

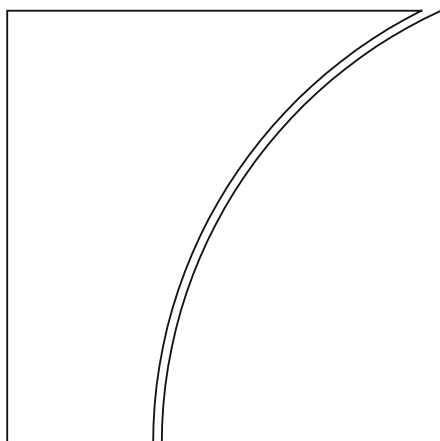
# Basel Committee on Banking Supervision

## Consultative Document

### Stress testing principles

Issued for comment by 23 March 2018

December 2017



**BANK FOR INTERNATIONAL SETTLEMENTS**

This publication is available on the BIS website ([www.bis.org](http://www.bis.org)).

© *Bank for International Settlements 2017. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated.*

ISBN 978-92-9259-125-0 (online)

Contents

Introduction..... 5

Proposed text of the revised stress testing principles..... 6

Annex 1: Comparison of current principles and proposed new principles .....15



## Introduction

The Basel Committee's stress testing principles were published in May 2009.<sup>1</sup> They were designed to address key weaknesses in stress testing practices that were highlighted by the global financial crisis. Since then, the role of stress testing has rapidly evolved and grown in importance in many jurisdictions. Stress testing is now a critical element of risk management for banks and a core tool for banking supervisors and macroprudential authorities.

Given the rapid evolution of stress testing in recent years, the Committee undertook a detailed review of current supervisory and bank practices in this area.<sup>2</sup> It is clear from this review that the stress testing frameworks that have been developed since the global financial crisis go well beyond those that were envisaged when the current stress testing principles were published in May 2009. The increasing importance of stress testing, combined with a significant range of approaches adopted by supervisory authorities and banks, highlight the continued need for a set of principles to govern stress testing frameworks. These factors also suggest that the principles themselves should be stated at a sufficiently high level to avoid impeding innovation in this rapidly evolving area.

During the course of 2017, the Committee undertook a review of its current set of stress testing principles. As a result of this review it proposes in this consultative document to replace the existing set of principles with a new streamlined version that states the principles at a high enough level to be applicable across many banks and jurisdictions and is more robust to developments in stress testing practices over time. National authorities may wish to use the principles in designing their own stress testing rules, guidance or frameworks.

Although the proposed new principles are shorter than the current ones, in both number and length, this does not represent a reduction in the importance of the principles. On the contrary, by expressing sound stress testing principles at an appropriately high level, the Committee aims to ensure that they can be used by jurisdictions to guide all elements of a sound stress testing framework. In addition, given the widespread use of supervisory stress tests that has evolved in recent years, all principles now apply to authorities as well as banks, rather than being split between the two as in the current set of principles.

In addition to stating the principles at a high-level, streamlining is also achieved by removing overlaps and by reducing the amount of descriptive text that accompanies each principle. In the future, descriptions of stress testing practices will instead be set out in separate reports that the Committee may publish periodically, such as the range of practices report that was published concurrent with this consultative document. As a result, the new principles are designed to be more enduring and less dependent on the current context of stress testing, as they focus on high level concepts such as governance.

The text of the proposed new stress testing principles is set out in the next section of this consultative document. For comparison purposes, the current principles are set out in Annex 1, together with a description of how the current and proposed new principles relate to each other.

The Committee welcomes comments on all aspects of the proposed new principles. Comments should be uploaded by 23 March 2018 using the following link: [www.bis.org/bcbs/commentupload.htm](http://www.bis.org/bcbs/commentupload.htm). All comments will be published on the website of the Bank for International Settlements (BIS) unless a respondent specifically requests confidential treatment.

