related costs.

146. In rare cases where an institution is unable to provide an estimate for an individual conduct related risk due to the extent of uncertainty, an institution should clarify that this is the case and provide evidence and assumptions supporting its assessment.

147. Stress testing should also, where appropriate, be used to assess extreme losses associated with tail risks (unexpected losses) and whether additional capital should be held under Pillar 2.

148. Institutions should form a view on the unexpected losses that may originate from conduct-related events based on a combination of: i) judgement; ii) historical loss experience (e.g. the institution's largest conduct loss over the past five years); iii) the level of expected annual loss for conduct related risk; iv) conduct-related scenarios where potential exposures over a shorter time horizon (e.g. five years) are considered; and v) losses experienced by similar entities or by entities in similar situations (e.g. in case of litigation cost).

4.7.6 Liquidity risk

149. Institutions should take into account that liquidity or funding risk arises when the institution is not able to meet current and future cash flows.

150. Institutions should take into account that liquidity or funding risks encompass:

a) short to medium term liquidity risk; and

b) funding risk.

151. Institutions should analyse and measure themselves against risk factors relating to both asset and liability side items, as well as to off-balance-sheet commitments as defined in the EBA Guidelines on supervisory review and evaluation process (SREP).

152. Institutions' analysis of risk factors should take into account, but should not be limited to:

a) the impact of macroeconomic conditions, e.g. the impact of interest rates shocks on contingent cash flows;

b) the currency of assets and liabilities including off-balance sheet items, to reflect convertibility risk and possible disruptions in the access to foreign exchange markets;

c) the location of liquidity needs and available funds, intragroup liquidity transactions and the risk of constraints for the transfer of funds between jurisdictions or group entities;

d) actions that the institution may take to preserve its reputation or franchise (e.g. the early repayment of callable liabilities);

e) the internalisation of risks related to specific activities, as in the case of, prime brokerage where symmetry, to a certain extent, might be required between the lending-side and the borrowing-side of securities, i.e. customer long positions are funded using the proceeds from customer short trades. Such symmetry is subject to counterparties' behaviour and is therefore sensitive to reputational risk. In the event of such risk, it may trigger the unwinding of trades that would unexpectedly leave the institution with securities on its balance sheet, along with the need to fund them;

f) the vulnerabilities within the funding term structure due to external, internal or contractual events;

g) realistic run-off rates during normal times that accelerate in stressed times;

h) concentration in funding; and

i) estimates of future balance-sheet growth.

153. Institutions should subject these risk factors to sensitivity analyses which in turn should provide the appropriate quantitative background for the design of scenarios.

154. Institutions should apply the following three types of stress scenarios: idiosyncratic, market-wide, and a combination of the two. The idiosyncratic stress should assume institutional specific events (e.g. rating downgrade, default of the largest funding counterparty, loss of market access, loss of currency convertibility, default of the

counterparty providing largest inflows), whereas a market-wide stress should assume an impact on a group of institutions or the financial sector at all (e.g. deterioration in funding market conditions, the macroeconomic environment or rating downgrades of countries in which the institutions is operating).

155. Institutions should design different time horizons in their stress testing: the time horizons should range from overnight up to at least 12 months; there should also be separate stress tests relating to intraday liquidity risk. The time period should display, for example, a short acute phase of stress (up to 30 days in order to cover such periods without having to change the business model) followed by a longer period of less acute but more prolonged stress (between 3 and 12 months).

156. Institutions should combine the stress of the short to medium liquidity risk with a stress of funding risk, considering a time horizon of at least 12 months.

157. Institutions should design a set of adverse behavioural assumptions for customers including depositors, other providers of funds and counterparties for each different scenario and time horizon.

158. In the design of scenarios, institutions should consider the impact of stress events for other risk types, e.g. credit risk losses, reputational risk events, to their liquidity position and the possibility of impact of firesales from other institutions (e.g. spillovers) or from their own liquidity buffer, on the mark-to-market value of other assets they hold.

159. The main methodology used for calculating the magnitude of the impact should be the net cash flow profile. For each scenario, at each stress level, the institution identifies cash inflows and outflows that are projected for each future time period and the resulting net cash flows. Institutions should consider the lowest cumulative point of net cash flows within the time period assessed in each given scenario.

160. Institutions should extend the analysis, if appropriate, to other metrics, such as:

a) liquidity ratios and other metrics used in the framework should include, but may not be limited to, supervisory liquidity ratios and metrics, in particular the liquidity coverage ratio and net stable funding ratio;

b) their available liquidity buffer, over and above the ratios referred to above, and other counterbalancing measures, i.e. their counterbalancing capacity, for each stress scenario. Stress testing of this metric should be accompanied by an assessment of the impact on the proportion and nature of encumbered assets;

c) the survival horizon of the institution as derived from its counterbalancing capacity, i.e. the institution's ability to hold, or have access to, excess liquidity over short-term, medium-term and long-term time horizons in response to stress scenarios as defined in the EBA Guidelines on common procedures and methodologies for SREP, and stressed cash flows, taken jointly, before and after the impact of counterbalancing measures;

d) solvency and profitability.

161. When applying the different stress scenarios, institutions should assess and highlight counterbalancing effects provided by central banks (monetary policy) and adopt a conservative approach.

162. Liquidity stress test metrics should include, if appropriate and in particular for at least all material currencies, a granularity per currency to allow the analysis of currency-specific assumptions in scenarios (e.g. volatility in exchange rates or currency mismatches).

163. Institutions should, where appropriate, integrate liquidity stress test in their institution-wide stress tests, and take into account different time periods covered in liquidity stress tests compared to institution-wide solvency stress tests. At a minimum, institutions should assess the impact of increasing funding costs on profit and loss. Institutions should take into account that linking funding costs to solvency position may influence the quality of the liquidity stress test, namely a too slow deterioration in liquidity.

4.7.7 Interest rate risk from non-trading activities

164. This section is without prejudice to EBA guidelines on interest rate risk arising from non-trading activities.

165. Stress tests should support and be an integral part of the interest rate risk in the banking book (IRRBB) internal management system.

166. The interest rate scenarios used for stress testing purposes, including for the purposes of application of Article 98(5) of Directive 2013/36/EU for the interest rate risk arising from the non-trading activities, should be adequate to identify all material interest rate risks, e.g. yield curve risk, spread risk and option risk.

167. Institutions should ensure that the tests referred to in the previous paragraph are not only based on a simple parallel shift but that they consider movements and changes in the shape of the yield curves in their scenario analysis.

168. Institutions should consider the following elements:

a) the spread risk , which arises from reference rates mismatching between time-matched funding and investments;

b) early termination risks included in contracts with an embedded option, which might force the institution into a new transaction on less favourable terms.

169. Institutions should be aware of potential indirect interest rate effects triggering losses elsewhere (e.g. that a pass-through onto lending rates could trigger further credit risk losses due to deteriorating customer ability to pay).

170. Where less complex financial instruments are employed, institutions should calculate the effect of a shock using sensitivity analysis (without identification of the origin of the shock, and by means of the simple application of the shock to the portfolio). Where an institution uses more complex financial instruments on which the shock has multiple and indirect effects, it should use more advanced approaches with a specific definition of the adverse (stress) situations reflecting relevant idiosyncratic risks.

4.7.8 Concentration risk

171. Stress testing should be a key tool in the identification of concentration risk, as it allows institutions to identify interdependencies between exposures, which may only become apparent in stressed conditions as well as hidden concentrations.

172. In assessing this risk in their stress testing programmes, institutions should take into account the credit risk of each exposure but also consider the additional sources of risk arising from the similar behaviour of certain exposures (i.e. higher correlation). These additional sources of risk under analysis should cover, but not be limited, to the following:

a) the single-name concentrations (i.e. client or group of connected clients as defined in Article 4 (39) of Regulation (EU) No 575/2013);

b) the sectoral concentrations;

c) the geographical concentrations;

d) the product concentrations; and

e) the collateral and guarantees concentrations.

173. In stress testing, especially institution-wide and including group, stress testing, institutions should assess concentration risk considering on- and off-balance sheet exposures, as well as banking, trading and hedging positions.

174. Stress tests should take into account changes in the business environment that may occur which would lead to the materialisation of concentration risk. In particular, stress tests should consider unusual but plausible changes in correlations between various types of risk factors as well as extreme and unusual changes in risk parameters, going beyond single risk factors, to look at scenarios that take account of interrelated risk factors and that feature not only first round but also feedback effects.

175. The way in which concentrated exposures perform in response to the same risk factors, should be factored into the stress tests, including the risk of additional short-term losses as a result of concentrated exposures across the retail and corporate credit books or across different entities in a group.

176. Institutions should consider the impact on trading book from exposures to a single risk factor or from multiple risk factors that are correlated.

177. In order to assess the ex-ante level of concentration risk and/or impact of the scenario on the concentration level, institutions should, where appropriate, consider more or less complex indicators, for instance the Herfindahl-Hirschman Index (HHI) and Gini coefficients.

178. Institutions should consider the potential existence of overlaps between different concentration sources. Institutions should not simply sum risk impacts but also put in place aggregation methods that consider the underlying drivers instead.

4.7.9 Foreign exchange lending risk

179. Institutions should take into account that foreign exchange lending risk:

a) may arise from the unhedged borrower's (i.e. retail and SME borrowers without a natural or financial hedge which are exposed to a currency mismatch between the loan currency and the hedge currency, as defined in EBA/GL/2014/13) inability to service debt denominated in currencies other than the currency of the Member State that the institution has been authorised;

b) is related to pure credit and foreign exchange market risk;

c) is characterised by non-linear relationship of credit and foreign exchange market risk components;

d) is influenced by the general exchange rate risk; and

e) may arise from conduct risk.

180. In their stress testing programmes, institutions should take into account foreign exchange lending risk affecting credit facilities in the asset side of their balance sheet and its multiple sources of risk, taking into account that debtor's inability to repay his debt may originate from:

a) risks related to his internal source of income;

b) risks related to economic situation in the country which the currency is denominated in; and,

c) foreign exchange risk.

181. Institutions should consider, when designing or implementing their stress test scenarios, that foreign exchange lending risk impact may arise from the increase in both the outstanding value of debt and the flow of payments to service such debt, as well as an increase in the outstanding value of debt compared to the value of collateral assets denominated in the domestic currency.

182. Institutions should develop stress scenarios by changing different parameters to allow them to forecast foreign exchange credit portfolio performance in different cases, such as:

a) assuming exchange rate appreciation of host currency by a predetermined percentage;

b) assuming shift in foreign exchange interest rate by a predetermined percentage points; or,

c) combining both of the above.

183. In order to assess potential vulnerability, institutions should be able to demonstrate additional credit risk losses stemming from foreign exchange lending risk separate from the credit risk losses and risk exposure amounts resulting from the impact of the scenario on credit risk factors.

184. When stress testing the foreign exchange lending risk, institutions should at least take into account:

a) the type of exchange rate regime and how this could impact on the evolution of the foreign exchange rate between domestic and foreign currencies;

b) the sensitivity impact of exchange rate movements on the borrowers' credit rating/scoring and debt servicing capacity;

c) potential concentrations of lending activity in a single foreign currency or in a limited number of highly correlated foreign currencies;

d) potential concentrations of lending activity in some specific sectors of the economy in the country currency which have a core business in foreign currency countries or markets and respective evolution of such sectors highly correlated with foreign currencies; and

e) the ability to secure financing for this type of portfolio. For institutions applying internal models for the calculation of credit risk capital requirements, the additional risk related to lending in foreign exchange currencies should be reflected in higher risk weights of such assets. The non-exhaustive list of variables used in the models should include interest rates disparities, loan LTV, currency cross correlation and volatility.

185. Institutions should take into account possible significant weaknesses that may be built-in in internal models with possible underestimation of currency depreciation on the client's ability to service his debt, taking into account the following indicative elements:

a) monetary policies during the crisis period are many times focused on stimulating real economy by significantly decreasing reference interest rates, with potential misleading information from internal models regarding these indirect effects;

b) currency appreciation may be partially offset by falling interest rates and this may cause underestimation of risk related to foreign exchange lending because in zero interest rates environment such trade – off may not be possible in the long run.

186. While assessing potential impact of foreign exchange lending on profitability in a certain scenario, institutions should, where appropriate, include the legal regime and the relevant jurisdiction, that may force institutions to denominate foreign exchange lending into domestic currency at exchange rates significantly below market ones.

4.8 Application of stress testing programmes

4.8.1 Stress testing for ICAAP/ILAAP purposes

187. As part of their internal capital and liquidity adequacy assessment processes (ICAAP and ILAAP) institutions should ensure that they have enough capital and liquidity resources to cover for the risks institutions are, or might be, exposed to, and ensure appropriate allocation of capital and liquidity resources across the entities of an institution over the economic cycle. This assessment should be reflected in the institution's capital and liquidity plans that institutions should submit to the competent authorities as part of ICAAP and ILAAP information and of the group risk assessment and liquidity profile.

188. Furthermore, by means of stress testing, institutions should evaluate the reliability of their capital plans under stress conditions to ensure that they meet the capital requirements applicable to them. Institutions should also test the reliability of their liquidity plans to ensure that they can meet liabilities as they fall due under stress conditions. Institutions should assess the level of transferability of capital and liquidity resources in stressed conditions and consider any possible impediments, including legal, organisational and operational. Institutions should, where appropriate, recognise that certain elements of capital requirements, as well as the liquidity buffers, may be used in stressed conditions (e.g. elements of the combined buffer requirements as specified in Chapter 4 of Title VII of Directive 2013/36/EU).

189. In addition to the general requirements related to institution's stress testing programmes specified in these Guidelines, stress tests used for ICAAP/ILAAP purposes should meet the following specific requirements:

a) institutions should cover all material risk categories (and sub-categories) that the institutions are exposed to with regard to both on- and off-balance sheet assets and liabilities in relation to all material portfolios or sectors /geographies, including relevant structured entities;

b) a range of scenarios should be considered including at least an adverse economic scenario that is severe but plausible, such as a severe economic downturn and/or a market-wide and idiosyncratic shock to liquidity;

c) ICAAP and ILAAP stress testing should be performed through a comprehensive institution-wide stress testing and reflect all entities on which ICAAPs or ILAAPs are required;

d) ICAAP and ILAAP stress tests should cover the same forward-looking period as the institution's ICAAP and ILAAP respectively, and be updated at least as regularly as the ICAAP and ILAAP. ICAAP stress tests should cover a period of at least two years.

190. ICAAP and ILAAP stress tests should be consistent with the risk appetite and overall (i.e. including business) strategy of the institution. Institutions should demonstrate a clear link between their risk appetite, their business strategy, and their ICAAP and ILAAP stress tests. In particular, institutions should assess their capital and liquidity plans, and any internal capital planning, including management capital buffers consistent with their stated risk appetite and

strategy, and overall internal capital needs, and rebuild their liquidity positions after using liquidity buffers to meet their liabilities during a stress period.

191. Furthermore, in their internal capital adequacy stress test institutions should assess their ability to stay above applicable regulatory and supervisory capital requirements (e.g. TSCR) in stressed conditions.

192. When doing solvency stress tests for the purposes of ICAAP, institutions should also consider the impact of scenarios on the institution's leverage ratio as well as eligible liabilities held for the purposes of minimum requirements for eligible liabilities (MREL).

193. Supervisory stress testing conducted pursuant to Article 100 of Directive 2013/36/EU or the scenarios or assumptions prescribed to an institution as a results of supervisory challenge and assessment of institutions own stress tests, should not be seen as replacing the obligations of institutions to carry out stress tests as part of their ICAAP and ILAAP.

4.8.2 Management actions

194. Institutions should identify credible management actions addressing the outputs of stress tests and aimed at ensuring their ongoing solvency through the stressed scenario.

195. Institutions should consider a broad range of management actions (including within the liquidity contingency plans) against a range of plausible stressed conditions with a focus on at least one severe but plausible scenario.

196. To assess possible responses to a stressed situation institutions should identify the credible actions that are most relevant and when they would have to take them. Institutions should take into account that some management actions are required immediately and others are contingent on specific events happening, in which case clearly defined triggers for action should be identified beforehand. Management actions should be consistent with stated strategies and policies, for example, in the context of stated dividend policies. Institutions should be conservative about their ability to take mitigating management actions recognising the possible impact of the stressed scenarios on other markets.

197. Institutions should explain the qualitative and quantitative impact of the stress before and after mitigating management actions. The impact before management actions should include assumptions about strategy, growth and associated revenue, but exclude management actions that would not be available in a stress such as winding down a business line or raising capital.

198. Acceptable management actions will be subject to the guidance and judgement of competent authorities, and might include the following:

a) the review of internal risk limits;

b) the review of the use of risk mitigation techniques;

c) the revision of policies, such as those that relate to liquidity and funding or capital adequacy;

d) the reduction of distributions to shareholders;

e) the changes in the overall strategy and business plan and risk appetite; and

f) raising of capital or funding.

199. Anticipated management actions differentiated by scenario and adjusted to the severity of scenario should be documented. Institutions should take into consideration the reduction of the efficiency as a consequence of extremely severe stressed situations. In their ICAAP and ILAALP information to be provided to the competent authorities, institutions should also explain management actions already taken based on the results of stress tests.

5. Accompanying documents

5.1 Draft cost-benefit analysis / impact assessment

Article 16 of Regulation (EU) No 1093/2010 provides the EBA with the responsibility to establish consistent, efficient and effective supervisory practices, within the European System of Financial Supervisors (ESFS), and to ensure the common, uniform and consistent application of Union law, issue guidelines and recommendations addressed to competent authorities or financial institutions.

More specifically, the EBA is mandated by Article 100(2) of Directive 2013/36/EU to foster sound and effective supervision across the EU arising from the requirements set out, while Article 107 of the same Directive stipulates that the EBA needs to assess the information provided by competent authorities for the purposes of developing consistency in the supervisory review and evaluation process. These legal provisions empower the EBA to issue guidelines which ensure that competent authorities use common methodologies when conducting its annual supervisory stress testing tasks.

The following sections of the impact assessment focus on justifying the decision for the specific provisions in the updated version of institutions' stress testing guidelines and on estimating the costs and benefits for institutions arising from the full implementation and on-going application of the guidelines. It is noteworthy that the impact assessment quantifies the net impact from the full implementation of the guidelines, implying that the costs and benefits from the actual implementation of the guidelines arising from the exercise of a national discretion will be proportionate to the level of implementation in each member state, i.e. member states which do not fully implement the guidelines will incur less costs but will also benefit less from the advantages of the full implementation.

A. Problem identification

In 2010, the CEBS, the predecessor of the EBA, issued Guidelines on Stress Testing (GL32). Since then, there have been several de facto changes in conducting stress testing which relate to its coverage, usage and related methodologies. The recent financial crisis and the several negative events in banking sector highlighted significant lessons in relation to stress testing practices and triggered changes in the conduct of stress testing. Aligning with the international practices, the EU supervisors **expect from the institutions to develop more advanced and updated stress testing practices in light of the recent experience**.

The EBA has also derived important conclusions from the 2013 EBA peer review on the implementation of the stress testing guidelines. The EBA performed the peer review to assess and compare the effectiveness of supervisory activities related to the review of credit institutions' own stress testing programmes across the EU, as well as the level of implementation of guidelines

by competent authorities[5]. Although the peer review concluded that all competent authorities' organisational and resource models have their own advantages, **the involvement of dedicated stress testing technical experts was not sufficient, irrespective of the model in question**.

The peer review also showed that the competent authorities **often focus on stress testing the largest institutions and devote far less attention to other institutions in their jurisdictions**. On the other hand, only few competent authorities **required reverse stress testing**, and when they do so, it is often a part of a recovery planning only. Additionally, there is vast diversity across jurisdictions on how competent authorities incorporate **the outcome of stress testing into the supervisory review and evaluation process (SREP)**. Finally, in many instances, competent authorities observed that stress testing continues to not be sufficiently integrated into institutions' risk management frameworks or senior management decision-making processes. **Wherever stress testing is used, scenarios continue to not be sufficiently severe to address extreme adverse economic and financial conditions.**

B. Policy objectives

These guidelines aim at achieving convergence of practices followed by the institutions and competent authorities for stress testing across the EU. They provide detailed guidance with which the institutions should comply when designing and conducting a stress testing programme, addressing at the same time the deficiencies identified by the EBA as part of the peer review. They also provide guidance with a view to ensure convergence of institution's stress testing in the context of the supervisory review and evaluation process performed by competent authorities.

To achieve this objective, the impact assessment should identify whether the relevant building blocks, required for an effective stress testing programme of the different approaches (spanning from simple sensitivity analysis on single risk factors or portfolios to complex macroeconomic scenario stress testing on an institution-wide basis), provide a reasonable trade-off between the costs and benefits involved for their full implementation and on-going application.

C. Baseline scenario

The best approach for achieving convergence of practices followed by institutions for stress testing across the EU has been discussed since the previous guidelines in 2010, in close cooperation with CAs, at several fora and during the EU-wide stress test exercises. The EBA has drafted the update of the Guidelines on Stress Testing to also ensure consistency with the EBA Guidelines on common procedures and methodologies for SREP.

Although it is expected that, even in the absence of regulatory intervention, the supervisors and institutions would anyway ensure this consistency in the future, the regulatory intervention (stress testing guidelines) would enhance the harmonisation of prudential supervision and will

[5] https://www.eba.europa.eu/-/eba-publishes-peer-review-on-the-implementation-of-the-stress-testing-guidelines

speed up the compliance of supervisors and institutions with the suggested standards, making the harmonisation feasible at an earlier stage.

D. Options considered

While drafting the stress testing guidelines, the EBA staff and competent authorities considered several options which could be included in the final provisions.

Option 1: to "do nothing" (i.e. to not draft updated guidelines)

This option implies that institutions carry out stress tests relying on the current practices without receiving any additional guidance in written. Despite the fact that most of these practices have been agreed between the CAs and the EBA, the explicit scope of different approaches for the conduct of stress testing by the institutions is missing. Furthermore, there are links between stress testing exercises and other forms of prudential supervision (SREP) that have not yet been completely established in order to ensure consistency and could improve prudential supervision. The use of these links and necessary consistence should be thoroughly explained to institutions.

The 'do noting' option would imply non-negligible operational cost for the institutions as there would be excessive communication between institutions, CAs and the EBA and possible risk of inconsistent application of stress testing methodologies and subsequently inconsistent application of the EBA Guidelines on common procedures and methodologies for SREP.

Moreover, the oral communication of the updates on best practices to the CAs, although seemingly the stress testing still relies on the CEBS guidelines (GL32, 2010), entails a level of reputational risk for institutions and supervisors alike.

Option 2: to review the CEBS guidelines on Stress Testing (GL32, 2010) and provide guidance to ensure convergence of supervisory stress testing in the context of the supervisory review and evaluation process performed by competent authorities.

The main reasons to improve the guidelines are the following: i) address the follow up from the peer review of 2013; ii) the SREP GL need supporting guidelines specifically on the part relating to stress testing; iii) the lessons learnt from the 2014 EU-wide stress test should be put in action. In particular, there is a need for a clear taxonomy on stress testing; and a need to understand the range of potential supervisory stress tests (to have an informed discussion about where to best pitch the EBA stress tests vis-à-vis other supervisory stress tests).

Although in principle the overall guidelines remain largely valid, some areas require attention, namely: data infrastructure; reverse stress testing; new individual risks (conduct risk and foreign exchange lending risk); operational risk (conduct risk an cyber risk); and the use of the outcome for capital adequacy assessment purposes (the general coverage of the SREP requires updating to reflect the new SREP guidelines). In addition, other areas can be also reviewed, namely: individual risk areas as part of the body of the GL (not annexes anymore; e.g. Liquidity Risk); institution

techniques for assessing the impact of macro-economic scenarios; transparency in stress testing and associated outcomes.

E. Cost-Benefit Analysis

The principle of proportionality applies to all aspects of stress testing, including methodology, frequency, discrimination between qualitative and quantitative assessment and the level of details of the conduct of stress testing. The cost-benefit analysis has also followed the principle of proportionality, e.g. an institution which is currently required by the supervisor to conduct a less sophisticated approach, due to its nature of products or its small size, will be allowed to follow the same approach in the future, while institutions which do not currently apply a certain part of the stress testing practices, which is recommended by the guidelines, will be assumed to follow the approach that is more appropriate for their size, business model and the nature of its financial products.

The cost-benefit analysis assessed the net monetary impact of the operational changes proposed for implementation in relation to the current operational cost relating to the conduct of stress testing. The net impact on capital requirements, implied by the implementation of the current guidelines, cannot be precisely assessed; however, it is expected to be close to zero when quantifying it as a percentage of the total operational cost of a bank.

Option 1

Benefits: the benefits for the institution are expected to be zero.

Costs: the institutions would face increased costs arising from the unnecessary oral communication seeking clarifications about the best practices on stress testing and their relation with other tools for prudential supervision (SREP guidelines). The magnitude of the costs: low

Net impact (benefits minus costs): negative (low)

Option 2

Benefits: the transparency of the current stress testing practices would enhance the confidence of institutions and make the conduct of stress testing more effective and efficient. Although these benefits are not directly observable, not precisely measurable, and are spread in time, they are not negligible and cannot be ignored. Magnitude of the benefits: low

Costs: there is no cost for the institution from the reviewing of the existing guidelines as it only clarifies what the institutions should have applied and in many cases what they already apply. These costs will further increase in the presence of miscommunications or misunderstandings. Magnitude of the costs: negligible and only related to initial requests for clarifications which the institutions may request the supervisors. This may take some time which, when converted to monetary terms, implies some negligible cost.

Net impact (benefits minus costs): positive (low)

F. Preferred option

The cost-benefit analysis in section (vi) indicates that option 1 should be excluded as it produces a negative net impact. The cost-benefit analysis, enhanced by the qualitative assessment in section (v), indicates that option 2 is proposed for implementation, i.e. reviewing the guidelines on stress testing (GL32) to ensure convergence of practices followed by institutions and competent authorities for stress testing across the EU, linking them with other tools for prudential supervision (SREP).

Following the principle of proportionality, these guidelines are applicable in their entirety to Category 1 institutions as these are the systemically important institutions. Category 2 institutions, or non-systemic medium to large size institutions, are required to follow those parts of the guidelines that are relevant for their institutions and to a level that reflects the complexity of their activities. These institutions operate domestically or have sizable cross-border activities and may operate in different business lines, which needs to be reflected in the stress testing.

For Category 3 and 4 institutions, which include small and medium institutions, the expectation is that they follow the guidelines to the extent that is proportionate and relevant to their activities, resources and the risk posed to the financial system. The scope of the stress testing for these institutions is therefore limited, reflecting the reduced scope of their activities and limited risk to the system overall.

Nonetheless, the assessment of the cost-benefit analysis above assumed that institutions of category 3 and 4 also conduct stress testing exercises according to the proportional (for their size and nature) implementation of the guidelines. In cases these institutions do not conduct stress tests and/or do not follow the guidelines the cost and net impact of Option 3 will be reduced proportionally, although this reduction is expected to be marginal and not expected to affect the magnitude of the net impact due to the simplicity of models these institutions would be assumed to apply.

Having taking into account the above assumptions, it is estimated that the total net benefit of implementing the guidelines, albeit low, could be allocated amongst the various categories of institutions as following:

Category 1: (approximation in % of the total net impact): 57% (or 4/7)

Category 2: (approximation in % of the total net impact): 29% (or 2/7)

Category 3 and 4: (approximation in % of the total net impact): 14% (or 1/7)

5.2 Feedback on the public consultation

The EBA publicly consulted on the draft proposal on guidelines on stress testing and supervisory stress testing contained in this paper.

The consultation period lasted for three month and ended on 18 March 2016. 12 responses were received, of which 11 were published on the EBA website.

This section presents the comments arising from the consultation, the analysis and discussion triggered by these comments and the actions taken to address them if deemed necessary.

Changes to the draft guidelines were incorporated as a result of the responses received during the public consultation.

Summary of responses to the consultation and the EBA's analysis

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
General comments			
Ultimate application date of the Guidelines	One respondent noted that it is important that supervisors do not underestimate the efforts that will have to be made by banks to implement and ensure compliance with these GLs. In particular, some firms may need to undergo internal reorganisations of the stress testing function and/or create internal oversight functions. These changes will require a certain period of time which must be reflected in the ultimate application date of the Guidelines. Moreover, given that institutions should endeavour to comply with Basel Committee on Banking Supervision principles for effective risk data aggregation and risk reporting (RDA) but that these principles will be in place after the Stress Testing Guidelines, a grandfathering period to comply with the application of these Guidelines would be welcome. Another respondent mentioned that the timeline of the implementation of the guidelines on stress testing and supervisory stress testing seems too ambitious. The respondent believes that the fourth quarter of 2016, the currently foreseen starting date of the guidelines application as communicated by EBA, is a too early starting date for the application of the entire guidelines and would not leave enough time for banking entities to adjust to the new guidelines. In this context, it would be advisable to	The guidelines were published in December 2015 for a three-month public consultation until 18 March 2016. They have been then finalised based on the outcomes of the consultation and 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 EBA aims to finalise the proposed guidelines during 2018, taking into account the comments received during the second public consultation. As currently foreseen, the application date will be in 2018. The previous guidelines (GL32) published in 2010 remain largely valid. The EBA understands the challenges for the further development of stress testing programmes based on best practices and that are going beyond the status quo for many institutions. The EBA recognises that institutions after the application date will continue to develop and enhance their systems and processes to meet supervisory expectations. The EBA does not see a need to split the requirements in several implementation phases. The flexibility of implementation should be maintained by taking into account proportionality principles and the respective assessment of competent authorities.	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	apply a phased approach differentiating which aspects of the guidelines would have to be implemented by the end of 2016 and which could be kept for implementation at a later stage. This is particularly important given the high number of stress test exercises and other regulatory requirements scheduled in 2016 such as the EBA stress test or the Supervisory Review and Evaluation Process (SREP) related stress test. Another respondent mentioned that a two-month implementation period is too short for such a comprehensive stress testing programme. Another respondent mentioned that the EBA draft guidelines on stress testing contain a number of suggestions that can contribute to the further development of banks' internal stress tests. At the same time, the GLs are too detailed and too prescriptive in many cases and unduly reduce the amount of discretion and freedom essential in stress testing and thus cannot be applied flexibly enough. In some areas the ideas appear to be guided too much by best practice and too little by the status quo of European banks. While supervisory proposals going beyond the status quo are, in principle, necessary and sensible for the further development of stress testing programmes in the medium term, they should not be prescribed as mandatory and relevant for SREP assessment from the fourth quarter of 2016. Further in-depth discussion with the industry on the direction this further development should take would be advisable. Institutions should be given enough time to further develop their stress testing internally through adequate implementation periods, since the new		