<sup>1</sup> See *Principles for sound stress testing practices and supervision*: [www.bis.org/publ/bcbs155.pdf](http://www.bis.org/publ/bcbs155.pdf)

<sup>2</sup> See *Supervisory and bank stress testing: range of practices*: [www.bis.org/bcbs/publ/d427.pdf](http://www.bis.org/bcbs/publ/d427.pdf)

# Proposed text of the revised stress testing principles

## Introduction

The following principles cover sound stress testing practises<sup>3</sup> and are formulated with a view towards application to large, internationally active banks and to supervisory and other relevant financial authorities in Basel Committee member jurisdictions. However, smaller banks and authorities in all jurisdictions can benefit from considering in a structured way the potential impact of adverse scenarios on their business, even if they are not using a formal stress testing framework but instead using simpler methods. These principles are therefore intended to be applied on a proportionate basis, depending on size, complexity and risk profile of the bank or banking sector for which the authority is responsible.

These principles do not constitute *Standards*, for which the Basel Committee expects full implementation by all of its members and the internationally active banks that they supervise. Instead the principles are *Guidelines* that focus on the core elements of *stress testing frameworks*,<sup>4</sup> such as objectives, governance, policies, processes, methodology, resources, and documentation that may guide stress testing activities and facilitate their use, implementation and oversight.

Each principle is followed by a short description of considerations that are equally relevant for both banks and for authorities. This description is followed by two additional sets of points applicable to either, where relevant:

- *Additional points for banks:* These cover additional points with particular relevance to (a) banks' own internal stress testing activities, and (b) their participation in bank-run supervisory stress tests.
- *Additional points for authorities:* These cover additional points with particular relevance to (a) supervisor-run stress tests, and (b) the authorities' role in bank-run supervisory stress tests. They also cover the role of authorities in their oversight of banks' internal stress testing activities.

## 1. Stress testing frameworks should have clearly articulated and formally adopted objectives

Stress testing frameworks should be designed to meet clear objectives that are documented and approved at the board level of the organisation, or an appropriately senior-level governance body. The objectives should be the basis to set out requirements and expectations of the framework, and should be consistent with the risk management framework of the bank and its overall governance structure.

Staff that are involved in the implementation of stress testing frameworks should also have a clear understanding of the objectives of the framework, as this will help to guide any discretionary or judgemental elements.

<sup>3</sup> The references to stress tests throughout the principles encompasses a range of stress testing methodologies, from sensitivity analysis, to more complex scenario analysis (including enterprise-wide stress tests) and reverse stress testing.

<sup>4</sup> Relevant terminology can be found in the Committee's stress testing taxonomy. For the latest version of the taxonomy available at the date of publication, please see Annex 1 of *Supervisory and bank stress testing: range of practices* ([www.bis.org/bcbs/publ/d427.pdf](http://www.bis.org/bcbs/publ/d427.pdf)).

### *Additional points for banks:*

For banks' internal stress testing frameworks, the relevant high-level objectives should align to the bank's risk appetite and risk management framework, and may relate, for example, to the use of stress tests to inform capital and liquidity planning or to its role as an integral element of risk management.

### *Additional points for authorities:*

For authorities, relevant high level objectives may relate to, for example: (i) assessing the adequacy of levels of capital or liquidity of supervised banks; (ii) fostering banks' own stress testing and risk management capabilities; (iii) supporting other supervisory activities (eg on-site inspections, further in-depth analysis); (iv) providing a quantitative assessment of banks' risk profiles, both for individual banks and for the banking system in aggregate; or (v) contributing to market confidence or strengthening market discipline.

## 2. Stress testing frameworks should include an effective governance structure

Stress testing frameworks should include an effective governance structure that is clear, comprehensive and documented. This should specify the roles and responsibilities of senior management, oversight bodies and those responsible for the ongoing operation of the stress testing framework. This governance framework should ensure a full and consistent oversight and monitoring of the actions taken at the different stages of the stress testing process.

Roles and responsibilities should be specified for all aspects of the stress testing framework, including: scenario development and approval, model development and validation, reporting and challenge of results and the use of stress test outputs. The roles of the second and third lines of defence should be specified (ie risk management and compliance, and internal audit, respectively). Policies and procedures should cover all aspects of the stress testing framework, be clearly documented, kept up-to-date and be approved by the board and/or senior management.

The stress testing framework should also ensure collaboration of all necessary stakeholders and the appropriate communication to stakeholders of the stress testing assumptions, methodologies, scenarios and results. The engagement structure should facilitate credible challenge of the stress testing framework, both at senior and technical expert levels, including not only assumptions, methodologies, scenarios and results, but also the assessment of its ongoing performance and effectiveness, and the remediation of gaps identified by key stakeholders.

### *Additional points for banks:*

For banks' internal stress testing frameworks, all aspects of the governance arrangements should be specified by the bank, subject to compliance with international best practices including the Basel Committee's *Corporate governance principles for banks*.<sup>5</sup> The banks' boards of directors should have the ultimate responsibility for the overall stress testing framework, including the oversight of the framework. The development and implementation of the stress testing framework may be delegated to senior management or a stress testing committee. The board, or an appropriately senior-level governance body, is expected to have an understanding of the material aspects of the stress testing framework that enables it to actively engage in discussions with senior management or senior experts that are responsible for stress testing and challenge key modelling assumptions, the scenario selection and the assumptions underlying the stress tests.

<sup>5</sup> Available at [www.bis.org/bcbs/publ/d328.pdf](http://www.bis.org/bcbs/publ/d328.pdf)

For bank-run supervisory stress tests, banks should document the governance arrangements that specify their own specific roles in these exercises. For example, relevant responsibilities likely relate to data quality control, interactions with supervisory authorities on interpretative issues, and modelling choices where these are not specified by the authority.

The bank functions that should be engaged in a given stress test exercise depend on a number of factors, including: the objectives of the framework, or particular stress test, whether it is an internal stress test or a bank-run supervisory exercise, and the specific structure of the bank itself. Examples of bank functions that are likely to be relevant include: economics, risk, finance, strategy, and the front line businesses.

#### *Additional points for authorities:*

Authorities should ensure that a comprehensive governance structure for all aspects of their stress testing framework is formulated by key stakeholders. The process should document a delineation of the roles for all relevant participants in the stress testing framework, inter-department (agency) coordination, and the nature and frequency of the communication of the results.

Stress testing often involves multiple units within the authority; the governance structure should guide alignment between macro-prudential and micro-prudential functions (eg such alignment could be in terms of scenario development, data sharing, data validation and the use of outputs from all stress test exercises).

### 3. Stress testing should be used as a risk management tool and to inform business decisions

Stress testing is a forward-looking risk management tool that constitutes a key input into banks' and authorities' activities related to risk identification, monitoring and assessment. As such, stress testing should also contribute to formulating and pursuing strategic and policy objectives.

When using the results of stress tests, banks and authorities should have a clear understanding of their key assumptions and limitations, for instance in terms of scenario relevance, risk coverage and model risk.

To be a meaningful risk management tool, stress tests should be undertaken regularly. While ad hoc stress tests may be performed for specific reasons, generally stress tests should be undertaken, according to a well-defined schedule. The appropriate frequency will depend on several factors, including: the objectives of the stress test framework, the scope of the stress test, the size and complexity of the bank or banking sector, as well as changes in the macroeconomic environment.

#### *Additional points for banks:*

Banks should make sure that results of stress tests, and any other relevant findings, are effectively used in accordance with the objectives and internal policies and procedures of the stress testing framework. These uses should provide insight to the board and senior management, to inform key decisions in the direction and management of the bank. For that purpose, the stress test results should be reported to the board and senior management on a regular basis, at relevant levels of aggregation. The reports should include the main modelling and scenario assumptions as well as any significant limitations.

Results of stress tests should, where appropriate, inform banks' calibration of risk appetite and limits, financial and capital planning, liquidity and funding risk assessment, contingency planning and recovery and resolution planning. For instance, internal stress tests should support their internal capital adequacy assessments and their internal assessments of liquidity adequacy. Moreover, stress testing results should be used, where appropriate, to support portfolio management, new trade/product approval



processes and to inform other corporate decision-making processes such as the evaluation of strategic options.

*Additional points for authorities:*

Authorities should make sure that stress tests are critically evaluated and properly integrated in their supervisory and/or financial stability programmes to be used along with other available analytical and/or policy instruments.