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	requirements go beyond the CEBS Guidelines (GL32). The respondent therefore suggests making a distinction as far as possible in all areas of the guidelines between requirements that have to be complied with, at a minimum ("at least"), from the end of 2016 and further requirements. For these further requirements, staggered, gradual implementation over a period of several years should be specified. When setting the requirements that have to be complied with, at a minimum, from the end of 2016, it should be borne in mind that a large number of parallel stress testing requirements are currently set at national and international level (e.g. EBA 2016 stress test, SREP exercise, ICAAP and ILAAP). Another respondent mentioned that it might require banks to undertake quite significant internal adjustments under both the organizational point of view and the methodological development one (especially given the focus placed on some core aspects such as correlation, concentration and second order effects as well as the treatment of model risk). Therefore, we would favour either a gradual phase-in of the Guidelines or a later date of application than the one currently envisaged.		
Proportionality	One respondent mentioned that the current draft guidelines do not seem to consistently capture proportionality principles since some abstracts in the guidelines would specifically mention proportionality considerations while others would not. To solve any uncertainty arising from this inconsistency, it would be helpful to explicitly emphasise the principle of proportionality under part 4 on the draft guidelines of the	The principle of proportionality is mentioned not only in part 2 – Executive Summary, but also in Part 3 – Background and rationale and Part 4 – Institutions' stress testing - Governance aspects of stress testing; Stress testing scope and coverage; etc. The principle of proportionality is recognised and applies to all aspects of these guidelines, including the methodology, as well as the frequency and the degree of detail of the stress tests. The	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	draft document instead of having it only mentioned in the part 1 on the executive summary. The respondent would like to stress that proportionality considerations should not only apply to small banks but also to large banks which display of very low risk profiles such as it is the case for promotional banks involved in the financing of low risk areas including social housing, municipalities, SMEs or export credits. Two respondents proposed that the GL could have specific risk area materiality thresholds for institutions that are required to apply the GL to stress testing each individual risk area. The first respondent is concerned that developing a comprehensive stress testing framework to risk areas to which a firm has immaterial exposure would be overly burdensome and provide little or no risk management information. The other respondent is concerned that by definition could mean Category 2 institutions could end up doing much the same as Category 1 institutions. Another respondent mentioned that despite the fact that pleasantly noted that the principle of proportionality has been integrated in the draft guidelines on several occasions, the respondent sometimes has the impression that there is a large scope of methods in these stress tests and the tasks are relatively prolonged and complicated, with large potential of faults. Thus, small banks might have a hard time fulfilling these requirements. The principle of proportionality could be occasionally used to an even greater extent in the guidelines. Another respondent mentioned that as guidelines under Pillar II, the entire stress testing guidelines should be	Background and rationale section and Part 4 – Institutions' stress testing contains very clear statements on proportionality and the idea is to concentrate this subject at the beginning of the GL recognising that proportionality is applicable to all aspects of these guidelines, in a similar way to other EBA GLs, instead of repeating many times the same concept throughout the paragraphs of the GL. These guidelines recognise the principle of proportionality by describing both quantitative and qualitative aspects of stress testing: small and less complex institutions may focus more on the qualitative aspects whilst larger or more complex institutions will require more sophisticated stress testing techniques. Moreover, regarding scope and coverage, stress tests should capture risks at various levels in an institution. In this regard, according to the proportionality principle, the scope of stress testing may vary from simple portfolio level sensitivity or individual risk level analyses to comprehensive institution-wide scenario stress testing. Furthermore, the proportionality principle is invoked in these guidelines to discuss the level of sophistication of the stress testing methodologies, practices and infrastructure required in relation to the size, structure and internal organisation (also taking into account the nature, scope and complexity of activities) of an institution always in connection with the SREP category where that institution belongs to.	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	applied with the principle of proportionality in mind. This is not always made clear enough in the wording of the guidelines, however. For example, some sections (2, 3 and 4) contain a proportionality proviso, others do not. In contrast, the Background and rationale section (p. 6-8) accompanying the guidelines contains a very clear statement on how proportionality could play out in smaller financial institutions. The respondent therefore suggest incorporating this section into the wording of the actual guidelines (from p. 10). Paragraph 57, too, contains an important statement on proportionality which would gain in value by being applied to the guidelines as a whole. Another respondent asked how proportionality of institutions is defined (asset size, market capitalization, etc.) and what forms the basis for proportionality principle.		
Submission of information by institutions	One respondent mentions that institutions are subject to multiple annual requirements (supervisory stress tests; ICAAP; ILAAP; recovery and resolution plans; business model analysis; and other ad-hoc stress test requirements (e.g. Brexit). The lack of an integrated supervisory approach in relation to the set of requirements creates risks of overlaps and inefficiencies in information submissions. Institutions will gain in efficiencies if recovery planning, supervisory stress testing, institution stress testing, ICAAP/ILAAP are all integrated and consolidated in one unique submission.	The EBA considers that general considerations regarding supervisory reporting and respective submission process for different purposes do not fall under the scope of the Guidelines.	No change
Impacts of the changing prudential framework	One respondent mentioned that the EBA is publishing this guidance after the commencement of the 2016 EU-Wide stress-testing exercise and during a period of uncertainty regarding the overall direction of the prudential regulatory	These GLs do not prescribe the methodologies for supervisory stress tests and, more specifically, do not set the detailed methodologies for the stress tests conducted by the EBA in cooperation with other competent authorities.	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	framework. The respondent urged the EBA to pause to reflect upon how these publications might impact the guidance. Another respondent mentioned that the requirements on stress testing for operational risk are formulated for all banks equally irrespectively of the approach applied to assess the exposure to operational risk. In view of the recent debates at the Basel Committee on Banking Supervision (BCBS) regarding operational risks and the ongoing BCBS work streams on the standardised approach for operational risk, all stress testing considerations regarding operation risks should be dealt with at a later stage once the BCBS proposals and European Union (EU) legislation would be harmonised. By doing so, additional adjustments could be avoided and a level playing field would be guaranteed.		
Operational risk and Conduct related risk and associated litigation costs	Two respondents mentioned that the requirements on stress testing for operational risk and conduct related risk are formulated separately, though conduct risk is included in the scope of operational risk as a part of legal risk. It is not clear why parts of the scope of operational risk should be considered separately for stress testing purposes and how such results should be integrated in the bank wide stress testing scenarios. The separation of the scope for the quantitative assessment would also pose a particular challenge for banks using the advanced measurement approach (AMA) for operational risk due to the fact that the relevant losses resulting from the legal risk or conduct risk events are considered within the AMA models being often developed and calibrated for the full scope of operational	Conduct risk is part of operational risk. For the purposes of calculation of the capital requirement, institutions do not calculate individual capital requirements for different sub-categories. An institution can follow this approach also for stress testing. Nevertheless if an institution follows a lesser sophisticated approach in Pillar II it might decide to or might be obligated to provide a more risk sensitive approach in Pillar II or in Stress Testing. In this case an institution can decide to calculate either a combined impact or two individual impacts. The main purpose of 4.7.5 is not to separate it from Operational Risk 4.7.4, but to stress the importance of this sub-category. With regard to the perceived redundancy between several items	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	risk losses. Therefore, further clarification on regulators' expectations regarding the structure of stress tests for operational risk would be highly appreciated. As it stands now, many requirements formulated in the consultation paper (e.g. the requirements of the items 132 and 140) represent general requirements on operational risk management process or risk inventory process. Such requirements should be included in the operational risk management guidelines or general guidelines on ICAAP and should be excluded from the Guidelines on Stress Testing (being part of the ICAAP process).	and ICAAP requirements, the EBA believes that the requirements are not a repetition. In several aspects they extent under the angle of stress testing beyond the angle applied for Pillar I or for ICAAP. If certain aspects are repeated it supports the overall presentation of expectations with in the stress test.	
Pre-provision net revenue (PPNR)	One respondent mentions that the GL provide brief coverage on Net Interest Income (NII) stress testing modelling. EBA expectations on how to stress test pre-provision net revenue (PPNR) items would be useful.	The EBA considers that in a stress test exercise capital is negatively affected as the result, among other things, of credit rating migrations, reduction of net interest margins, or trading losses. Competent authorities should have access to the details of the institution's main assumptions and risk drivers and should challenge these, also based on supervisory stress tests. The EBA considers that providing additional details on NII stress testing modelling could be useful.	Changed to provide additional details.
FX risk	One respondent mentions that FX exposures and respective risk has not been included in the GL, but to which some institutions are exposed to and who already include in their stress testing, namely: 1. Investments in subsidiaries, branches and associates, the functional currencies of which are currencies other than the currency of shareholder equity and other qualifying liabilities used to calculate the overall capital ratio. 2. Risk Weighted Assets calculated in the functional	The guidelines establish and develop additional issues that have gained importance in the stress testing programme and need to be incorporated and properly defined, such as FX lending risk with a respective new section, in addition to other individual risk areas. Guidance on direct foreign exchange risk is developed throughout several parts (market risk, conduct related risks and associated litigation costs, liquidity risk).	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	currencies of which are currencies other than the currency of shareholder equity and other qualifying to the overall capital ratio. Movement in the foreign exchange rate has an impact upon the CET1 and overall capital ratio. The respondent believes that it may be helpful to include in the GLs to alert institutions to these risks taking into account any hedging and or management actions.		
Overlap of guidelines	One respondent mentioned that in order to avoid deviating requirements from different guidelines, any potential overlap of frameworks should be ruled out. The respondent strongly recommends separating general requirements on risk management frameworks from specific stress testing guidelines. For example, stress testing guidelines for operational risk (paragraph 132), conduct risk (paragraph 140) and recovery planning (paragraph 99) include general requirements for operational risk management processes. Such requirements should be removed from the stress testing guidelines to ensure a consistent risk management framework.	The guidelines mentions that (para 132), as operational losses may induce second-round effects (i.e. reputational risk) and in order to account for such effects, the operational risk stress testing programme should be thoroughly integrated in the institution-wide stress test and should include interconnections with liquidity and own funds requirements. In addition, the guidelines mentions that (para 140) in their stress testing institutions should assess the relevance and significance of the exposures to conduct risk and associated litigation costs (providing several examples to take into account for stress tests). Moreover, the guidelines mentions that (para 99) reverse stress testing should contribute to the recovery plan scenarios by using a dynamic and quantitative scenario narrative (providing examples of types of narratives that are necessary). Therefore, the paragraphs are not general requirements but specific to stress testing, despite some possible overlaps with risk management requirements.	No change
Stress testing definition	One respondent mentions that it cannot find an overall definition of the objective of stress testing. Another respondent mentioned that the taxonomy surprisingly lacks a definition of the key term "stress test".	The stress testing is already defined throughout the CRR - Stress tests used in assessment of capital adequacy. The objective of stress testing is also defined across the GLs throughout different types of stress tests and respective	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	Such a definition should be included because various national supervisors have drafted their own definitions of "stress test". This definition should also make clear where stress scenarios stand in relation to the implicitly or explicitly used scenarios in "regular" risk measurement. This question basically concerns all types of risk, but can be illustrated particularly well by taking operational risk as an example: institutions which use the AMA must use scenario analyses as an element in calculation of their own funds requirements. Where do stress scenarios for operational risk stand in relation to AMA scenarios (when it comes to the frequency of occurrence, level of loss parameters, etc.)?	definitions (e.g. solvency stress test; liquidity stress tests; reverse stress tests;….) and generally based on the need to assess the resilience of institutions and banking systems to shocks and to challenge respective capital/liquidity positions. The GLs mentions several aspects that define clearly the objectives, among other issues, of stress testing such as: risk management tools; assessment of the resilience of institutions and banking systems; set of specified changes in risk factors, corresponding to extreme but plausible events; scenario testing and sensitivity testing; risk models and respective assumptions; etc. These GLs provide specific requirements for operational risk with a dedicated section in individual risk areas.	
Taxonomy - Top-down stress test and bottom-up stress test definitions	One respondent mentioned that in terms of stress testing technique, institutions have a repertoire of stress-testing approaches. A "bottom-up" approach requires a high degree of data granularity and model segmentation. But simple "top-down" approaches are also used e.g. to respond to senior management requests for rapid analysis of a fast-emerging event. Institutions will at times employ a combination of approaches taking into account materiality and proportionality. It would be beneficial for the GLs to acknowledge that this good practice. The respondent would prefer the generally accepted segmentation to be defined as "Institutional stress-test" and "Supervisory stress-test" to differentiate the scope.	These guidelines provide a clear taxonomy exactly due to the fact there remains substantial ambiguity and overlap in several terms and definitions. The GL's definition of "Bottom-up stress test" sets out that this is a stress test carried out by the institution. A "Top-down stress test" is carried out by the CAs or the macro-prudential authorities. These definitions have been used at the EU level since ever, for instance in the context of EU-Wide Stress Test Exercises. The same definitions apply for many CAs around the world, so current practices were taken into account. Institutions should use the GLs' definitions in communications with the CAs or the macro-prudential authorities in order to provide an harmonised language and not ambiguous instead of internal definitions developed by institutions.	No change
Taxonomy - Static	On respondent mentioned that the assumptions are not a		No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
balance sheet assumption and dynamic balance sheet assumption definitions	truly 'static in the sense that the balance sheet is constant through the projection period. The GL definition sets out the details of what is permitted to change, not permitted to change, what institutions must include and exclude results in a specific form of stress test. The 'static' stress test is simply a specific stress test with a specific set of forward-looking scenarios. Equally an institution may conduct stress tests with restrictions on projected evolution of the balance sheet and so may not be dynamic in all respects. The respondent would prefer that the term and definition ''static balance sheet assumption' is replaced with the term 'EBA assumptions', and 'dynamic balance sheet assumption' be replaced with the term 'Institutional assumptions'.	The GL refers to static balance sheet as a methodological assumption according to which the impact of the stress test scenarios is to be measured on the hypothesis of a 'constant balance sheet' and of an 'unchanged or stable business model' throughout the projection period, enhancing the comparability of the results across institutions. The GL refers to dynamic balance sheet as a methodological assumption according to which the impact of the stress test scenario is to be measured on the possibility of a 'non-constant balance sheet' and of an 'evolving business model' throughout the projection period. The EBA agrees that an institution may conduct stress tests with restrictions on projected evolution of the balance sheet and so may not be dynamic in all respects. However, this does not change the main characteristics that define both terms.	
Taxonomy - Reverse stress test	One respondent mentioned that it does not agree that (10) iii) it is the responsibility of 'the institution to decide on the kind and timing (triggering events) of management or other actions necessary both for rectifying business failures or of other problems and for aligning its risk appetite with the actual risks revealed by the reverse stress testing'. The respondent considers that management have a duty to consider its risk appetite but not necessarily align it to the results of the stress test. The respondent considers that the actions to be taken in resolution (failure) are the competent authorities' responsibility. The same respondent also mentioned that rather than state that in (10) sub-point iv) that 'specific reverse stress testing	The GL mentions that reverse stress test is an institution stress test which starts from the identification of the pre-defined outcome (e.g. points at which an institution business model becomes unviable, or at which the institution can be considered as failing or likely to fail in the meaning of Article 32 of Directive 2014/59/EU) and then explores scenarios and circumstances that might cause this to occur. Reverse stress testing has all of the following characteristics: i. it is used as a risk management tool aimed at increasing the institution's awareness of its vulnerabilities by means of the institution explicitly identifying and assessing the scenarios (or combination of scenarios) that result in a pre-defined outcome; ii. the institution estimates the likelihood of these scenarios occurring; iii. the institution decides on the kind and timing (triggering	(10) changed to clarify both the alignment with risk appetite and the use of reverse stress testing

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	can be also applied in the context of recovery planning', it would make more sense to explain that reverse stress testing should be seen as an analytical technique. It is therefore separate from recovery stress testing and resolution planning but can be used to inform a recovery plan stress test by identifying the conditions under which the recovery might need to be planned. Two respondents mentioned that items (i) to (iv) are all attributable to reverse tests. However, this is questionable, and it would be preferable if "one or more" could be used instead of "all".	events) of management or other actions necessary both for rectifying business failures or of other problems and for aligning its risk appetite with the actual risks revealed by the reverse stress testing; iv. specific reverse stress testing can be also applied in the context of recovery planning. The EBA considers that it is the responsibility of the institution to decide (not necessarily a duty) on aligning its risk appetite with the actual risks revealed by the reverse stress testing. The sentence was clarified by separating the items. The EBA considers that the definition presents a separation between reverse stress testing used in a wider context (e.g. risk assessment tool) and reverse stress testing used in specific contexts (e.g. recovery planning). The EBA considers that the definition could be clarified by mentioning that reverse stress tests applied in a wider context can be used to inform a recovery plan stress test by identifying the conditions under which the recovery might need to be planned. In addition, the items regarding characteristics can be one or more and the sentence is changed accordingly.	
Taxonomy - Second round or feedback effects	One respondent would appreciate clarification related to the guidance on the exact nature of feedback effects. The respondent currently consider macroeconomic feedback effects in the scenario design already and would welcome confirmation of the EBA intent in this area. The respondent would also like to highlight that the assessment of "spill over effects caused by the responses of individual institutions to an external shock" does not seem feasible for an isolated institution. The respondent would expect such	The GLs mentions that second round or feedback effects means the spillover effects caused by the responses of individual institutions to an external original shock, which – in aggregate – amplify such original shock, thereby causing an additional negative feedback loop. The nature of feedback effects is not limited to macroeconomic effects. The EBA considers that the definition could be clarified by mentioning that the nature of feedback effects is not limited	Para 76 and para 101 changed to clarify that it is at individual level

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	effects to be covered as part of the supervisory stress test. Two respondents mentioned that second round or feedback effects generally lead to intensification of the original shock. The respondent would assume, however, that a reduction of the original shock may also occur, and therefore suggests to adjust the wording accordingly. Another respondent mentioned the need to provide a clearer definition (and examples) of the somewhat overlapping terms "correlation", "concentration" and "second-round effects" (as mentioned in par. 101, 109, 132 and 156) and indications on how the GL expect them to be treated? In particular, wouldn't a quantitative treatment of second-round effects be too prone to model risk to be of some use? Another respondent mentioned that it would be helpful to provide an example of second round or feedback effects.	to macroeconomic effects. The EBA considers that spill over effects, at individual level, should be taken into account. The GL mentions that institutions should make qualitative assessments of second round or feedback effects of stress where appropriate and should take into account the impact of second round effects in the individual risk for stress testing. The EBA considers that the respective paragraphs for institutions could be clarified by mentioning that the assessment is at individual level, i.e. not at aggregate level, and by providing an example. The EBA does not provide information how the second round effects should be treated by individual institutions (mentioning even the use of qualitative assessments where appropriate, therefore reducing possible model risk) in order not to be too prescriptive.	
Para 18 **Annual review of institution's stress testing programme**	One respondent considers important to clarify who delivers the review and how effectiveness of stress testing is measured.	The GL mentions that institutions should regularly assess their stress testing programme to determine its effectiveness, robustness and should update it as appropriate. The assessment should be made at least on an annual basis, on the basis both of a quantitative and a qualitative analysis and should fully reflect the changing external and internal conditions. The GL also expresses that institutions should ensure that their quantitative analysis includes sound backtesting tools to validate the assumptions, parameters and results of stress testing models; institutions should ensure that their qualitative analysis has recourse to expert judgements or benchmarking assessments.	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		Therefore, the reviews and respective effectiveness and robustness are expected to be assessed throughout sound and independent backtesting tools, expert judgements or benchmarking assessments, with the same requirements used in other reviews developed by institutions.	
Para 19 **Stress testing programme – backtesting**	Two respondents mentioned that the quantitative "backtesting" of stress scenarios, in example for the occurrence of extremely rare incidents, is difficult, so the term "plausibility of assumptions" seems more appropriate in this context.	The GL expresses that institutions should ensure that their quantitative analysis in accordance with the previous paragraph includes sound backtesting tools to validate the assumptions, parameters and results of stress testing models; institutions should ensure that their qualitative analysis in accordance with the previous paragraph has recourse to expert judgements or benchmarking assessments. The EBA considers that in general quantitative analysis should include sound backtesting tools to validate the assumptions, parameters and results of stress testing models. In case of extremely rare incidents the plausibility of assumptions can be also covered by qualitative analysis (second part of the paragraph) if well justified by the institution.	No change
Para 21 **Stress testing programme – documentation**	Two respondents mentioned that while the requirements of the stress test programme documentation are considered as valid, still it would be important to give enough scope for flexibility when carrying out case-based stress tests. However, the very detailed documentation as specified under paragraph 21 may have a counterproductive effect. The two respondents mentioned that it is, therefore, recommended that institutions are given more freedom and a broader scope for case-based stress tests. One of the respondents also mentioned that it should be	The GL mentions that the institution's stress testing programme should be appropriately documented. Documentation should at least cover: a) the stress testing approach; b) the roles and responsibilities as determined in the internal policy and processes at least for the performance of the stress testing programme; c) a description of the entire process of designing, approving, performing, monitoring the performance and periodically assessing the stress testing programme and its outcomes; d) a description of the processes for evaluating stress test outcomes, including details of areas with manual or judgemental parts, also of the process for using the results for informing management actions and the strategy of the	Para 21 changed to clarify that documentation covers all types of stress tests.

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	made clear in paragraph 21, point d) that only IT applications that are used additionally and exclusively for stress testing should be included. Where a central inventory exists, reference can be made to it. Another respondent mentioned that there is also a concern that properly and thoroughly documenting all aspects of all types of stress tests within the programme might represent an enormous and partially redundant task. Some indications relating to the form the documentation of the stress test programme should take might be helpful under this respect. The respondent believes that if supervisory expectations are for a sort of single "Stress Test book", where policies, procedures and methodologies supporting all stress test types at all levels are covered, a concept similar to that of the Readers' Manual recently introduced in the EBA draft Guidelines on ICAAP/ILAAP information collected for SREP purposes might prove beneficial. One respondent mentioned that the significant granularity as well as the comprehensiveness of the GL - which cover stress tests at all levels of the organization - require both some clearer indications of what should be the scope and the depth of the stress test programme (especially for Category I banks) and some careful coordination with other supervisory requests. The same respondent asks if the programme should cover and document all types of stress tests carried out at the single risk type and/or portfolio level as well as firm-wide exercises or should it just focus on these last ones. Stress tests carried out at the first level of analysis are generally an integral part of the risk management so that measurement of the various individual	institution; and e) a description and inventory of the relevant IT applications. The stress testing programme should cover and document all types of stress tests carried out at the single risk type and/or portfolio level as well as firm-wide exercises. Case-based stress tests are difficult to define and should be considered as other stress test exercises. The EBA considers that the paragraph could be clarified. In case stress tests carried out at the first level of analysis are an integral part of the risk management and are detailed in the respective risk management frameworks, the documentation regarding stress testing programme can make clear references to such information from other sources. The same is applicable to firm-wide stress tests carried out in the ICAAP/ILAAP and in the recovery plan process. The EBA considers that all relevant IT applications should be described and not only IT applications that are used additionally and exclusively for stress testing. There are always important links that are not exclusive for stress testing that need to be mentioned or referenced through the documentation on stress testing programme.	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	risk types and their related policies, procedures and methodologies are therefore detailed in the respective risk management frameworks. Wouldn't encompassing them within the stress test programme represent just a duplication? At the other end of the spectrum, firm-wide stress test are largely overlapping with the stress tests carried out in the ICAAP/ILAAP and in the Recovery Plan process and as such they also represent a risk of consistency and duplication.		
Para 22 **Stress testing programme – business units**	One respondent noted that the consultation requires that business units not responsible for the design and application of the programme and/or non-involved external experts should play a key role in the challenging process of the stress test programme. The respondent understands that the stress test programme should be reviewed by all the internal control units, such as the internal audit unit. These areas are considered as independent from those who are responsible for the development of the stress test program. However, it would make no sense to involve those areas that do not show any technical expertise with respect to the design of stress testing in this assessment process. In that vein, Popular recommends EBA to clarify what it exactly means by units not responsible for the design and application of the programme and non-involved external experts. In addition, it should be specified that those areas that must be involved in the assessment process should be those that show significant expertise. Another respondent mentioned that the key role of the business units when challenging the stress testing programme as stated in para 22 appears unfeasible,	The GL mentions that the stress testing programme should be challenged across the organisation. Business units not responsible for the design and application of the programme and/or non-involved external experts should play a key role in the assessment of this process. The intention to involve business units not responsible for the design and application of the programme is based on the need for an independent process to challenge different subjects. The EBA understands that not only the internal audit unit but also other business units should challenge the process. A stress testing programme is transversal to the organisation. The challenge is not only about the design of stress testing but about the different subjects of a programme. It is not required to have an independent external review if the institution believes that the necessary challenge could equally be performed by business units not responsible for the design and application of the stress testing programme or by internal control or audit functions. Nevertheless, the paragraph could be clarified in order to take into account the respective expertise for specific subjects and	Para 22 changed to clarify that other business units should challenge the process throughout respective expertise for specific subjects

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	especially as it hardly seems realistic that, as first lines of defense, individual business units can scrutinise overriding issues in their entirety. This requirement should be amended. Another respondent noted that para 22 mentions the key role of non-involved external experts in the yearly assessment of the ST Programme and para 61 makes reference to the expert review of models' assumptions. The respondent asks if an independent external review of all aspects of the Programme is required or whether this could equally be performed by internal control or audit functions?	not expertise about stress testing programmes.	
Para 24 **Governance aspects of stress testing - involvement of management body**	One respondent mentioned that while the management body will stipulate scenarios and have key results reported to it, its full involvement in the design and implementation of a stress testing programme is not practicable for large and complex institutions. The involvement of the management body should be inversely proportionate to the size of an institution: the bigger the institution, the more the stress testing programme will be delegated to senior management and committees. The definition of "management body" should therefore also cover dedicated stress testing committees.	The GL mentions that institutions should ensure that their management body has the ultimate responsibility for approving the stress testing programme of the institution and monitoring its performance. The GL does not mention the need for full involvement regarding implementation. The GL mentions, among other issues, that the management body of the institutions should ensure that clear responsibilities and resources are assigned for the execution of the programme. This includes, for instance, delegation of implementation to senior management and stress testing committees	No change
Para 26 **Governance aspects of stress testing - discussion of necessary management actions with the competent**	Two respondents mentioned that according to paragraph 26, management actions should be discussed with the relevant supervisor. However, it should be clarified that in this regard the management body must only be in the position to explain such "actions", and that these do not need to be approved ex-ante by the supervisor.	The GL mentions that institutions should ensure that their management body holds an understanding of the material aspects of the stress testing programme that enables it to: (a) actively engage in discussions with stress testing committees of the institutions, where applicable, or with senior management or external consultants responsible for stress testing; (b) challenge key modelling assumptions, the scenario selection and the	No change