Authorities may use stress testing results as one of the inputs of the supervisory process. For instance, quantitative and qualitative outcomes of stress tests should help to identify risks and vulnerabilities to which banks may be exposed, assess banks' capital and liquidity adequacy, as well as, where appropriate, inform reviews of banks' internal governance and risk management arrangements. When authorities use stress tests to assess banks' capital and liquidity adequacy (eg through Pillar 2), they should also consider the appropriate supervisory responses to any deficiencies that are identified, which may include expectations for additional capital depending on the authority's supervisory approach.

Authorities may also use, where appropriate and relevant, stress testing outcomes for macroprudential purposes, such as:

- To identify and assess risks and vulnerabilities at systemic level, possibly including additional sources of stress (eg feedback/second round effects).
- To quantify the capital needs at systemic level during a time of crisis.
- To inform the calibration of macroprudential policies and instruments.

Where management actions are part of the banks' supervisory stress testing submissions, authorities should consider whether the proposed actions are part of, or consistent with, the banks' other strategic plans (such as recovery plans).

#### 4. Stress testing frameworks should capture material and relevant risks and apply stresses that are sufficiently severe

Stress testing frameworks should capture material and relevant risks, as determined by a sound risk identification process. The risk identification process should include a comprehensive assessment of risks, including those deriving from both on- and off-balance sheet exposures, earnings vulnerabilities, and other factors that could affect the solvency or liquidity position of the bank (or banks in the case of supervisory stress tests).

Stress test scenarios should be designed to capture material and relevant risks identified in the risk identification process and key variables within each scenario should be internally consistent. A narrative should articulate how the scenario captures the risks. If certain material and relevant risks are excluded from the scenarios, their exclusion should be explained and documented. The scenarios should be sufficiently severe and varied, given the objective of the exercise, to provide a meaningful test of the resilience of banks. That is, the scenarios should be sufficiently severe but plausible.

The scenarios and sensitivities that are used in stress tests should be reviewed periodically to ensure that they remain relevant. Consideration should be given to historical events and hypothetical future events that take into account new information and emerging risks in the present and foreseeable future. 'Ahistorical' scenarios may be warranted if new or heightened vulnerabilities are being identified, or if historical data do not contain a severe crisis episode. The scenarios and the sensitivities should also take into account the current macroeconomic and financial environment.

#### *Additional points for banks:*

The scenarios and sensitivities that banks use for their internal stress tests should not be limited to those used in prescribed supervisory stress tests, although benchmarking to supervisory stress tests can be a useful exercise. Banks should ensure that scenarios are tailored to their businesses and address their bank-specific vulnerabilities. Reverse stress tests explore scenarios that could potentially lead banks to fail and thus can be useful in helping banks to identify their core vulnerabilities. In designing their own scenarios, banks should carefully determine the characteristics of each scenario, such as severity of the stress and the types of risks that are taken into account, so that they reflect the board's risk appetite and objectives. This design process must be transparent to internal and relevant external stakeholders (such as the banks' supervisors).

Banks should conduct their internal stress tests at relevant levels of their organisation, consistent with the objectives (eg at portfolio level, business unit, at firm-wide level (consolidation, solo or sub-consolidated)). When looking at risks at a bank-wide level particular attention should be paid to risk concentrations. The bank's strategic orientation and its economic environment should likewise be taken into consideration when defining the stress test's scope and scenarios.

#### *Additional points for authorities:*

When developing stress test scenarios, authorities should take into account identified specific features or vulnerabilities of individual banks (eg their risk profiles and business models) and/or the banking sector as a whole. To the extent possible, they should also take into account emerging risks if these are relevant to the objective of the stress test. Authorities may also consider developments in banks' internal scenarios and sensitivity analyses.

Authorities should evaluate whether a common scenario could be applicable to the whole banking sector or whether several tailored scenarios for specific parts of the banking sector would be more adequate for conducting supervisory stress tests.

### **5. Resources and organisational structures should be adequate to meet the objectives of the stress testing framework**

Stress testing frameworks should have organisational structures that are adequate to meet their objectives. Governance processes should ensure the adequacy of resourcing for stress testing, including ensuring that resources have the appropriate skill sets to execute the framework. Resourcing decisions should take account of the fact that stress tests have become more sophisticated over time, increasing the need for specialised staff, systems and IT infrastructure.