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authorities		assumptions underlying the stress tests in general; and (c) decide on the necessary management actions and discuss them with the competent authorities. The GL mentions that the management body of an institution should hold an understanding of the material aspects of the stress testing programme that enables it to decide on the necessary management actions and discuss them with the competent authorities, without mentioning possible ex-ante approval.	
Para 34 **Data infrastructure - adequate**	One respondent mentioned that would much prefer a revision of the section to state three things: 1) confirmation that it agrees with BCBS239 and regards it as binding on institutions and supervisors; 2) clarification of where it does not require compliance; and 3) supplementary guidance.	The GL mentions that institutions should ensure that the stress testing programme is supported by an adequate infrastructure. The EBA considers that the intention is to refer to BCBS239 as reference of best practices to which banks are expected to adhere and the requirements in this section extract high level applications to stress testing. Compliance with BCBS239 is out of the scope of this GL.	No change
Para 35 **Data infrastructure – data aggregation and risk reporting**	Two respondents mentioned that paragraph 35 makes a reference to the Basel Committee on Banking Supervision (BCBS) principles for effective risk data aggregation and risk reporting. However, the scope of application of these BCBS principles is restricted to SIBs. Other institutions do not need to take this into account which should be made clear in the text.	The GL mentions that to ensure that a proper data infrastructure has been put in place, institutions should endeavour to refer also to the extent appropriate Basel Committee on Banking Supervision principles for effective risk data aggregation and risk reporting. This also applies to other institutions with the appropriate degree of proportionality and not only to SIBs. The EBA considers that the paragraph could be clarified.	Para 35 changed to clarify that also applies to other institutions (i.e. non-SIBs)
Para 47 **Data infrastructure - Reporting practices for stress testing**	Two respondents mentioned that according to paragraph 47(b), the institutions should make sure that the results of the stress test reflect the banking risks "in an exact manner". According to the respondent, this is not possible for either risk measurement under normal market	The GL mentions that institutions should ensure that their risk reporting process: (a) is completely supported by data aggregation capabilities; (b) accurately and precisely conveys aggregated risk data and reflects risk in an exact manner; (c) covers all material risks and, in particular, that it allows the	No change

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purposes	conditions, or measurement under stress conditions, because each quantitative risk assessment is individual and subjective to a certain extent. It is therefore suggested for this passage to be removed.	identification of emerging vulnerabilities that could be potentially further assessed even in the same stress testing exercise; (d) offers or is able to offer additional information regarding main assumptions, tolerance levels, or caveats; (e) communicates information in a clear and concise manner including meaningful information tailored to the needs of the recipients. The fact that stress test data are estimations does not preclude them to be reported accurately in terms of risk aggregation.	
Para 48 **Stress testing scope and coverage - General Requirements (off-balance sheet assets)**	One respondent asked what materiality level is expected for off-balance sheet items.	The GL mentions that stress tests should take into account all the material risk types and cover both on- and off-balance sheet assets and liabilities of an institution including relevant structured entities. Institutions should ensure that risk data also fully captures off-balance sheet risks and are easily attainable at any level of the institution. Materiality, in terms of current and potential risk should be factored in, without an expected specific level.	No change
Para 50 **Stress testing scope and coverage - General Requirements (correlations)**	One respondent noted the fact that correlations tend to increase during times of economic or financial distress might happen and it might not happen. The respondent thinks it would be better to phrase the guidance as 'during times of economic or financial distress institutions should take into account that correlations may be different to those currently or historically observed". Two respondents disagreed that correlations tend to increase during times of stress and need to be analysed on	The GL mentions that stress-tests should also take into account that correlations tend to increase during times of economic or financial distress. The EBA agrees that correlations may be different to those currently or historically observed, however it prefers to emphasize that correlations tend to increase during times of economic or financial distress and not only mentioning that correlations may be different.	No change

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	a case by case basis. Another respondent mentioned (…) How does the requirement to specifically consider risk factors' correlations (and their changes, paragraph 50) in the stress test programme tie in with the indication that these would not be taken into account by supervisors when assessing the ICAAP results?	There are several indications that correlations should be taken into account.	
Para 51 **Stress testing scope and coverage - portfolio and individual risk level stress testing**	One respondent mentioned that the paragraph seems that individual portfolio basis corresponds to business unit level. The GLs do not specify the regulatory expectations with respect to individual portfolio level stress testing. The respondent would therefore welcome further clarification of this definition, as well as the specific regulatory expectations in this area.	The GL mentions that institutions should perform stress tests on an individual portfolio basis, covering all risk types that affect these portfolios, using both sensitivity and scenario analysis. Institutions should also identify risk factors and their adequate level of stress, wherever possible, at the level of an individual portfolio. The GL also provides a definition in the taxonomy mentioning that portfolio level stress test means a stress test of individual or several portfolios with the focus on the implications of the shocks from a single or multiple risk factors. Stress tests should capture risks at various levels in an institution. In this regard, according to the proportionality principle, the scope of stress testing may vary from simple portfolio level sensitivity or individual risk level analyses to comprehensive institution-wide scenario stress testing. See section on portfolio and individual risk level stress testing for more details.	No change
Para 54 **Stress testing scope**	One respondent mentioned that paragraph 54 calls for stress testing also at group level. For complex institutions, this imposes a considerable burden. The requirement	The GL mentions that in order to deliver a complete and holistic picture of the institution's risks, in addition to stress tests on the level of single entities, stress testing should be conducted also on	No change

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and coverage - Institution-wide stress testing (group-level)	should thus be confined to entities whose risks are material in a group context. This is also in line with the supervisory assessment under paragraph 221. Such entities are also covered at individual level.	a group level and across portfolios and individual risk types. The GL also mentions that it should be taken into account that (a) risks at the institution-wide level may not be well reflected by simple aggregation of stress tests on portfolios, individual risk areas or business units of the group; (b) correlations, offsetting of individual exposures and concentrations may either lead to double counting of risks or to an underestimation of the impact of stressed risk factors; and (c) specific group risks may arise at the institution-wide level. Therefore, institutions should ensure that all material risks and their respective risk factors are also to be identified at an institution wide level. When looking at risks at an institution-wide level particular attention should be paid to risk concentrations on a holistic basis. The EBA considers that the requirement is not confined to entities whose risks are material in a group context. The group stress testing programme should include and address to the extent appropriate all institutions subject to consolidation (paragraph 14).	
Para 57 **Stress testing types - General requirements**	One respondent mentioned that the general treatment of the stress test types, out of the context of the specific individual risks, doesn't signal clearly what are the supervisory expectations with respect to the use of the various stress test techniques. The respondent has the following question: specifically, is it expected that both sensitivity analysis and scenario analysis are used at all stress-testing levels and for all risk types? The respondent mentioned that if this were the case, it would seem an inappropriate requirement as certain types of analyses are	The GL mentions that the specific design, complexity and level of detail of the stress test methodologies should be appropriate to the institutions size and complexity and should take into account the strategy and business model as well as models and portfolio characteristics of the institution. The GL also mentions that institutions should conduct sensitivity analyses at the level of individual exposures, portfolios or business units, institution-wide, and for specific risk-types as proportionate to their complexity.	No change

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	better suited for certain types of risks (for example, sensitivity analysis is a common practice for market risk and IRR, but not for other risks such as credit risk).	The EBA considers that institutions should assess at which aggregation level sensitivity analyses are meaningful or even feasible. So, it is not expected that both sensitivity analysis and scenario analysis are used at all stress-testing levels and for all risk types unless is meaningful, feasible, and appropriate to the institution complexity and to the type of risks.	
Para 60 **Stress testing types – benchmarks from external sources**	One respondent mentioned that the GL should clarify to which external sources it exactly refers.	The GL mentions that the link between stressed risk factors and the risk parameters should not only be based on institutional historical experience and analysis, but should be supplemented by benchmarks from external sources and when possible from supervisory guidance. The EBA considers that it is overly prescriptive to express specific external sources. Nevertheless, the paragraph could be clarified to refer that such possibility should be used when available.	Para 60 changed to clarify that benchmarks from external sources should be used when available
Para 62 **Stress testing types – shortcomings of models**	One respondent mentioned that the GLs indicate that ‚'shortcomings of models…' ideally should be compared to alternative different modelling approaches. According to the respondent, in practice, this would require banks to develop and implement alternative models for virtually all material risk models. The respondent considers this requirement to be unnecessarily burdensome and would suggest deleting this requirement.	The GL mentions that shortcomings of models and mechanisms which link risk factors with losses or increased risk parameters should be understood, communicated clearly and taken into account when interpreting results. Where possible, results for different modelling approaches should be compared. The links should be based on robust statistical models. However, if data availability or quality or structural breaks in historical data do not allow for meaningful estimates, quantitative analyses should be supported with qualitative expert judgements. The EBA considers, and is mentioned in the GL, the results should be compared whenever possible. In addition, the GL mentions also alternatives such as qualitative expert judgments.	No change

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Para 63 **Sensitivity analysis – impact of nonlinearities**	One respondent mentioned that the GL is too prescriptive. The respondent suggested the following text: "institutions should identify the impact of nonlinearities, and threshold effects in their portfolio".	The GL mentions that institutions should assess possible non-linear interactions between risk factors and stressed risk parameters. The EBA considers that the current draft is sufficiently open on how to assess the impact.	No change
Para 64 **Sensitivity analysis – group level**	One respondent mentioned that supports the requirement to use sensitivity analysis at risk type and portfolio level, however considers it a challenge to perform a sensitivity analysis at group level taking into account that a sensitivity analysis at group level requires the use of various models and risk engines across all risk types. The respondent would therefore appreciate institutions being permitted to decide at which aggregation level sensitivity analyses are meaningful or even feasible. Another respondent mentioned that sensitivity analyses have to be performed at the level of individual exposures, portfolios and institution-wide (paragraph 64). In addition, different degrees of severity should be calculated. The required sensitivity analyses are thus multiplied if different degrees of severity have to be analysed at several levels. On top of this, there are the multi-risk factor analyses, though these are not to define stress scenarios (paragraph 68). If different degrees of severity and different levels are to be considered here, too, the number of analyses required will be increased many times over.	The GL mentions that institutions should conduct sensitivity analyses at the level of individual exposures, portfolios or business units, institution-wide, and for specific risk-types as proportionate to their complexity. The paragraph could be clarified by mentioning that institutions should assess at which aggregation level sensitivity analyses are meaningful or even feasible.	Para 64 changed to clarify sensitivity analysis at group level.
Para 66 **Sensitivity analysis – changes in**	One respondent mentioned that the GLs imply that there are thresholds – cliff effects – beyond which correlations and the risk changes in a stepped way or the slope of the changes may be broken. The respondent mentioned that it	The GLs mentions that the institutions should stress the identified risk factors using different degrees of severity as an important step in their analysis to reveal nonlinearities, threshold effects, i.e. critical values of risk factors beyond which	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
correlations	is possible that changes in correlation and risk profiles could occur for other reasons without changes in the severity of a scenario.	stress responses accelerate. The EBA considers that in the context of sensitivity analysis the usage of different degrees of severity, which is not restricted to the scenario, is essential in order to take into account the effect of nonlinearities. Other sources of nonlinearities are expected to be considered when carrying out the analysis at the different degrees of severity.	
Para 67 **Sensitivity analysis – use of statistical aspects**	One respondent mentioned that within the existing portfolio of risk on an institution there will be material risk for which it is not possible to determine a probability distribution that can be modelled. In fact it is likely that the Basel Committee will shortly give guidance on portfolios that it does not think can be modelled. The respondent acknowledged the recognition of the use of expert judgment (para 93), but the respondent recommends that the EBA review its guidance with regard to the dependency upon statistical probability distributions to assess the plausibility of scenarios.	The GL mentions that where there are uncertainties about the robustness of estimated dependency between macro-economic/macro-financial risk factors and risk parameters or a need to validate the results of more comprehensive scenario analyses, institutions should endeavour to ensure that sensitivity analyses is also carried out by stressing statistical aspects of portfolio risk parameters according to historical distributions supplemented by hypothetical assumptions (e.g. with respect to future volatilities). As acknowledged by the respondent, the GL recognises the use of expert judgment (e.g. para 93). The EBA considers that the paragraph 67 could clarify the possible use of expert judgement. The institution should provide details whenever applicable.	Para 67 changed to clarify the possible use of expert judgement
Para 71 **Scenario analysis – use of data**	One respondent mentioned that it is too prescriptive in what data should be used and to provide instead direction "to use data that is relevant and available. Relevant data may be internal and/or external and incorporate benchmarking and supervisory guidance".	The GL mentions that the design of the stress test scenarios should not only be based on historical events, but should also consider hypothetical scenarios, also based on non-historical events.	Para 71 changed to provide clarification regarding the use of data

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	The respondent mentioned that the GLs presume that each institution can identify another institution with similar risks and similar business models and that it is required an in-depth knowledge of competitors and their plans. The respondent mentions that this is an unrealistic assumption and places an expectation that maybe unachievable. The respondent encourages the EBA to review this guidance. Two respondents mentioned that according to para 71, external data should also be included in the analysis - where possible - as part of the scenario analysis. The respondent doubts, however, that it is possible to obtain external data from a bank with a "similar risk environment" and "similar business model". This usually involves strictly confidential data, so this requirement should be deleted.	Institutions should ensure that scenario designs are forward-looking and take into account systematic and institution-specific changes in the present and foreseeable future. For that purpose, institutions should endeavour to have recourse to external data from similar risk environments relevant for institutions with similar business models. The EBA considers that the paragraph could be clarified by mentioning that should be used data that is relevant and available. Relevant data may be internal and/or external and incorporate benchmarking and supervisory guidance.	
Para 72 **Scenario analysis – range of scenarios**	One respondent mentioned that sensitivity analyses have to be performed at the level of individual exposures, portfolios and institution-wide (paragraph 64). In addition, different degrees of severity should be calculated. The required sensitivity analyses are thus multiplied if different degrees of severity have to be analysed at several levels. On top of this, there are the multi-risk factor analyses, though these are not to define stress scenarios (paragraph 68). If different degrees of severity and different levels are to be considered here, too, the number of analyses required will be increased many times over. One respondent mentioned that the requirements for stress test scenarios will increase the number of analyses many times over if, again, different events and degrees of severity are to be considered (paragraph 72).	The paragraph could be clarified by mentioning that institutions should consider a range of scenarios encompassing different events and degrees of severity when meaningful or even feasible.	Para 72 changed to provide clarification regarding the range of scenarios when meaningful or even feasible.

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Para 73 **Scenario analysis - requirements**	One respondent mentioned that would prefer that if the GLs considers it necessary to clarify the scope of a plausible scenario that it replaces the word 'non-paradoxical' with the antonym of paradoxical such as 'easy', 'simple', 'clear', 'discernible', 'evident' or 'homogeneous', all of which are easier to comprehend. Two respondents mentioned that according to para 73, the scenarios should at least have characteristics as listed under a) to f). Characteristic e) in particular is far too ambitious (innovation, technological developments, sophisticated financial products), and should therefore not already come into force by the end of 2016.	The GLs mentions that institutions should ensure that their stress test scenarios meet at least the following requirements: a) (…); b) (…); c) include a coherent narrative for the scenario, covering all relevant risk factors as well as their (forward-looking) development on the basis of multiple trigger events (i.e. monetary policy, financial sector developments, commodity prices, political events and natural disasters). Institutions should ensure that the narrative scenario is plausible and non-paradoxical when assuming the co-movement of risk factors and the corresponding reaction of market participants. Where certain risk factors are excluded from the narrative scenario, institutions should ensure that this exclusion is fully justified and documented; d) (…); e) (…); f) (…). The EBA considers that the paragraph could be clarified to use the synonymous word 'non-contradictory' for 'non-paradoxical'. Regarding item e) the GL mentions that institutions should ensure that their stress test scenarios take into account innovation and more specifically technological developments or sophisticated financial products without disregarding their interaction with more traditional products. The EBA considers that it is not too ambitious that stress test scenarios take into account innovation, technological developments and sophisticated financial products. The EBA understands the challenges for the further development of stress testing programmes based on best practices and that are going beyond the status quo for many institutions. The EBA recognises that institutions after the application date will continue to develop and enhance their systems and processes to meet	Para 73 changed to provide clarification regarding one term

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		supervisory expectations. The EBA does not see a need to split the requirements in several implementation phases. The flexibility of implementation should be maintained by taking into account proportionality principles and the respective assessment of competent authorities.	
Para 77 **Severity of scenarios - concept**	One respondent mentioned that considers that inclusion of the qualification 'exceptional' to be unnecessary. Another respondent noted that the GL cover several types of stress testing with different degrees of severity (e.g. ICAAP/ILAAP stress tests; reverse stress testing; supervisory stress tests). Concepts of severity and plausibility of scenarios are included but not quantified objectively. Two respondents mentioned that the degree of severity of the stress test is defined in paragraph 10(12) Severity of scenario. However, there is no uniform system with which to determine the degree of severity. Due to the qualitative nature of the stress test, it is questionable as to whether a uniform assessment scheme can exist. The degree of severity of the stress test is therefore only measurable and comparable to a limited extent. In order to prevent the risk of unfair treatment of institutions arising, more accurate information on the degree of severity would be useful. One respondent mentioned that in paragraph 77(a), it is expected that the analysis of the stability of the financial system will be included in the scenario analysis. However, the respondent considers this rather to be a duty of the supervisor, and not of the bank. In addition, the respondent considers that it would be difficult to meet the requirements, because of insufficient or missing data. According to the respondent, this passage should therefore	The GLs mention that institutions should ensure that stress testing is based on exceptional but plausible events with an adequate degree of severity. For that purpose stress tests should be: a) meaningful in terms of providing the appropriate type of information with a view to promoting the stability of the institution and, when relevant, the financial system at all points in the economic cycle and over market fluctuations including funding markets; and b) consistently applied across the institution, recognising that identical scenarios are not necessarily severe for all business lines. The EBA considers that the inclusion of the qualification 'exceptional' is necessary to express the type of events of a scenario and respective severity; however it could be changed by the word 'extreme'. The EBA considers that the taxonomy provides definitions for both severity and plausibility (and also anchor scenarios). Several requirements are provided to assess the level of severity. The degree of deterioration of the scenario (from baseline to adverse scenario) should be expressed in terms of the underlying macroeconomic and financial variables (or any other assumptions). Greater severity of the scenario, in general, translates to larger impact of the stress test on the institution, thereby determining the actual severity of the stress test.	Para 77 changed to provide clarification regarding one term

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	be removed.	Given different purposes and types of stress testing, the level of severity is not quantified objectively but presented throughout the use and assessment of several requirements [e.g. the reference to possible anchor scenarios usually designed by a competent authority to set the severity standard for a particular stress test; use of a range of scenarios encompassing different events and degrees of severity; covering at least one severe economic downturn; aware of the dynamics of risk environments and of experiences of institutions with similar business models; in an absolute scenario the degree of severity should not depend on the current economic situation (e.g. GDP growth is set to -2%); in a relative scenario the degree of severity should depend on the current economic situation (e.g. GDP growth decreases by 2%]. The EBA considers that the analysis of the stability of the financial system should be included in the scenario analysis and it is also a duty of an institution and not only duty of a competent authority.	
Para 78 **Severity of scenarios – severe economic downturn**	One respondent mentioned that the GLs should clarify the features of the downturn scenario. In particular, it is necessary to clearly define the aspects that would differentiate the downturn scenario from the adverse ones already considered in the stress testing programme. It is worth noting that a downturn scenario with a low likelihood would be of limited usefulness to management.	The GLs mentions that institutions should ensure that various degrees of severity are considered for both sensitivity analysis and scenario stress testing covering at least one severe economic downturn for the assessment of capital adequacy and capital planning purposes. A severe economic downturn appears through many dimensions of an economic system and it is out of scope of the GLs to describe all the possible features.	No change
Para 80 **Severity of scenarios –**	Two respondents mentioned that in paragraph 80, it is only permitted to focus on the current economic situation in	The GL mentions that institutions should ensure that their scenarios assess absolute or relative changes of risk factors. In an	Para 80 changed to provide clarification

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assessment of absolute or relative changes of risk factors	relative scenarios, not in absolute ones. This differentiation is hard to understand, and should be discontinued. It is helpful to consider the current situation for both types, so as to assess the severity of the scenario. Another respondent mentioned that as scenarios are normally set taking into account current economic conditions, what does it mean that the choice of scenarios should be sufficiently severe both in relative and in absolute terms? Could an example be provided?	absolute scenario the degree of severity should not depend on the current economic situation (e.g. GDP growth is set to -2%). In a relative scenario the degree of severity should depend on the current economic situation (e.g. GDP growth decreases by 2%). In that case, the worse the current economic situation the more severe the stress of a relative scenario. Institutions should ensure that their choice of the scenario is sufficiently severe in both relative and absolute terms. Both the choice and its impact on the degree of severity should be justified and documented. The paragraph refers to absolute or relative changes of risk factors. For relative scenarios, the variations (e.g. growth decreases by 2%) are dependent on the current level and economic situation (i.e. it should be a relative change applied to the absolute level of the risk factor). For absolute scenarios, the variation should be a direct change of the absolute level of the risk factor. The EBA considers that the paragraph could be clarified.	regarding absolute or relative changes of risk factors
Para 82 **Reverse stress testing – requirements, general use, and use for recovery actions and planning**	One respondent mentioned that would be clearer to see separate sections on a) recovery plan stress-testing (near-default) ideally cross-referring to specifics contained elsewhere in other papers, and b) general guidance on reverse stress-testing as a stress testing technique. This in turn would result in definitions for the scope of recovery plan stress testing and reverse stress-testing more generally.	The GL mentions that the reverse stress testing should be used in a wider context, i.e. not only for recovery and resolution planning. The GLs for reverse stress testing are organised in three sections. The first section presents the requirements more generally. The second section presents the use of this type of institution stress tests also in a more generally way. The third section presents the reverse stress testing and respective specific use for recovery actions and recovery planning, that is in a more specific way. The definitions and scope of reverse stress testing are already	No change

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		defined in taxonomy.	
Para 83 **Reverse stress testing – use to determine the severity of ICAAP and ILAAP**	Two respondents mentioned that the use of reverse stress tests to determine the severity of ICAAP and ILAAP scenarios does not seem feasible. In the overall context, it is reasonable to use reverse scenarios as plausibility instruments. The determination of the severity, however, should be carried out based on risk appetite, as well as the coherent scenario specification, which is comprehensible for the management.	The GL mentions that institutions should include scenarios identified through the reverse stress tests to complement the range of stress tests scenarios they undertake and for comparison purposes in order to assess the overall severity, allowing the identification of severe but still plausible scenarios. The reverse stress testing should be useful to set the severity of scenarios for ICAAP and ILAAP stress tests. The severity of reverse stress testing scenarios can be also assessed by comparing it inter alia to historical or other supervisory and publically available scenarios. The GL mentions that scenarios identified through the reverse stress tests are used as complementary/additional information to comparison purposes and as useful way to assess the severity of scenarios. The EBA considers that the paragraph could be clarified to mention the useful way of assessment.	Para 83 changed to provide clarification regarding the useful way to assess severity of scenarios
Para 85 **Reverse stress testing – use**	Two respondents noted that so far reverse stress testing has largely been applied only within the context of recovery and resolution planning. One respondent is somewhat cautious about its wider deployment in practice as the potentially infinite number of degrees of freedom that are available when constructing a scenario that would lead to the point of non-viability of firm creates a significant degree of complexity to manage. This applies in particular to pan-EU and international banks that have a high degree of diversification across countries,	The principle of proportionality is recognised and applies to all aspects of these guidelines, including reverse stress testing, ensuring that it is proportional to the nature, size and complexity of their business and risks. The EBA is providing several incentives for the use of reverse stress testing in a wider context, i.e. not only for recovery and resolution planning. Institution should consider reverse stress testing not only as part of the stress testing programme but also as a regular risk management tool, carried out regularly by all	No change

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	customer types and product types. The development of multiple scenarios and the non linear causal relationships that can occur in a reverse stress testing environment can become difficult to manage and importantly, the outcomes may be difficult to interpret. Another respondent recommends developing reverse stress testing in the context of recovery plan rather than considering it as a regular risk management tool. Another respondent mentioned that reverse stress testing can be part of a bank's regular stress testing process; however it is solely used to inform management about the firms' key vulnerabilities. The respondent mentioned that reverse stress testing should not be used to inform contingency planning or affect business and capital decisions, since these processes are based on very different assumptions and perimeters. Specifically for institutions with adequate capitalisation, reverse stress tests may result in rather implausible scenarios which are of limited use for bank steering. The intention of the guideline ' to… increase the institution's awareness of its vulnerabilities…' and to '…understand the viability and sustainability of their business models and strategies…' are equally achieved by the more plausible near-default scenarios as part of the recovery planning process. The respondent would therefore appreciate more flexibility in this regard and not to overemphasize the use of reverse stress scenarios. Another respondent mentioned that the role of reverse stress testing seems overrated despite of the fact that this practice was showing limitations in the context of recovery planning. For banking entities disposing of a high level of	types of institutions and at the same level of application as ICAAP and ILAAP (e.g. institution-wide and covering all relevant risk types), sharing the same governance and quality standards and to complement other types of stress testing. The EBA considers that the GL provides sufficient degree of discretion when performing stress testing. The degree of freedom that is available when constructing a scenario for reverse stress testing should be seen as an advantage of this type of stress tests. Institutions should include scenarios identified through the reverse stress tests to complement the range of stress tests scenarios they undertake and for comparison purposes in order to assess the overall severity, allowing the identification of severe but still plausible scenarios. As part of regular risk management tool, it is important that institution identify measures that provide alerts when a scenario turns into reality. So the existence of multiple scenarios and the non linear causal relationships, despite possible difficulties to interpret, should be identified by institutions and taken into account as complementary information.	

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	capitalisation stress testing built up on "near default scenarios" could lead to distorted results and would imply a lower credibility of the actual stress testing exercise. The respondent considers that it would be important to leave enough flexibility for banking institutions in the design, planning and implementation of the stress testing. Another respondent mentioned that the the role of stress tests is strengthened significantly in the present consultation paper although stress tests displayed evident weaknesses in recovery planning. In the case of well to very well-capitalised institutions, reverse stress tests or near-default scenarios produced scenarios of little relevance in management terms. There is, moreover, the danger of non-acceptance of stress testing results. The targets communicated in the consultation paper (such as identifying current and potential vulnerabilities, identifying business model and business strategy risk or assessing the sustainability of business models) can be achieved just as well through the use of "severe but still plausible scenarios". We believe institutions should be allowed some degree of discretion when performing stress testing. Another respondent welcomed, in principle, linking reverse stress testing and recovery planning scenarios. Reverse stress testing is always performed at individual institution level under these guidelines. In the case of recovery planning, institutions which belong to an institutional protection scheme are given the option of conducting recovery planning at individual institution level or at institutional protection scheme level. It should therefore be ensured that this option for institutions belonging to an		

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	institutional protection scheme is not impaired by linking recovery planning and reverse stress testing.		
Para 86 **Reverse stress testing – use**	Two respondents mentioned that paragraph 86 states that institutions must identify measures which trigger an alarm as soon as a scenario becomes a reality. This potentially too one-dimensional approach is difficult to comprehend, especially since scenarios never unfold exactly as expected. Reference to the recovery indicators to be developed as part of the recovery plans would be more useful. Another respondent mentioned that it would appreciate further clarification on what the regulator expects on the reverse stress testing – i.e. hurdle rates, etc.	The GL mentions that as part of their business planning and risk management, institutions should use reverse stress test to understand the viability and sustainability of their business model and strategies, as well as to identifying situations where they might be in the situation considered as failing or likely to fail in the meaning of Article 32 of Directive 2014/59/EU. It is important that institution identify measures that provide alerts when a scenario turns into reality. To that end, institutions should: a) identify the pre-defined outcome to be tested (e.g. of business model becoming unviable); b) identify possible adverse circumstances which would expose them to severe vulnerabilities and cause the pre-defined outcome; c) assess depending on the institution's size as well as the nature, scale, complexity and riskiness of its business activities the likelihood that events included in the scenarios leading to the pre-defined outcome; and d) adopt effective arrangements, processes, systems or other measures to prevent or mitigate identified risks and vulnerabilities. The paragraph is general and not only to recovery planning. The EBA considers that the paragraph includes already possible recovery indicators, among other indicators. The EBA considers that the GL needs to provide sufficient degree of discretion when performing reverse stress testing, for instance regarding hurdle rates, etc.	No change
Para 90	One respondent noted that in a number of paragraphs the GLs state that stress testing should be used as a risk	The GL mentions that institutions using internal models for credit risk, counterparty credit risk, and market risk, when carrying out	Para 90 changed to provide clarification

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
Reverse stress testing – internal models	management tool for revealing the possible inadequacies of internal models. In severe stress scenarios, the respondent agrees that model risk will increase and may lead to a breakdown in the models predictability. But this should not be necessarily taken as an indication that the modelling of the inputs into the IRB formula are inadequate. The respondent suggests that the GLs could be re-drafted to reflect this. The EBA in that paragraph also references CRR Article 290 (8) in support of this requirement. The respondent encourages the EBA to review the guidance to ensure that it is aligned with the CRR. Another respondent mentioned that paragraph 90 correctly says that reverse stress tests should be seen as complementing the internal models used to calculate capital requirements. It also says that they are designed to reveal inadequacies of these internal models. We do not understand this. These models were not normally developed on the assumption of a stress situation, i.e. under fundamentally different environmental conditions. Validation of these internal models on a stress-test basis is not possible. The requirement should be deleted.	reverse stress testing in accordance with Articles 290(8) and 368(1) (g) of Regulation (EU) No 575/2013, should endeavour to identify severe, but plausible, scenarios that could result in significant adverse outcomes and potentially challenge institutions overall viability. Institutions should see these reverse stress tests as an essential complement of their internal models for calculation of capital requirements and as a regular risk management tool for revealing the possible inadequacies of these internal models. The EBA agrees that should not be necessarily taken as an indication that the modelling of the inputs into the IRB formula are inadequate. The EBA considers that the paragraph could be clarified to take into account that in severe stress scenarios, even if should not be necessarily taken as an indication that the modelling of the inputs into the IRB formula are inadequate, model risk will increase and may lead to a breakdown in the models predictability. The EBA considers that also Article 177 of the CRR – Requirements for the IRB approach – Stress tests used in the assessment of capital adequacy - could be mentioned to support the requirement.	regarding both CRR and model risk
Para 92 **Reverse stress testing - quantitative analysis**	Two respondents mentioned that the requirements for the quantitative "reverse engineering" of the specifically required stress parameters sometimes appear to be too theoretical, and do not necessarily add any additional insight. It would be however more practical and more comprehensible for the management if a certain number of	The GL mentions that institutions should perform a quantitative and more sophisticated analysis, taking into account the institution's size as well as the nature, scale, complexity and riskiness of its business activities, in setting out specific loss levels or other negative impacts on their capital, liquidity (e.g. the access to funding, in particular to increases on funding costs)	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	alternative scenarios is shown, which cover the target loss. It would thus be reasonable to refrain from the requirement for a quantitative calculation.	or overall financial position. Institutions should work backwards in a quantitative manner to identify the risk factors, and the required amplitude of changes, that could cause that loss or negative impact. The EBA considers that the GL provides sufficient degree of discretion when performing reverse stress testing. The GL mentions that institutions should, where appropriate, use sensitivity analysis as a starting point for reverse stress testing, e.g. shifting one or more relevant parameters to some extreme to reach pre-defined outcomes. However, institutions should not use sensitivity analysis to find the scenario relevant for the reverse stress test. The qualitative analysis should lead to the scenario, combining expert judgment from different business areas, as thinking might be the most effective way to avoid a business model failure. A joint stressing of all relevant risk parameters using their statistical aspects (e.g. volatility of risk factors consistent with historical observations supplemented with hypothetical but plausible assumptions) should be developed. The plausibility of the required parameter shifts to reach the pre-defined outcome gives a first idea about possible vulnerabilities in the institution. To assess the plausibility historical (multivariate) probability distributions – adjusted, where deemed necessary, according to expert judgements – should among others be applied. Qualitative analyses and assessments, combining expert judgements from different business areas, should guide the identification of relevant scenarios. The EBA is providing several incentives for the use of reverse stress testing based on quantitative and qualitative analysis.	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
Para 93 **Reverse stress testing - sensitivity analysis**	One respondent mentioned that it is unclear why a sensitivity analysis should be performed as a starting point for reverse stress testing in particular if it should not be used to find the relevant scenario.	The GL mentions that institutions should, where appropriate, use sensitivity analysis as a starting point for reverse stress testing, e.g. shifting one or more relevant parameters to some extreme to reach pre-defined outcomes. However, institutions should not use sensitivity analysis to find the scenario relevant for the reverse stress test. The qualitative analysis should lead to the scenario, combining expert judgment from different business areas, as thinking might be the most effective way to avoid a business model failure. A joint stressing of all relevant risk parameters using their statistical aspects (e.g. volatility of risk factors consistent with historical observations supplemented with hypothetical but plausible assumptions) should be developed. The plausibility of the required parameter shifts to reach the pre-defined outcome gives a first idea about possible vulnerabilities in the institution. To assess the plausibility historical (multivariate) probability distributions – adjusted, where deemed necessary, according to expert judgements – should among others be applied. Qualitative analyses and assessments, combining expert judgements from different business areas, should guide the identification of relevant scenarios. The GL mentions the use of sensitivity analysis, only where appropriate, and provides an example, namely to test relevant parameters. This provides sufficient degree of discretion when performing reverse stress testing. Finding a relevant scenario can be a different part of the process.	No change
Para 94 **Reverse stress testing**	One respondent mentioned that the GLs should provide more precision on those required scenarios that combine	The GL mentions that institutions should use reverse stress testing as a tool to gather insights into scenarios that involve	