Processes to ensure resources have the appropriate skill sets could include building the skills of internal staff, knowledge transfer to internal staff, as well as hiring personnel with specialised stress testing skills. The set of skills typically required include (but are not limited to) expertise in: liquidity risk, credit risk, market risk, capital rules, financial accounting, modelling, and project management.

#### *Additional points for banks:*

Banks should ensure effective policies and internal controls are in place to govern systems and processes used in both their own internal stress testing exercise, and their participation in bank-run supervisory exercises.

Banks that adopt centralised approaches to their stress testing activities should ensure that governance systems are in place to facilitate insights from business lines, such as how their portfolios will be impacted by the stress scenarios. Banks that adopt decentralised approaches should have group level

policies, procedures and controls to ensure that there is sufficient consistency in how stress scenarios are translated into impacts that can be aggregated to give a coherent view of risks the bank is facing.

If services supplied by third parties are used by banks to supplement internal resources, policies and procedures should establish appropriate due diligence, oversight and control consistent with sound third party risk management.

*Additional points for authorities:*

Both bank-run and supervisor-run (ie top-down) supervisory stress tests can be resource intensive, requiring specialised staff, systems and IT infrastructure. Authorities should ensure that resources and the organisational structure are adequate given the complexity of the exercises. For example, authorities should consider the resources needed to interact with the banks that participate in the exercises, eg processes and infrastructure to address clarifying questions from banks, interact with banks to check data quality/discrepancies, and provide feedback to the banks on the results of the exercises.

## 6. Stress tests should be supported by accurate and sufficiently granular data and by robust IT systems

In order for risks to be identified and the results of stress tests to be reliable, the data used should be accurate and complete, and available at a sufficiently granular level and in a timely manner.

Both banks and authorities should have in place a robust data infrastructure capable of retrieving, processing, and reporting information used in stress tests that ensure that the information is of adequate quality to meet the objectives of the stress testing framework. Processes should be in place to address any identified material information deficiencies.

*Additional points for banks:*

The infrastructure capabilities of banks should be flexible enough to retrieve data for use in both internal stress tests and the bank's involvement in any bank-run supervisory stress tests. Where appropriate, banks should ensure consistency of data sources, processing, and aggregation across its stress tests. Banks should ensure the data they produce for stress testing purposes are coherent with their overall risk management framework.

Banks should also collect, quality assure, and maintain historical data relevant for their internal stress testing frameworks. Banks should ensure that they are able to accurately integrate data associated with mergers and acquisitions with their historical data set.

The BCBS *Principles for effective risk data aggregation and risk reporting*<sup>6</sup> should guide banks in building up, revising and improving their capabilities in the use of data to enhance their ability to identify and manage bank-wide risks. In particular, banks' risk data aggregation capabilities should be subject to strong governance arrangements, should be supported by an adequate data architecture and IT infrastructure, and should be able to capture and aggregate all material risk data across the banking group.

The infrastructure should be sufficiently flexible to allow for targeted or ad hoc stress tests in times of rapidly changing market conditions and to meet on-demand requests both arising from internal needs and externally from supervisory queries.

<sup>6</sup> Available at [www.bis.org/publ/bcbs239.pdf](http://www.bis.org/publ/bcbs239.pdf)

#### *Additional points for authorities:*

Authorities should leverage, to the extent possible, data that are already provided by banks to authorities, such as through banks' regular supervisory reporting. Authorities should ensure consistency of data sources to the extent possible when aggregating data within supervisory stress tests, or across multiple stress tests.

Authorities should review and foster improvement of banks' data quality and risk data aggregation capabilities as part of on-going supervision.

### **7. Models and methodologies to assess the impacts of scenarios and sensitivities should be fit for purpose**

The models and methodologies used to derive stress estimates and impacts should fit to the purpose and intended use of the stress tests. This implies:

- the need to adequately define at the modelling stage the coverage, segmentation and granularity of the data and types of risks in line with the objectives of the stress test framework;
- the level of sophistication of the models should be appropriate for both the objectives of the exercise and the type and materiality of the portfolios being monitored using the models; and
- the models and other methodologies used for stress tests should be well-justified and documented.

Sound model development requires the collaboration of different experts. The model developers should engage with stakeholders to gain insights into the risks being modelled and to identify the business objectives, business drivers, risk factors and other associated business information that are relevant given the objectives of the stress testing framework (eg market, product or portfolio types, nature and materiality of risk exposures). The modelling choices and calibration decisions should consider the interactions between different risk types, as well as the linkages between models. In this regard, the links between solvency and liquidity stresses should be considered. The collaboration of model developers and stakeholders is particularly important for bank-wide stress testing to ensure the inclusion of all material risks and a sound aggregation of results.

Stress tests employ a certain amount of expert judgement, including assumptions within a model or methodology. In some cases model overlays are appropriate. Like the models, these overlays or expert judgements should be well-justified, documented and subject to credible challenge.

#### *Additional points for banks:*

The mix of a bank's business lines, its strategy, the risk characteristics of its activities/exposures and the objective of the stress testing exercise should guide the development of appropriate models. Banks should consider a range of methodologies to quantify the stress impacts, ranging from, for instance, point-in-time static approaches to more sophisticated dynamic simulations that reflect future business activities and management actions.

Banks should ensure that adequate model inventory and model management processes are in place for their stress testing activities, including a robust model validation function. The documentation of models used for stress testing, including performance testing, should be maintained and made available to senior management and other internal and external stakeholders, such as supervisors.

#### *Additional points for authorities:*

Authorities that use stress testing to achieve microprudential objectives should review and challenge banks' model outputs, for example via review of backtesting results or peer benchmarking. They can use

their own assessment criteria and through their supervisory process can require banks to improve their modelling and model governance procedures where needed. As part of that evaluation process, authorities may develop their own models for benchmarking or challenge purposes.

Where authorities have macroprudential objectives, their models may incorporate cross bank features such as system-wide feedback or contagion.

## 8. Stress testing models, results and frameworks should be subject to challenge and regular review

Regular review and challenge are key steps in the stress testing process for both banks and authorities. They are critical to improving the reliability of stress test results, aiding an understanding of their limitations, identifying areas where the stress testing approach should be improved and ensuring that the stress test results are being used in a way that is consistent with the framework's objectives. Such reviews should provide coverage of all aspects of the stress testing framework on a periodic basis and should be used to ensure that stress testing frameworks are maintained and regularly updated.

### *Additional points for banks:*

Challenge during a stress test exercise should occur at multiple points and at multiple levels within the bank. Reviews should include an independent validation of the key individual components of the stress testing process, such as review of the methodologies, assumptions of the scenario, and estimations of the stressed losses, revenues and liquidity forecasts. It is expected that this review would include an assessment of the overall adequacy of the exercise, eg back testing or other benchmark comparison, and an analysis of the sensitivity of the results to the assumptions.

Challenge from the business areas of the assumptions and the plausibility of outcomes relative to market experience benefits the interpretation of results and ensures the stress test is not a pure statistical or hypothetical exercise.

When bank-wide stress tests are used to inform strategic business decisions that may affect the financial health of the institution, the board of the bank or an appropriately senior level governance body should provide challenge to the processes, assumptions (eg scenarios and sensitivities), and outcomes of the stress test.

As with any critical management process at a bank, the independent audit function should regularly review the bank's stress testing framework and its implementation, both for internal stress testing exercises, and for the bank's role in any bank-run supervisory exercise. Such reviews should be comprehensive and provide feedback on areas of improvement for the bank.

### *Additional points for authorities:*

When authorities use the results of a stress test for purposes within their remit, there should be a challenge process to gain comfort in the assumptions driving the outcomes and the results themselves, and to duly consider model limitations and risk. This applies regardless of whether or not the stress test was conducted using bank estimates.

Authorities should regularly review banks' internal stress testing frameworks. Supervisors should examine the stress testing results as part of their review of the internal capital adequacy assessment process (ICAAP) and the liquidity risk management of banks. In particular, supervisors should consider whether the frameworks appropriately capture all material risks areas, and consider the results of forward-looking stress testing exercises as part of assessing the adequacy of the bank's capital and liquidity.