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
- scenarios that combine solvency and liquidity stress tests	solvency and liquidity stress tests and define with more clarity those situations that can aggravate a liquidity stress event and transform it into a solvency stress event, and vice-versa, and eventually to a business failure.	combinations of solvency and liquidity stresses, where traditional modelling may fail to capture complex aspects from real situations. Where appropriate, institutions should identify and analyse situations that can aggravate a liquidity stress event and transform it into a solvency stress event, and vice-versa, and eventually to a business failure. Institutions should endeavour to apply reverse stress testing in an integrated manner for risks to capital or liquidity with a view to improve the understanding and the management of related risks in extreme situations. The EBA considers that the GL needs to provide sufficient degree of discretion when performing reverse stress testing, for instance regarding the combination between solvency and liquidity stress tests.	No change
Para 95 to 99 **Reverse stress testing - Recovery actions and recovery planning (use)**	One respondent mentioned that due to the required severity for the reverse stress test, this approach leads by definition to scenarios with low probability of occurrence, which may be less credible and less appropriate to test the recovery plan. Recovery planning should thus primarily rely on the most relevant "near default" scenarios as they ensure the proper balance between severity, consistency with the institution's strategy and business model and, finally, higher credibility. In addition, it is not clear why reverse stress testing should be required to fulfil the expectations regarding a recovery plan as outlined in paragraph 99. This can fully be achieved in the regular recovery planning framework. Two respondents mentioned that the overall classification, i.e. the relationship between ICAAP stress test (or regular scenarios) versus inverse scenarios versus recovery	The GL mentions that institutions should use reverse stress testing to assist with the development, assessment and calibration of 'near-default' scenarios used for recovery planning. Institutions should use reverse stress testing to identify the risk factors and further understand and describe the scenarios that would result in 'near default', assessing effective recovery actions that can be credibly implemented, either in advance or as the risk factors or scenarios develop. Reverse stress testing should contribute to the recovery plan scenarios by using a dynamic and quantitative scenario narrative: a) the recovery triggers, i.e. at which point the institution would enact recovery actions in the hypothetical scenario; b) the recovery actions required and their expected effectiveness, including the method of assessing that effectiveness (i.e. indicators that should be monitored to conclude that no further action is required; c) the appropriate timing and process	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	planning scenarios and their interaction during calibration seems unclear.	required for those recovery actions; d) in case of further stress, points (b) and (c) for possibly required additional recovery actions to address residual risks. The EBA is providing several incentives for the use of reverse stress testing. Institution should consider reverse stress testing also as a regular risk management tool, carried out regularly by all types of institutions. At the same time provides sufficient degree of discretion when performing reverse stress testing. For instance, as part of regular risk management tool, it is important that institution identify measures that provide alerts in the context of recovery planning and recovery indicators, when a scenario turns into reality.	
Para 96 **Reverse stress testing - Recovery actions and recovery planning – ICAAP/ILAAP**	Two respondents mentioned that according to paragraph 96, stress tests for ICAAP and ILAAP purposes, as well as the recovery planning, should not be combined, but should however be comparable. In terms of content, in paragraph 96 there appears to be a contradiction in the requirement that stress scenarios and ICAAP/ILAAP stress tests should not be interlinked, since this is asked for in other parts of the draft guidelines (i. e. paragraph 224). The respondent mentioned that the ban on interlinking should be removed. Another respondent mentioned that given that paragraph 96 implies the necessity of two sets of reverse stress test respectively for ICAAP/ILAAP purposes and for recovery planning, more detailed explanations as to how reverse stress tests should be engineered for ICAAP purposes would be welcome: what are the pre-defined outcomes that should be targeted/tested?	The GL mentions that due to the different objectives of the two sets of reversed stress tests the stress tests for ICAAP and ILAAP purposes and recovery planning should not be interlinked but compared to one another. The GLs also mentions, regarding supervisory stress testing, that competent authorities should also use the scenarios and outcomes of supervisory stress tests as additional sources of information in the assessment of institutions' recovery plans, in particular, when assessing the choice and severity of scenarios and assumptions used by the institution. In this assessment, the supervisory stress tests scenarios should, where appropriate and in particular where they satisfy the conditions set out in the EBA Guidelines on the range of scenarios to be used in recovery plans, be used as a reference point for the assessment of the institution's own scenarios and assumptions. If a competent authority identifies deficiencies in the scenarios or assumptions by the institution for the purposes of recovery planning, it	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		should, where appropriate, in addition to requiring the institution to modify their own scenarios, demand that institution uses the supervisory stress testing scenarios and assumptions. When assessing the appropriateness of such a demand, competent authorities should take all relevant factors into account paying particular attention on whether institutions have failed to incorporate system-wide events into their recovery planning. The EBA considers that there is no contradiction. The GL refers to comparisons, additional sources of information and reference points for assessments. At the same time, the GL needs to provide sufficient degree of discretion when performing reverse stress testing for both purposes.	
Para 99 d) **Recovery actions and recovery planning – residual risks**	Two respondents mentioned that the paragraph requires "additional recovery actions to address residual risks". Stress scenarios for recovery planning follow the "Near-default" criterion i.e. they are severe enough that the institution can only restore capital and liquidity by carrying out all realizable, private recovery measures available. Hence, by definition there will be no further recovery measures available. The respondent therefore suggests withdrawing paragraph 99d	The EBA considers that reverse stress testing should contribute to the recovery plan scenarios by using a dynamic and quantitative scenario narrative, taking into account the following: the recovery triggers, i.e. at which point the institution would enact recovery actions in the hypothetical scenario; the recovery actions required and their expected effectiveness, including the method of assessing that effectiveness (i.e. indicators that should be monitored to conclude that no further action is required; the appropriate timing and process required for those recovery actions; and in case of further stress, points (b) and (c) for possibly required additional recovery actions to address residual risks. In a dynamic setting, the EBA considers that residual risks may exist and may not be totally covered so further recovery measures may be available during the process.	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
Para 100 **Time series - Credit risk and operational risk**	One respondent mentioned that it seems there is the underlying assumption that lengthy time series will always be available and that all loss projection calculations, assumptions and outcomes will be comparable with these historical observations. The respondent cautions that this may not always be the case and it is important to note that when data is available it may well not cover more than 10 years of history. The respondent is therefore of the opinion that the GL should provide more room for expert based parameter setting. This could for example be done by defining guidelines for setting these expert based parameters.	The EBA considers that institutions should ensure the stress testing of individual risk is proportional to the nature, size and complexity of their business and risks. In addition, institutions should consider, wherever possible, the use of quantitative analysis. For instance, relevant parameters such as probability of default (PD), Loss Given Default (LGD) and Exposure at Default (EAD), expected loss (EL) and risk exposure amount and the impact on credit losses and own funds requirements should be taken into account wherever possible. Moreover, for the estimation of future losses institutions should, where appropriate, rely on credit risk parameters different from the ones applied in the calculation of capital requirements, which are usually through-the-cycle for PD and under downturn conditions for LGD. In particular, institutions should, where relevant, apply estimates based on point in time parameters in accordance with the severity of the scenario for the purpose of estimating credit losses. Therefore, the underlying assumption that lengthy time series will always be available is not assumed as part of the GLs and quantitative analysis and empirical evidences are considered only wherever possible and historical relations and data should be challenged as well (and based on the principle of proportionality) as mentioned throughout several paragraphs. For instance, regarding operational risk the use of expert judgment to overcome a possible lack of historical information is mentioned (para 137). When an institution expands its business in the local or in the international markets through mergers and acquisitions, design of new products or development of new	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		business line, the severe but plausible stress test scenarios should be based on expert judgment to overcome the possible lack of historical information. For instance, for credit risk, institutions should apply, to the extent appropriate, credit risk internal model approaches that challenge historical relations and data, and simulations of credit quality migrations among categories of exposures to provide an estimate of losses (para 115).	
Para 103 **Credit and counterparty risk –** **central clearing houses exposures**	One respondent mentioned that the risk from central clearing houses is not included. The respondent believes that it is appropriate for exposure to these exchanges to be highlighted on the basis that they pose a systemic risk that an institution may find it very difficult to mitigate in severe stress given the need for mandatory clearing through these exchanges.	The EBA considers that the paragraph could be clarified to mention also central clearing houses exposures.	Para 103 changed to provide clarification regarding central clearing houses exposures
Para 105 **Credit and counterparty risk - sensitivity analysis**	One respondent mentioned that credit risk stress testing should encompass everything from simple sensitivity analyses to stress scenarios (paragraph 105). It should be performed both at different levels – market-wide, counterparty-specific, sector-specific – or a combination of these and with different time horizons (paragraph 107). In the process, the numerous sensitivity analyses required under paragraph 64 ff. of the draft guidelines, must be considered.	The GL mentions that institutions should ensure that credit risk is assessed at various levels of shock scenarios from simple sensitivity analyses to institution-wide stress tests, or to group wide stress testing, in particular: a) market wide shock scenarios (e.g. sharp slowdown of the economy which affects portfolio quality for all of the creditors); b) counterparty specific and idiosyncratic shock scenarios (e.g. bankruptcy of biggest bank creditor); c) sector specific and region specific shock scenarios; d) combination of the above. Institutions should subject risk factors to sensitivity analyses, which in turn should provide quantitative background for the design of scenarios. Institutions should apply different time horizons when applying	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		their stress scenarios. The time horizon should range from overnight (one-off effect) up to longer terms (e.g., creeping economic downturn). The EBA considers that sensitivity analysis is taken into account and expressed.	
Para 112 **Credit and counterparty risk - TTC PD and downturn LGD**	Two respondents mentioned that the requirement recommends for the estimation of future losses to apply through-the-cycle (TTC) parameters for risk-weighted assets (RWA) calculation. The respondent would welcome clarification in the final Guidelines whether the regulatory view is to establish two PD parameters sets within banks used for stress testing in line with the EBA/ECB stress testing methodology: point-in-time (PIT) parameters for profit and loss (P&L)/accounting and TTC parameters for capital requirements. Two respondents mentioned that in para 112, it is assumed that PDs used for the calculation of capital requirements are "usually" TTC PDs. This is not the case, as in many ratings systems there are also mixed systems of PIT and TTCs. The insertion regarding PDs is misleading, and should be removed.	The GL refers clearly that institutions should, where relevant, apply estimates based on point in time parameters as follows: For the estimation of future losses in stress tests, institutions should, where appropriate, rely on credit risk parameters different from the ones applied in the calculation of capital requirements, which are usually through-the-cycle for PD and under downturn conditions for LGD. In particular, institutions should, where relevant, apply estimates based on point in time parameters in accordance with the severity of the scenario for the purpose of estimating credit losses. The methodology of the Supervisory EBA EU-wide stress test is independent from this GL.	No change
Para 113 **Credit and counterparty risk - legal capacity to unilaterally cancel undrawn amounts of committed credit**	One respondent recommended the exclusion in the GLs of the comment on the unilateral cancellation of undrawn amounts of committed credit facilities, given that this might have a significant reputational risk effect. The respondent view is that any unilateral actions from an institution in stressed conditions should be considered through the institution's recovery planning efforts.	The GL mentions that for the computation of Exposure at Default, institutions should also consider Credit Conversion Factor (CCF) and, in particular, the effect of the institution's legal capacity to unilaterally cancel undrawn amounts of committed credit facilities especially in stressed conditions. The GL does not recommend the use of unilateral actions, but on	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
facilities		the contrary, recommends that institutions consider the potential negative effects of this possible legal capacity.	
Para 114 **Credit and counterparty risk - use of models**	One respondent mentioned that the GL could make it clearer that paragraph 114 refers to the use of models under conditions for extreme stress.	The GL mentions that institutions should apply, to the extent appropriate, credit risk internal model approaches that challenge historical relations and data, and simulations of credit quality migrations among categories of exposures to provide an estimate of losses. The EBA considers that the paragraph does not refer only to the use of models under conditions for extreme stress.	No change
Para 117, 119, and 120 **Securitisation**	One respondent mentioned that the requirements in paragraphs 117, 119, and 120 are overly prescriptive. The stress testing of factors such as collateral values and credit enhancements does not necessarily generate price shocks similar to historically observed movements. The respondent therefore proposes that the requirements are amended to allow banks flexibility on the factors that are considered in stress testing of securitisation risk.	The EBA considers that the stress testing of securitised assets and the reference to the evolution of collateral values is not overly prescriptive. Institutions should ensure that stress testing of securitised assets addresses the credit risk of the underlying pool of assets, including the default risk, the possibly non-linear and dynamic default correlations as well as the evolution of the collateral values. Institutions should take into account all relevant information with regard to the specific structure of each securitisation, such as the seniority of the tranche, the thickness of the tranche, credit enhancements and the granularity, expressed in terms of effective number of exposures. Addressing the credit risk, the evolution of the collateral values, and taking into account all relevant information with regard to credit enhancements does not necessarily mean to stress testing	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		such factors and provides already enough flexibility to institutions.	
Para 118 **Securitisation - liquidity dry-out**	Two respondents noted that liquidity dry-out is not likely to be a factor when securitisation facilities are funded on balance, reducing any reputational risk issues. Most stress test models use macro-economic indicators (e.g. GDP, unemployment) to project stress default rates, which are in turn used to project a stressed probability of default (PD). Potential liquidity issues (as seen through market spread volatility) are taken into account as there is often a correlation between macro-economic indicators (e.g. GDP) and market spread levels. One of the respondents above also mentioned that in the trading book, liquidity risks are captured through market risk management stress tests. Test scenarios are based on periods of stressed market conditions and applied to the current securitisation portfolio. Lastly, liquidity horizons are included in the analysis.	The GL mentions that the sensitivity to systemic market effects, impacting e.g. in liquidity dry-outs or increasing asset correlations, on all levels of the structured product should be carefully taken into account. Also the effect of reputational risks, resulting e.g. in funding issues should be assessed. The liquidity dry-outs are mentioned only as a possible example.	No change
Para 122 **Securitisation - different capital regimes**	One respondent proposed the EBA review the requirements in paragraph 122 to consider the different capital regimes applicable to institutions. The capital held by firms against securitisation assets under the standardised capital regime is conservative even under severe stress scenarios such as instantaneous shocks based on 2008 and 2011 market conditions.	The GL mentions that when designing the stress testing approach, institutions should consider the following: (a) the impacts of stress tests for structured credit products will materialise on the level of the asset pool in increased PDs and LGDs and hence increased expected loss/impairment rates and regulatory capital (as well as increased probabilities for downgrades) should be expected during shocks; and (b) that further impact may arise from decreases in the net-cash flow, increases in trading losses and value adjustments or from the deterioration of regulatory metrics such as e.g. the net-stable	Para 122 changed to clarify that considers different capital regimes applicable to institutions.

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		funding ratio. The paragraph can be changed to clarify that considers different capital regimes applicable to institutions.	
Para 123 and 124 **Market risk - IRRBB**	Two respondents suggested a clarification in the GLs that market risk is defined as being limited to the trading book. In respondents view, interest rate risk in the banking book should be excluded from the definition of market risk for the purposes of the proposed GLs and therefore exclusively covered in section 4.6.7. In addition, the applicability of the Guidelines in respect to paragraph 124 is not clear. It would be helpful for the GLs to clarify whether these should be captured within market risk. In our view, it is not clear whether interest rate risk on AFS positions in the banking book would be covered by section 4.6.3 or not. The two respondents would welcome clarification of these articles about the exact scope of application.	The GL mentions that institutions should take into account market risk, notably risks derived from losses resulting from adverse changes in the value of positions arising from movements in market prices across commodity, credit, equity, foreign exchange and interest rates risk factors. Interest rate risk in trading book positions should be considered by institutions as a component of market risk. Interest rate risk in the banking book is also considered as a component of market risk. The GL also mentions that institutions should conduct stress tests for their positions in financial instruments in the trading and available-for-sale portfolios (i.e. respective accounting terms to classify financial assets), including securitisation instruments/positions and covered bonds. These stress tests should be undertaken as part of their institution-wide stress testing as well as for market risk management and calculation purposes.	No change
Para 128 **Market risk - fat tails risk**	Two respondents mentioned that paragraph 128 demands that "fat tail risk issues" in particular should be taken into account, as part of the stress test. While this is reasonable in general, it should be added that institutions are only obliged to do this if non-stressed VaR and IRC (if determined) are in a position to take fat tails into account in an appropriate manner.	The GL mentions that institutions should take into account that the main weaknesses of the Value at Risk (VaR) models relates to the non-capturing or the underestimation of tail risk by historical data (fat tails). To capture fat tails, institutions should apply severe hypothetical scenarios. Where risk is assessed against possible time horizons and percentile confidence levels, institutions should consider tail events beyond that confidence levels.	Para 128 changed to clarify the previous text.

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		The EBA considers that the paragraph could be clarified by mentioning that institutions should develop and appropriate approach to capture fat tails, e.g. by applying severe hypothetical scenarios and, where risk is assessed against percentile confidence levels, should consider tail events beyond those confidence levels.	
Para 130 **Operational risk – sensitivity analysis and risk**	One respondent mentioned that in some institutions, Operational Risk Stress Testing (ORST) methodology leverages operational risk capital scenarios internal models which are used for ICAAP / Pillar 2 capital. The effect of possible changes on the Standardised Measurement Approach (Basel Committee consultation in 2016) – if implemented – is that internal models of operational risk will no longer be permitted for Pillar 1 calculation of the minimum capital requirement. The consequence may be a more prescriptive and less risk sensitive approach to stress testing of operational risk. The respondent welcome receiving EBA confirmation that the "risk sensitiveness" of an institutions' stress testing from an Operational risk perspective may continue to remain unchanged. Other respondent recommended extending the consultation period to ensure proper consideration of the latest developments in the area of operational risk.	The GLs defines sensitivity analysis as a stress test that measures the potential impact of a specific single risk factor or simple multi-risk factors, affecting capital or liquidity, to a particular portfolio or to the institution as a whole. Operational risk is included and estimations should include risk sensitivity for stress testing purposes wherever appropriate. The GL on stress testing is in place for all institutions; therefore also institutions that do not apply a very risk sensitive approach, i.e. non-AMA institutions, are required to design a risk-sensitive stress-test. If in the future the AMA might not be in place anymore, i.e. all institutions apply an approach that has a limited level of risk-sensitivity; the stress-test requirement will still remain in place for all institutions. The current GL might require further adoption after a new Basel regime is transformed in EU law and endorsed, but a delay of the work on this GL should not be considered a viable solution.	No change
Para 131 **Operational risk – use of historical data**	One respondent noted that the use of historical data or external data as inputs might be misleading and create double counting if they are used for both P&L and RWA projections.	The GL expresses that In order to stress relevant risk parameters, institutions should use the profits or loss (P&L) effect of operational losses as the main metric and distinguish between economic loss and loss of future earnings.	Para 131 changed, adding the alert to possible double counting effect.

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		Moreover, the GL also expresses that the analysis of the stress test events should involve expert judgement, at least to include low frequency high-severity events. When an institution expands its business in the local or in the international markets through mergers and acquisitions, design of new products or development of new business line, the severe but plausible stress test scenarios should be based on expert judgment to overcome the possible lack of historical information. Therefore, the use of historical data and external data as inputs are only considered as part of possible information to be used. Nevertheless, given a possible misuse of data and double counting effect if used for both P&L and RWA projections, the GL could mention this aspect accordingly.	
Para 131 **Operational risk - P&L impact**	Two respondents mentioned that in order for operational risk events to have a P&L impact, they need to have an effect on the General Ledger. Neither near misses (loss amount =0) nor loss of future earnings (which are difficult to trace back to particular operational risk events) would qualify as causing any impact in the General Ledger and thus would be difficult to quantify. They therefore cannot be qualified as being an operational risk loss with a P&L impact. One respondent mentioned that the term economic loss is not nearly defined in the context of operational risk loss even for AMA banks. From the respondent point of view, "near misses" and "losses of future revenues" are not mandatory elements of operational risk loss data collection. Such elements of operational risk losses may be collected for operational risk management purposes by AMA banks	The GL mentions that in order to stress relevant risk parameters, institutions should use the profits or loss (P&L) effect of operational losses as the main metric. But this should not limit the effect to the P&L effect; the economic loss of an asset might be higher than its book value. The paragraph could be clarified regarding near misses and loss of future earnings. The draft on the RTS on AMA consulted in 2014 published in 2015 explains that near misses are to be collected as well as e.g. operational gains. This is in line with the current expectations of European supervisors. Since they are collected it should not be an additional burden. The institutions should use the flagged positions as additional data points for the stress test calculation. The only additional	Para 131 changed to provide clarification regarding near misses and loss of future earnings

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	and are not included in the scope of operational risk loss for the calculation of capital requirements for operational risk (except for material uncollected revenues, as referred to in Article 28, point (e) of the Final Draft Regulatory Technical Standards on the specification of the assessment methodology). A new regulatory requirement to consider such elements for stress testing purposes would require significant efforts from banks to extend their loss data collection and to adjust or at least to re-calibrate AMA models in order to accommodate new elements.	burden would be a second set of calculations, but since the data collection is more labor intensive element, the additional calculation should only limited additional burden for the IT capacities.	
Para 132 **Operational risk – second-round effects**	One respondent mentioned that the relationship between the business activities, the losses incurred by operational risks and gross income that is to be analysed represents a new requirement. The respondent assumes that an implementation of this requirement could have a major impact on IT systems. One respondent mentioned that it should be pointed out that the presumed linkage between the development of employee numbers, the balance sheet total and the operational risks is not considered appropriate. Further explanations of the required analysis of the so-called "complexity", the required analysis of "changes to significant elements of the IT infrastructure", the required analysis of the "complexity of processes and procedures, products and the IT system", and the required analysis of "the susceptibility to model risks" would be very helpful. One respondent asked if the provisions of paragraph 132 mean that the P&L effect of the factors listed in points a) –	The GL mentions that as operational losses may induce second-round effects (i.e. reputational risk) and in order to account for such effects, the operational risk stress testing programme should be thoroughly integrated in the institution-wide stress test and should include interconnections with liquidity and own funds requirements. Institutions should at least analyse: a) the exposure of the institution to activities and their associated risk culture and past record of operational losses, with a focus on the level and change in losses and gross income in the past few years; b) the business environment, including geographical locations in which the institution operates and macro-economic conditions; c) the evolution in headcount and in balance sheet size and complexity over the past few years, including structural changes due to corporate events as, for example, mergers and acquisitions; d) changes to significant elements of the IT infrastructure; e) the degree and orientation of incentivising in compensation schemes; f) the complexity of processes and procedures, products and IT systems; g) the extent of outsourcing, with a view of the concentration risk associated with all outsourcing arrangements; h) the vulnerability to model risk, especially in the areas	Para 132 changed to provide clarification