Authorities should also review other aspects of banks' stress tests, such as whether they conform to their stated objectives and the governance arrangements. Supervisors should require management to

address any material deficiencies that are identified in the stress testing framework, including cases where the results of stress tests are not adequately taken into consideration in the bank's decision-making process.

## 9. Stress testing practices and findings should be communicated within and across jurisdictions

Communication of stress testing activities across relevant internal and external stakeholders can have benefits for both banks and supervisors. Sharing of results can, where appropriate, provide important perspectives on risks that would not otherwise be available to an individual entity or authority.

Disclosure of results of stress tests, whether by banks or authorities, can help to improve market discipline and provide confidence in the resilience of the banking sector to identified stresses. Banks and authorities that choose to disclose stress test results should carefully consider ways to ensure that market participants understand data that is disclosed, including limitations and assumptions on which it is based. This will help to reduce the risk that market participants draw ill-informed conclusions about the resilience of banks with differing or negative results.

### *Additional points for banks:*

Banks should have processes to support regular communication and coordination between group-level stress testing functions and individual banking subsidiaries or other relevant legal entities (whether within or across a jurisdiction).

It is important that banking groups are able to aggregate and report stress test results across legal entities and they should seek to establish consistency of approaches and impacts across jurisdictions.

### *Additional points for authorities:*

Where appropriate, authorities should foster transparency in stress testing processes and results and establish processes to communicate and coordinate stress testing activities with other domestic authorities, such as supervisory authorities, the central bank, resolution authorities and, where relevant, market conduct regulators.

Constructive dialogue between authorities and with the banking industry can help provide deeper insights into industry-level vulnerabilities and help in the conduct of the exercise, improving the quality of final stress test results.

Communication across jurisdictions includes both the sharing of stress test results among home and host supervisors of internationally active banks, subject to applicable legal constraints, as well as the international coordination and collaboration of stress testing activities across jurisdictions where this is likely to yield useful synergies. The Basel Committee's *principles for effective supervisory colleges* (June 2014)<sup>7</sup> specifically encourage the sharing of stress testing information within supervisory colleges. More generally, authorities should also consider scope for greater cross-border collaboration on stress testing where feasible, such as through common scenarios and sharing of better practices.

<sup>7</sup> Available at [www.bis.org/publ/bcbs287.pdf](http://www.bis.org/publ/bcbs287.pdf)

## Annex 1: Comparison of current principles and proposed new principles

This annex sets out the current stress testing principles of the Basel Committee, which are contained within its May 2009 publication *Principles for sound stress testing practices and supervision* and compares them with proposed new principles set out in this consultative document. The current principles are set out in the box below, together with cross references that show where they are effectively contained within the proposed new higher-level principles.

### Principles for banks

#### Use of stress testing and integration in risk governance

1. Stress testing should form an integral part of the overall governance and risk management culture of the bank. Stress testing should be actionable, with the results from stress testing analyses impacting decision making at the appropriate management level, including strategic business decisions of the board and senior management. Board and senior management involvement in the stress testing programme is essential for its effective operation. (See *proposed principles 1, 2 and 3*).
2. A bank should operate a stress testing programme that promotes risk identification and control; provides a complementary risk perspective to other risk management tools; improves capital and liquidity management; and enhances internal and external communication. (See *proposed principle 3*).
3. Stress testing programmes should take account of views from across the organisation and should cover a range of perspectives and techniques. (See *proposed principles 1, 2, 7 and 8*).
4. A bank should have written policies and procedures governing the stress testing programme. The operation of the programme should be appropriately documented. (See *proposed principle 2*).
5. A bank should have a suitably robust infrastructure in place, which is sufficiently flexible to accommodate different and possibly changing stress tests at an appropriate level of granularity. (See *proposed principles 5 and 6*).
6. A bank should regularly maintain and update its stress testing framework. The effectiveness of the stress testing programme, as well as the robustness of major individual components, should be assessed regularly and independently. (See *proposed principle 8*).