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	h) should be assessed. Is a quantitative assessment with respect to internal capital expected from AMA banks? Considering the number and scope of risk factors to be at least considered under the operational risk stress testing programme, the respondent requested clarification of whether any quantitative stress test assessment for purely macroeconomic scenarios (e.g. downturn scenarios for market and credit risk) should be also considered mandatory for operational risk stress testing.	related to trading of financial instruments, risk measurement and management, and capital allocation. The previous guidelines (GL32) published in 2010 remain largely valid. The EBA understands the challenges for the further development of stress testing programmes based on best practices and that are going beyond the status quo for many institutions. The GL mentions that institutions should at least analyse the factors listed in items a) to h), so the factors need to be assessed. The stress test would not have to come up with specific effects of each of the factors, but at least these factors should be considered, when determining the potential effect of a stress situation. The institution should try to assess it vulnerabilities and loss potentials, wherever required it should take a forward looking approach and it should try to assess foreseeable changes to the potentials. Institution do not have to quantify each item, but if a relevant risk is encountered a more detailed quantification should be done. For instance: i) the change to significant elements of the IT infrastructure are usually potential risks during the phase of change while its benefits are only relevant in the long run, Not all changes represent a significant effect on the exposure, but if the IT is moved from one location to a different location (e.g. country) or the fundamental programs or platforms are changed this might present a risk in the short term; ii) besides the size of an institution the complexity is a significant driver of risk. An institution that operated in multiple jurisdiction or trades not only in standardized products but also in self-	

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		design specialized product should assume a higher-risk profile. Changes to these points might be considered as additional risk potentials; iii) changes to the model usually create a model risk in the short run. Since changes to the model are predictable an institution should be aware of a phase of increased risk. Institutions that apply internal models for pricing or capital requirement calculation might suffer from losses due to errors in the design or application of the model. Especially if an institution uses an increased number of models or uses it for an increased share of its business, the institution might suffer losses, in case the model is not adequately equipped for the stress situation. The EBA recognises that institutions after the application date will continue to develop and enhance their systems and processes to meet supervisory expectations. The flexibility of implementation should be maintained by taking into account proportionality principles and the respective assessment of competent authorities. The EBA considers that the possible linkage between the development of employee numbers, the balance sheet total and the operational risks is appropriate. Analysis from supervisory as well as industry side has shown a strong link between the size of an institution and its operational risk (especially with regard to the loss frequency). An increase in business size is therefore considered a good indicator for future risk potentials. Institution should be aware that business size might be calculated in different ways balance sheet, P&L, number of employees etc. double counting should be avoided (e.g. a theoretically a bank increases its business volume by 50% from one year to another, without change to it business or other parameters, it should not double or triple count the increase in balance sheet, P&L and	

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		employees). But banks should also consider that rapid changes in business size in either direction might create operational risk in the short run. Any comparison of this kind should only be done within a well-defined peer group or within a timeline of one institution.	
Para 133 and 134 **Operational risk - idiosyncratic risk factors and business environmental and internal control factors**	Two respondents mentioned that there is uncertainty as how to stress test "business environmental and internal control factors" (BEICFs) if indicators are used in a purely qualitative manner or show only a potential change in risks. Clarification would also be helpful to understand what is meant by "such risk factors" in the requirement in paragraph 134 to "consider the interactions of and individual exposures to such risk factors". Does it mean the idiosyncratic risk factors referred to in paragraph 133 or other factors?	The GL mentions that idiosyncratic risk factors should also be explored and used as an input for scenario design. Indicatively, institutions under the advanced measurement approach should stress their business environment and internal control factors (BEICF). The stressing of BEICF depends on the way BEICF are designed. Even when BEICFs are only used as indicators the institution can stress them. E.g. that a high number or all BEICF indicate problems (e.g. as a traffic-light) and a high number or all of scenarios need to be adapted. The GLs mentions that institutions should consider the interactions of, and individual exposures to, such risk factors in determining their operational risk exposure. The factors mentioned at the beginning of paragraph 134 refer to idiosyncratic risk factors in the previous paragraph. The business environment and internal control factors at the end of the paragraph refer to Art. 322 (2) (b) CRR.	Para 134 changed to clarify that refer tp idiosyncratic risk factor.
Para 135 **Operational risk - interaction of operational risk losses with credit and**	One respondent mentioned that regarding the analysis of a possible interrelation between losses from operational risks, credit risks, and market risks, there is uncertainty as to whether a quantitative analysis of correlations or a qualitative analysis of causalities should be carried out. An explanation would be helpful here.	The GL mentions that institutions should analyse carefully the possible interaction of operational risk losses with credit and market risks. The EBA considers that the GL needs to provide sufficient degree of discretion when institutions analyse the interaction of	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
market risks		operational risk losses with credit and market risks. While institutions should be aware that boundary losses (CR-OpR) should not be considered in a stress test directly, second round effects though interrelations and causalities have to be considered. When detected and when significant interrelations between risk categories have to have an impact of the quantitative outcome of the stress-test. Interaction and effect transmission between different risk categories might vary widely in accordance to the business model and the structure of the institution. The EBA does therefore not provide additional explanation and allow a higher level of discretion in this area.	
Para 136 **Operational risk –** **low frequency high-severity events**	One respondent mentioned that the scenario analysis is a mandatory element of an AMA model. Can the requirement in paragraph 136 be seen as fulfilled by banks applying the AMA for the calculation of their own funds requirements if stress testing is performed using the same model?	The GL mentions that the analysis of the stress test events should involve expert judgement, at least to include low frequency high-severity events. The AMA model provides a curve of quantiles under normal conditions. Depending on the parameters of the model a very high quantile of the normal curve cannot also be considered as a point on a stress curve. So even while the same tool might be used, it has to be judged individually, if the AMA in its normal setting is providing adequate results. When the AMA model can be applied to provide results from the scenario analysis, the institution should verify that the results from the scenario analysis are in line with the stress test scenarios. Details might need to be adapted.	No change
Para 137 **Operational risk -**	Two respondents mentioned that paragraph 137 refers to risk type-specific stress tests. An explanation of how these	The GL mentions that institutions should design severe but plausible stress events. Assumptions may differ from	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
assumptions	are embedded in the overall context of stress testing would therefore be useful. If different assumptions from those in market and credit stress scenarios are used for operational risk stress testing, will the results still have to be integrated into bank-wide macroeconomic stress scenarios?	assumptions used in credit and market risk stress scenarios. When an institution expands its business in the local or in the international markets through mergers and acquisitions, design of new products or development of new business line, the severe but plausible stress test scenarios should be based on expert judgment to overcome the possible lack of historical information. The GL mentions that assumptions may differ, but does not mention that they always differ. In the overall context of stress testing in which results have to be integrated into bank-wide macroeconomic stress scenarios, the assumptions are not expected to differ from assumptions used in credit and market risk stress scenarios.	
Para 138 **Operational risk – AMA**	Two respondents noted that according to Capital Requirements Regulation (CRR) Article 322 (4), institutions using the AMA shall determine and use relevant external data. Concerning section a) the respondent assumes that the guideline does not require additional impacts stemming from changing scaling factors in stress situation to be considered. However, the respondent would welcome clarification in order to prevent misleading assumptions. The formulation of section b) gives the impression that firms should also use external data which, even in stress situations, are not relevant for the bank's business model. This requirement would thus be misleading in the context of CRR. The respondent suggests therefore the removal of the following text "e.g. large loss data considered not to be relevant may be used within the stress test". Another respondent mentioned the need for level playing field and awareness of the different requirements for AMA	The GLs mentions that institutions should build their stress testing programme based on both internal and external data, while analysing carefully: a) the use of scaling factors (e.g. in a situation where external data were scaled down, the scaling may be reduced); and b) the criteria for determining the relevance of data (e.g. large loss data considered not to be relevant may be used within the stress test). The paragraph could be changed to clarify the possible need for additional impacts stemming from changing scaling factors in stress situation and the use of large loss data within the stress test in addition to CRR requirements. Whenever the AMA is already requiring the inclusion of internal data, external data, scenarios or BEICFs the institution might have to adapt this for the stress testing. The institution might want to design the stress-test in a way that the stress test	Para 138 changed to provide clarification regarding scaling factors and use of data

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	and non-AMA institutions within the stress testing guidelines. As part of the AMA model (article 322 of the CRR), institutions already comply with several articles (cf. articles 136, 137. 140, 143, 146) in calculation of their own funds requirements through the integration of operational risk scenarios. In order to avoid double counting, the respondent suggested that these risk scenarios fulfil the function of the required stress events and analysis of exposures. The respondent also mentioned the increased burden. The requirements for loss data collection in stress testing go beyond the currently existing requirements for operational risk. Compliance with these would impose a considerable implementation burden.	provides the delta to the already included elements or the original data is excluded when the modified data is included. Double counting of the same information should be avoided. On its own the AMA scenario should not be considered as stress scenario (similar the Market Risk, where a VaR and a higher Stress-VaR are calculated). The stress test requirements are an additional burden to the institution since it examines a different angle. While the most burdensome element of a risk-sensitive OpRisk analysis (the data collection) can be used for AMA and Stress Test, specific modifications are necessary. Scenarios and BEICF might be modified as well a collection of "loss of future profits" is established by the stress testing. The EBA recognises that institutions after the application date will continue to develop and enhance their systems and processes to meet supervisory expectations. The flexibility of implementation should be maintained by taking into account proportionality principles and the respective assessment of competent authorities.	
Para 139 **Conduct related risk and associated litigation costs - scope**	One respondent mentioned that according to Article 252 of the SREP Guidelines, conduct risk (section 4.6.5) is included in the scope of operational risk (section 4.6.4), and therefore, suitable standards are necessary;	The GL mentions that institutions should take into account that conduct related risk, as part of the legal risk under the scope of operational risk, arises due to the current or prospective risk of losses from inappropriate supply of financial services and associated litigation costs including cases of wilful or negligent misconduct. The use of a separated section is only to highlight the importance of conduct risk in the context of stress testing programmes (see executive summary of the GL). It is mentioned in the paragraph	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		that conduct related risk is part of the legal risk under the scope of operational risk.	
Para 140 **Conduct related risk and associated litigation costs**	One respondent mentioned that it is unclear whether an approximate evaluation of loss data is sufficient for assessing the relevance and significance of the exposures listed or whether a separate quantitative or qualitative analysis is required for each exposure. The respondent requested clarification.	The GL mentions that, in their stress testing, institutions should assess the relevance and significance of the following exposures to conduct risk and associated litigation costs: a) miss-selling of products, in both retail and wholesale markets; b) pushed cross-selling of products to retail customers, such as packaged bank accounts or add-on products customers do not need; c) conflicts of interest in conducting business; d) manipulation of benchmark interest rates, foreign exchange rates or any other financial instruments or indices to enhance the institution's profits; e) barriers to switching financial products during their lifetime and/or to switching financial service providers; f) poorly designed distribution channels that may enable conflicts of interest with false incentives; g) automatic renewals of products or exit penalties; and h) unfair processing of customer complaints. The EBA considers that the GL needs to provide sufficient degree of discretion when institutions analyse the exposures to conduct related risk and associated litigation costs. While in general no separate numbers need to be provided to all exposures, the institution should have a good idea of the main drivers. If an institution can come up with a way to determine a overall exposure without defining sub-exposures, it is sufficient to provide these overall numbers. But in case some individual sub-exposures deem relevant, they should be determined more granularly and included in the reported data.	No change

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Para 141 **Conduct related risk and associated litigation costs - projection of stressed conduct losses**	One respondent mentioned that it isn't quite in line with accounting policy, if "expected losses" is intended to mean the statistical probability-weighted concept. There's a recognition threshold of "more likely than not" that needs to be met before a provision needs to be considered. The respondent believes that IAS 37 covers this. For the GL the respondent would suggest replacing the final sentence with "Projected stressed conduct losses in excess of amounts provided for should be included the bank's assessment of potential capital needs." Another respondent mentioned that it should be clearly stated that requirements specified in this paragraph are addressed to banks which do not use an internal model for computing stress tests for operational risk. Another respondent requested clarification on how reputational loss, which is to be explicitly separated from operational risk and not assessed quantitatively, should be taken into account.	The GLs mentions that when measuring conduct-related risk institutions should consider (i) the uncertainty around provisions or expected losses originating from conduct related events; and (ii) extreme losses associated with tail risks (unexpected losses). Institutions should assess their capital needs under such events and scenarios and should also take into account the reputational effect of conduct losses. In principle expected losses from known conduct related issues should be covered by provisions and included in the profit and loss account Nevertheless the OpRisk requirements allow to deviate from the "more likely than not" separator and promotes the inclusion of losses earlier or on a higher level. Whereas the unexpected losses are quantified and covered by capital requirements from the institution. The paragraph could be changed to clarify the last sentence by adding that the possible excess of amounts after projection of stressed conduct losses should be included in the institutions' assessment of potential capital needs. The EBA considers that the paragraph does not apply only to banks which do not use an internal model for computing stress tests for operational risk. Nevertheless the EBA considers that the requirements for conduct risk stress testing are basically covered within institutions applying an internal model for operational risk. But in the same way as the 4.7.4 Operational Risk might need some fine tuning, 4.7.5 might also require some adaptions. Reputational loss is a separate risk category from operational	Para 141 changed to provide clarification regarding the projection of stressed conduct losses

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		risk, but reputational risks can be a consequence of different risks (including OpRisk) as expressed throughout the GL. If relevant reputational risk should be included into the ICAAP and the stress test as an individual risk category or within the limits of regulatory discretion added to one of the other categories – in deviation from the pillar I definitions..	
Para 142 **Conduct related risk and associated litigation costs – insufficient provisions**	One respondent observed that paragraph 142 includes the requirement to assess the impact of changes in the expected future conduct risk losses to be covered by capital and the capital plan. Whilst the respondent does not disagree with this requirement, the respondent believes that this is a general principle that covers all risks and conduct risk is no different to any other risks. The respondent believes that this point is made elsewhere in the CP and if the EBA considers it necessary to state this requirement that it does so within the general guidelines earlier in the CP. Another respondent mentioned that as is known, future losses are duly covered by means of provisioning under accounting rules. The respondent does not consider it appropriate to assess expected losses in excess of existing accounting provisions and factor these in projections.	The GLs mentions that in order to capture the risk that the provisions are insufficient or timely inconsistent, institutions should assess expected losses from conduct risk in excess of existing accounting provisions and factor these in their projections. Where appropriate, institutions should assess whether future profits will be sufficient to cover these additional losses or costs in the scenarios and incorporate this information in their capital plans. This requirement is mentioned to highlight the importance of the link between the possible expected losses from conduct risk - as part of the legal risk under the scope of operational risk - in excess of existing accounting provisions and the possible need to assess future profits to cover these additional losses or costs. In addition, it is also important to mention that such information should be clearly mentioned in institutions' capital plans.	No change
Para 144 **Conduct related risk and associated litigation costs – estimate for an**	One respondent mentioned that paragraph 144 stipulates requirements for an institution's ICAAP process. These do not directly refer to an institution's stress testing programme or processes and should therefore be excluded.	The GL mentions that in rare cases where an institution is unable to provide an estimate for an individual conduct related risk due to the extent of uncertainty, institutions should clarify that this is the case and provide evidence and assumptions supporting their assessment as part of their ICAAP.	Para 144 changed to provide clarification

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
individual conduct related risk		The EBA considers that the paragraph provides guidance for rare cases. In general an institution should be able to provide a quantification at least on an best afford basis The paragraph could be clarified by deleting "as part of their ICAAP".	
Para 149 **Liquidity risk – risk factors**	Two respondents noted that would welcome clarification as to whether the list of risk factors specified under this paragraph serve as a list of liquidity risk drivers for firms to measure themselves against.	The GL mentions that institutions should analyse risk factors relating to both asset and liability side items, as well as to off-balance-sheet commitments and that comprise, but are not limited to (with several examples): a) retail deposits run-offs; b) secured and unsecured wholesale funding; c) contingent cash flows/off-balance-sheet items; d) encumbrance and marketability of assets; and e) credit pipelines. The paragraph could be changed to clarify that institutions should analyse and measure themselves against risk factors.	Para 149 changed to provide clarification regarding risk factors
Para 151 **Liquidity risk – sensitivity analyses**	Two respondents mentioned that it is not clear from the paragraph what this requirement entails. The respondent would welcome clarification whether the paragraph sets out the approach for selecting liquidity risk drivers.	The GL mentions that institutions should subject these risk factors to sensitivity analyses which in turn should provide the appropriate quantitative background for the design of scenarios. The paragraph specifies the need for sensitivity analysis and scenario selection. The EBA considers that the GL needs to provide sufficient degree of discretion when institutions set out the approach for selecting liquidity risk factors.	No change
Para 153 **Liquidity risk – time**	Two respondents would welcome further clarification on the requirement related to time horizons for the	The GL mentions that institutions should design different time horizons in their stress testing: the time horizons should range	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
horizons	institution's stress testing. The paragraph should clarify whether the EBA's expectation is for all internal stress tests to include more prolonged stress assumptions or whether this is a general requirement which can be implemented relevant to specific risks where prolonged time horizons would add value to the stress testing results. Another respondent mentioned that (,,) Given the requirement of par. 153-154 of a liquidity risk stress test covering a time horizon of at least up to 12m, should the stress affect the NSFR as well?	from overnight up to at least 12 months; there should also be separate stress tests relating to intraday liquidity risk. The time period should display, for example, a short acute phase of stress (up to 30 days in order to cover such periods without having to change the business model) followed by a longer period of less acute but more prolonged stress (between 3 and 12 months). The paragraph states the different time horizons and does not call for all internal stress tests to include more prolonged assumptions.	
Para 154 **Liquidity risk – time horizons**	Two respondents asked if this paragraph relate to the run off of term liabilities (e.g. capital markets) beyond the 8 weeks horizon.	The GL mentions that institutions should combine the stress of the short to medium liquidity risk with a stress of funding risk, considering a time horizon of at least 12 months. Funding risk is defined in the Guidelines on common procedures and methodologies for the supervisory overview and evaluation process (SREP)	No change
Para 156 **Liquidity risk – design of scenarios**	Two respondents mentioned that liquidity stress is usually triggered by another stress event (e.g. large loss, fraud), which will be described in the stress test. It would be helpful if the Guidelines could provide some practical guidance with respect to the exact implementation of this paragraph. Would a scenario description that includes the applicable risk types for the liquidity stress suffice?	The GL mentions that in the design of scenarios, institutions should consider the impact of stress events for other risk types, e.g. credit risk losses, reputational risk events, to their liquidity position and the possibility of spillovers between institutions.	No change
Para 157 **Liquidity risk - frequency of the predicted net cash**	Two respondents mentioned that would welcome further clarity related to the frequency of the predicted net cash flows to ensure appropriate application. One of the respondents above asked if the intention of this	The GL mentions that the main methodology used for calculating the magnitude of the impact should be the net cash flow profile. For each scenario, at each stress level, the institution identifies cash inflows and outflows that are projected for each future time period and the resulting net cash flows. Institutions should	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
flows	paragraph is to ensure the frequency of future cash flow predictions to be daily for the entire stress period foreseen in the scenario.	consider the lowest cumulative point of net cash flows within the time period assessed in each given scenario. The EBA considers that the GL needs to provide sufficient degree of discretion and did not provide specific requirements regarding the frequency of cash flows since these should be determined based on individual portfolio and business models characteristics.	
Para 158 **Liquidity risk – solvency and profitability**	One respondent mentioned that would welcome further guidance related to point d) of this paragraph to understand how the liquidity stress tests are linked and/or integrated with the capital stress tests when assessing solvency/profitability. Another respondent mentioned that (…) Par. 158 d) mentions the "survival horizon": could an example of the computation of this metric be provided?	The GL mentions that institutions should extend the analysis, if appropriate, to other metrics, such as: a) liquidity ratios and other metrics used in the framework should include, but may not be limited to, supervisory liquidity ratios and metrics, in particular the liquidity coverage ratio and net stable funding ratio; b) their available liquidity buffer, over and above the ratios referred to above, and other counterbalancing measures, i.e. their counterbalancing capacity, for each stress scenario. Stress testing of this metric should be accompanied by an assessment of the impact on the proportion and nature of encumbered assets; c) the survival horizon of the institution as derived from its counterbalancing capacity, i.e. the institution's ability to hold, or have access to, excess liquidity over short-term, medium-term and long-term time horizons in response to stress scenarios as defined in the EBA Guidelines on common procedures and methodologies for SREP, and stressed cash flows, taken jointly, before and after the impact of counterbalancing measures; and d) solvency and profitability.	No change
Para 159 **Liquidity risk –**	One respondent mentioned that would welcome more clarity about the EBA's definition of central bank effects.	The GL mentions that when applying the different stress scenarios, institutions should assess and highlight	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
counterbalancing effects provided by central banks (monetary policy)	Another respondent mentioned that would welcome clarity regarding the definition of counterbalancing effects provided by central banks (monetary policy). Is this a reference to quantitative easing or a reference to day to day central bank facilities and facilities? Another respondent mentioned that the requirement to take into account central bank interventions (par. 159) should be better specified, so as to make clear what will be deemed acceptable assumptions.	counterbalancing effects provided by central banks (monetary policy) and adopt a conservative approach. The EBA considers that it is not a reference to any particular instrument or action from central banks but a reference to all possible instruments in general. In addition, it is out of the scope to define acceptable assumptions by institutions.	
Para 160 **Liquidity risk – currencies**	Two respondents suggested aligning the GLs with the Liquidity Coverage Ratio (LCR) delegated act to include all material currencies.	The GL mentions that liquidity stress test metrics should, if appropriate, include a granularity per currency to allow the analysis of for currency-specific assumptions in scenarios (e.g. volatility in exchange rates or currency mismatches). The paragraph could be clarified in order to include all material currencies.	Para 160 changed to provide clarification regarding currencies
Para 166 **Interest rate risk from non-trading activities – spread risk and option/behavioural risks**	Two respondents mentioned that this paragraph requires both a qualitative and a quantitative clarification, in particular with respect to spread risk. The two respondents also would welcome more information on how option/behavioural risks need to be stressed.	The GL mentions that institutions should consider the following elements: a) the spread risk, which arises from reference rates mismatching between time-matched funding and investments; b) early termination risks included in contracts with an embedded option, which might the institution into a new transaction on less favourable terms.	No change
Para 167 **Interest rate risk from non-trading activities – second order effects**	Two respondents mentioned that would welcome further guidance to understand expectations of which second order effects need to be covered and how they should be calculated (in particular with respect to correlation risks).	The GL mentions that institutions should be aware of potential indirect interest rate effects triggering losses elsewhere (e.g. that a pass-through onto lending rates could trigger further credit risk losses due to deteriorating customer ability to pay). The EBA considers that second round effect is sufficiently clear	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
		stated in this paragraph. In general, as stated in paragraph 101 the EBA expects second round effects to be considered to the extent possible.	
Para 168 **Interest rate risk from non-trading activities – complex financial instruments**	Two respondents mentioned that would suggest adding a more detailed description of 'less complex' and 'more complex' financial instrument. Another respondent mentioned that (….) Could the wording of par. 168 be clarified, as it would seem to envisage different types of IRR stress tests for different types of instruments?	The GL mentions that where less complex financial instruments are employed, institutions should calculate the effect of a shock using sensitivity analysis (without identification of the origin of the shock, and by means of the simple application of the shock to the portfolio). Where an institution uses more complex financial instruments on which the shock has multiple and indirect effects, it should use more advanced approaches with specific definition of the adverse (stress) situations reflecting relevant idiosyncratic risks. The EBA considers that the GL needs to provide sufficient degree of discretion and that is not the aim of the GL to provide an exhaustive list of instruments.	No change
Para 169 **Concentration risk**	Two respondents mentioned that would be helpful to specify in the GL that concentration risk elements are captured as part of the Pillar 2 process and not as a standalone stress testing category.	The GL mentions that stress testing should be a key tool in the identification of concentration risk, as it allows institutions to identify interdependencies between exposures, which may only become apparent in stressed conditions as well as hidden concentrations. The EBA considers that concentration risk elements are expected to be considered part of the stress testing framework since it can be a major source of vulnerability, and not only captured as part of the Pillar 2 process.	Para 169 changed to provide clarification regarding concentration risk
Para 172 **Concentration risk -**	One respondent mentioned that with regard to concentration risk, correlations between risk factors are to	The GL mentions that stress tests should take into account changes in the business environment that may occur which	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
changes in the business environment	be increased and extreme changes in risk parameters to be stressed, taking into account second round effects in the process (paragraph 172). Such deliverables can only be computed on a statistically uncertain basis and do not lead to more acceptance of stress testing among decision-makers in institutions.	would lead to the materialisation of concentration risk. In particular, stress tests should consider unusual but plausible changes in correlations between various types of risk factors as well as extreme and unusual changes in risk parameters, going beyond single risk factors, to look at scenarios that take account of interrelated risk factors and that feature not only first round but also feedback effects. The EBA considers that the paragraph is clear and that institutions have the opportunity to demonstrate the quality and limitations of the calculations when taking into account changes in the business environment that may occur which would lead to the materialisation of concentration risk.	
Para 175 **Concentration risk – indicators**	One respondent mentioned that the concentration risk indicators mentioned in paragraph 175 (Herfindahl-Hirschman Index -HHI and Gini coefficients) produce pressure on institutions to justify themselves if they do not use these indicators. It would be better not to mention any indicators here. These indicators should, at any rate, only be mentioned as possible aids to analysis and not specified in the form of an exhaustive list. Furthermore, the respondent regarded the established indicators such as marginal value-at-risk as appropriate and adequate to capture concentration risk in credit risk.	The GL mentions that in order to assess the ex-ante level of concentration risk and/or impact of the scenario on the concentration level, institutions should, where appropriate, consider more or less complex measures, for instance the Herfindahl-Hirschman Index (HHI) and Gini coefficients. The EBA considers that the concentration risk indicators mentioned in the paragraph are just examples of possible indicators.	No change
Para 177 **FX lending risk – unhedged borrower**	Two respondents suggested that the definition of 'unhedged borrower' in the FX lending risk area be aligned with the definition of the final EBA GL/2013/02. One of the respondents above also suggested to allow for a materiality threshold to determine whether FX lending risk is relevant for an institution.	The GL mentions that institutions should take into account that FX lending risk: a)may arise from the unhedged borrower's inability to service debt denominated in currencies other than the currency of the Member State that the institution has been authorised; b) is related to pure credit and FX market risk; c) is characterised by non-linear relationship of credit and FX market risk components; d) is influenced by the general	Para 177 changed to provide clarification regarding the definition of 'unhedged borrower'

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	Another respondent mentioned that FX lending to "unhedged borrowers" should be confined expressly to retail clients and SMEs (similar to paragraph 2 of the Final Guidelines on capital measures for foreign currency lending to unhedged borrowers under the SREP of 20 December 2103). The respondent mentions also that the iimplementation of the final guidelines on capital measures for foreign currency lending to unhedged borrowers under the SREP (paragraph 9) is required from a materiality threshold of 10%: "These guidelines apply on an institution-by-institution basis wherever the following threshold of materiality is met: Loans denominated in foreign currency to unhedged borrowers constitute at least 10 % of an institution's total loan book (total loans to non-financial corporations and households), where such total loan book constitutes at least 25 % of the institution's total assets." Only once this threshold is exceeded do significantly expanded risk management requirements – stress testing, for example – apply. In respondent views, this materiality threshold should be taken into account in the present consultation paper. The respondent believes this is necessary to ensure uniformity in the treatment of FX lending to unhedged borrowers under the SREP.	exchange rate risk; and e) may arise from conduct risk. The EBA GL/2013/02 was repealed with effect from 1 January 2016. However the concept was included in EBA/GL/2014/13. The EBA considers that the paragraph could be clarified to specify that 'unhedged borrower' means 'retail and SME borrowers without a natural or financial hedge which are exposed to a currency mismatch between the loan currency and the hedge currency.' as defined in EBA/GL/2014/13. The EBA considers that the GL needs to provide sufficient degree of discretion when institutions set out the materiality to determine whether FX lending risk is relevant for institutions, so no minimum threshold is defined.	
Para 182 **FX lending risk – items to take into account**	One respondent understands the intention behind the guidance on this matter, in light of certain experiences by certain institutions in some countries. The respondent is of the opinion that these matters are best dealt within the modelling of the input values, PD, LGD, EaD and thus the GLs of these matters should be incorporated where appropriate in other RTS.	The GLs mentions that when stress testing the FX lending risk, institutions should at least take into account: a) the type of exchange rate regime and how this could impact on the evolution of the FX rate between domestic and foreign currencies; b) the sensitivity impact of exchange rate movements on the borrowers' credit rating/scoring and debt servicing capacity; c) potential concentrations of lending activity in a single foreign currency or in a limited number of	No change

Comments	Summary of responses received	EBA analysis	Amendments to the proposals
	Two respondents mentioned that according to para 182 e) IRBA models should reflect FX risks by increased risk weights. The respondent mentioned that such a requirement would need to be formulated in the Capital Requirements Regulation (CRR) rather than in a stress guideline and should be deleted in the GLs given that CRR is not addressing this requirement.	highly correlated foreign currencies; d) potential concentrations of lending activity in some specific sectors of the economy in the country currency and respective evolution of such sectors highly correlated with foreign currencies; and e) the ability to secure financing for this type of portfolio. For institutions applying internal models for the calculation of credit risk capital requirements, the additional risk related to lending in FX currencies should be reflected in higher risk weights of such assets. The non-exhaustive list of variables used in the models should include interest rates disparities, loan LTV, currency cross correlation and volatility. The EBA considers that some items are, indeed, possible to be dealt within the modelling areas. However, the GLs need to mention these items on a broader way, and not so specifically incorporated through modelling and risk parameters such as PD, LGDs, EADs, etc. Among many reasons, many institutions do not use internal models for all the possible items and the principle of proportionality should also be considered. The EBA considers that, regardless of the implications for institutions applying internal models and calculating credit risk capital requirements, the additional risk related to lending in FX currencies should also be reflected in the results of stress testing (e.g. additional losses).	
Para 184 **FX lending risk – legal regime and respective jurisdiction**	One respondent considers that para 184 requires an institution to make a judgment on all jurisdictions in which it has an obligor with an exposure to currencies other than the local currency. This requires even a judgment on each member of the EU as well as G20 countries etc.	The GL mentions that while assessing potential impact of FX lending on profitability in a certain scenario, institutions should, where appropriate, include the legal regime and the relevant jurisdiction, that may force institutions to denominate FX lending into domestic currency at exchange rates significantly below	No change

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	The respondent considers that this is an unreasonable burden on an institution. Or it may be helpful for the GLs to clarify that this standard only applies to countries with fixed / pegged exchange rate policies.	market ones. The EBA considers that the paragraph already mentions that the inclusion of the legal regime and the relevant jurisdiction should be done only where appropriate. The EBA considers that paragraph 184 does not require an institution to make a judgment on all jurisdictions in which it has an obligor with an exposure to currencies, but only where appropriate.	
Para 185 **Application of stress testing programmes - stress testing for ICAAP/ILAAP purposes**	One respondent mentioned that the requirement would appear to be to conduct stress tests in which liquidity and capital stresses interact and may result in feedback loops. The respondent is of the opinion that this adds a level of complexity to the stress-testing exercise. Whereas the GLs appear to acknowledge in para 96 that "Due to the different objectives of the two sets of reversed stress tests the stress tests for ICAAP and ILAAP purposes and recovery planning should not be interlinked but compared to one another. " The respondent agrees with the GL that recovery plan and reverse stress test for ICAAP and ILAAP should not be interlinked. The respondent encourages reviewing the GLs with respect to the mixing and of ICAAP and ILAAP as set out in section 4.7.1. - Application of stress testing programmes. The respondent preference is for the EBA to give guidance for institutions to develop consistent scenarios that stress liquidity and capital separately and then to assess the overall impact. This may allow an assessment where vulnerabilities may be. One respondent mentioned that would appreciate a	The GL mentions that as part of their internal capital and liquidity adequacy assessment processes (ICAAP and ILAAP) institutions should ensure that they have enough capital and liquidity resources to cover for the risks institutions are, or might be, exposed to, and ensure appropriate allocation of capital and liquidity resources across the entities of an institution over the economic cycle. This assessment should be reflected in the institution's capital and liquidity plans that institutions should submit to the competent authorities as part of ICAAP and ILAAP information. The EBA considers that the section 4.7.1. Application of stress testing programmes - Stress testing for ICAAP/ILAAP purposes does not require to conduct stress tests in which liquidity and capital stresses interact and may result in feedback loops. The section does not mention any need for interlinkage between ICAAP and ILAAP to estimate respective impacts. The principle of proportionality is recognised and applies to all aspects of these guidelines, including the methodology, as well as the frequency and the degree of detail of the stress tests. The background and rationale section and Part 4 – Institutions' stress	No change

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	rephrasing of this paragraph to restrict Legal Entity stress requirements to the most significant entities only. GSIBs in particular face having: (i) many legal entities; and (ii) entities which don't operate under the consolidated group regime but under the local regulatory framework. As a consequence, a simple breakdown of group level stress results into all Legal Entities is not only tedious but does not generate the locally required metrics. The respondent would suggest the EBA reconsidering this requirement.	testing contains very clear statements on proportionality instead of restricting the GL to the most significant entities only.	
Para 187 **Application of stress testing programmes – stress testing for ICAAP/ILAAP purposes**	One respondent mentioned that paragraph 187 creates uncertainty around the exact application, given that internal stress testing models for material risks and subcategories vary by institution. The respondent would suggest adding some wording in the GLs in order to ensure firms can continue to apply their internal stress testing methodology. Another respondent mentioned that paragraph 187, point c) for globally active institutions that also have to use the ICAAP in the APAC region, the requirement to perform "comprehensive institution-wide stress testing …reflecting all entities" poses considerable problems. The APAC ICAAP is, as has been demonstrated, subject locally to other rules that are not compatible with the European approach. Should European and APAC rules not be aligned, the respondent requested deletion of this paragraph. The same respondent mentioned that in paragraph 187, point d) a minimum period for ICAAP stress tests makes no sense because the ICAAP should cover all overarching scenarios, also rapid impact ones. At best, a requirement to at least assess a scenario with a minimum duration of two years	The GL mentions that in addition to the general requirements related to institution's stress testing programmes specified in these Guidelines, stress tests used for ICAAP/ILAAP purposes should meet the following specific requirements: a) institutions should cover all material risk categories (and sub-categories) that the institutions are exposed with regard to both on- and off-balance sheet assets and liabilities in relation to all material portfolios or sectors /geographies, including relevant structured entities; b) a range of scenarios should be considered including at least an adverse economic scenario that is severe but plausible, such as a severe economic downturn and/or a market wide-wide and idiosyncratic shock to liquidity; c) ICAAP and ILAAP stress testing should be performed through a comprehensive institution-wide stress testing and reflect all entities on which ICAAPs or ILAAPs are required; d) ICAAP and ILAAP stress tests should cover the same forward-looking period as the institution's ICAAP and ILAAP respectively, and be updated at least as regularly as the ICAAP and ILAAP. ICAAP stress tests should cover a period of at least two years. The previous guidelines (GL32) published in 2010 remain largely	No change

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	makes sense. In addition, it should be explained how the two-year time horizon is to be understood. Does it mean a rolling period of two years from the date the stress test is set up, the next two accounting reference dates, or the earliest future accounting reference date that is more than two years after the date of the stress test?	valid. The EBA understands the challenges for the further development of stress testing programmes based on best practices and that are going beyond the status quo for many institutions. The EBA recognises that institutions after the application date will continue to develop and enhance their systems and processes to meet supervisory expectations. The institutions will apply their internal stress testing methodology according to supervisory expectations. These guidelines aim at achieving convergence of practices followed by institutions and competent authorities for stress testing across the EU and are not subject locally to other rules that are not compatible with the EU approach. The EBA considers that the GL needs to provide sufficient degree of discretion in how the two-year time horizon is implemented.	
Para 195 **Application of stress testing programmes - management actions**	One respondent mentioned that the large number of stress tests is again increased many times over if the impact of stress testing before and after management actions has to be explained (paragraph 195).	The GL mentions that institutions should explain the qualitative and quantitative impact of the stress before and after mitigating management actions. The impact before management actions should include assumptions about strategy, growth and associated revenue, but exclude management actions that would not be available in a stress such as winding down a business line or raising capital. The previous guidelines (GL32) published in 2010 remain largely valid. The EBA understands the challenges for the further development of stress testing programmes based on best practices and that are going beyond the status quo for many	No change

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		institutions. Comprehensive explanations of the impacts are not necessarily linked to the number of stress tests.	
Para 198 **Supervisory assessment of the institutions' stress testing (CAs review and assessment of the institutions' compliance with GLs)**	One respondent mentioned that has some concerns about the potential reach of the requirement for CAs to review institutions' compliance with the Guidelines in practice (para 198). Demonstrating compliance with all the Guidelines could require large amounts of documentation (policies, minutes, methodological notes, etc.) which may result in paper tigers instead of improving the quality of an institution's stress test practices. The respondent therefore urges the EBA to ensure that compliance does not become a "box ticking" exercise and to focus on key objectives.	CAs review and assessment of the institutions' compliance with these guidelines should form part of the supervisory assessment of the institutions' risk management framework conducted under SREP, in particular in relation to the assessment of the stress testing programmes, governance arrangements, data infrastructure, use of stress testing in ICAAP and ILAAP and management actions. The principle of proportionality is recognised and applies to all aspects of these guidelines, including the methodology, as well as the frequency and the degree of detail of the stress tests. The institution should ensure that the compliance with GLs is well supported, transparent, consistent and repeatable over time. Limited concise documentation without clear demonstrations, poorly organised and not based on objective judgements and empirical support are many times associated with weaker practices.	No change

Responses received in public consultations (public) for the draft Guidelines on stress testing and supervisory stress testing.

1. Association for Financial Markets in Europe (AFME)
2. BNP Paribas (BNPP)
3. British Bankers' Association (BBA)
4. Building Societies Association (BSA)
5. Deutsche Bank (DB)
6. Euroclear
7. European Banking Federation (EBF)

8. European Federation of Building Societies (EFBS)
9. French Banking Federation (FBF)
10. Nationwide Building Society (Nationwide)
11. Portuguese Banking Association (APB)
12. Santander
13. Swedish Bankers' Association (SBA)
14. UniCredit

In addition, one confidential response was submitted.