#### Stress testing methodology and scenario selection

7. Stress tests should cover a range of risks and business areas, including at the firm-wide level. A bank should be able to integrate effectively, in a meaningful fashion, across the range of its stress testing activities to deliver a complete picture of firm-wide risk. (See *proposed principles 3 and 4*).
8. Stress testing programmes should cover a range of scenarios, including forward-looking scenarios, and aim to take into account system-wide interactions and feedback effects. (See *proposed principle 4*).
9. Stress tests should feature a range of severities, including events capable of generating the most damage whether through size of loss or through loss of reputation. A stress testing programme should also determine what scenarios could challenge the viability of the bank (reverse stress tests) and thereby uncover hidden risks and interactions among risks. (See *proposed principle 4*).

10. As part of an overall stress testing programme, a bank should aim to take account of simultaneous pressures in funding and asset markets, and the impact of a reduction in market liquidity on exposure valuation. *(See proposed principles 4 and 7).*

#### Specific areas of focus

11. The effectiveness of risk mitigation techniques should be systematically challenged. *(See proposed principles 7 and 8).*
12. The stress testing programme should explicitly cover complex and bespoke products such as securitised exposures. Stress tests for securitised assets should consider the underlying assets, their exposure to systematic market factors, relevant contractual arrangements and embedded triggers, and the impact of leverage, particularly as it relates to the subordination level in the issue structure. *(See proposed principles 4 and 7).*
13. The stress testing programme should cover pipeline and warehousing risks. A bank should include such exposures in its stress tests regardless of their probability of being securitised. *(See proposed principles 4 and 7).*
14. A bank should enhance its stress testing methodologies to capture the effect of reputational risk. The bank should integrate risks arising from off-balance sheet vehicles and other related entities in its stress testing programme. *(See proposed principles 4 and 7).*
15. A bank should enhance its stress testing approaches for highly leveraged counterparties in considering its vulnerability to specific asset categories or market movements and in assessing potential wrong-way risk related to risk mitigating techniques. *(See proposed principles 4 and 7).*

#### Principles for supervisors

16. Supervisors should make regular and comprehensive assessments of a bank's stress testing programme. *(See proposed principle 8).*
17. Supervisors should require management to take corrective action if material deficiencies in the stress testing programme are identified or if the results of stress tests are not adequately taken into consideration in the decision-making process. *(See proposed principle 8).*
18. Supervisors should assess and if necessary challenge the scope and severity of firm-wide scenarios. Supervisors may ask banks to perform sensitivity analysis with respect to specific portfolios or parameters, use specific scenarios or to evaluate scenarios under which their viability is threatened (reverse stress testing scenarios). *(See proposed principles 4 and 8).*
19. Under Pillar 2 (supervisory review process) of the Basel II framework, supervisors should examine a bank's stress testing results as part of a supervisory review of both the bank's internal capital assessment and its liquidity risk management. In particular, supervisors should consider the results of forward-looking stress testing for assessing the adequacy of capital and liquidity. *(See proposed principles 3 and 8).*
20. Supervisors should consider implementing stress test exercises based on common scenarios. *(See proposed principle 4).*
21. Supervisors should engage in a constructive dialogue with other public authorities and the industry to identify systemic vulnerabilities. Supervisors should also ensure that they have the capacity and skills to assess a bank's stress testing programme. *(See proposed principles 5 and 9).*



## Comparison of current principles and proposed new principles

The Committee proposes in this consultative document to replace the current stress testing principles with a new set of principles that are more streamlined and stated at a higher level. The intention is to establish a set of principles that is more enduring in the face the diverse range of stress testing practices and their continued evolution. The following can be observed when comparing the two sets of principles:

- *Application of all principles to banks and authorities.* The current principles are separated into those principles that apply to banks and those that apply to authorities. Regarding the latter, these mostly focused on the supervisory review of banks' internal stress tests. This reflects the fact that when the current principles were developed, supervisory stress testing was in its infancy. Given that supervisory stress testing has undergone significant development in recent years and is now established as a core supervisory tool, the proposed new principles apply to both banks and authorities.
- *Consolidation of principles.* The proposed new principles consolidate many of the old principles into the new higher-level principles. For example, many of the current principles either address directly or touch upon the issues of risk capture and stress test severity (see current principles 8, 9, 10, 12, 13, 14, 18 and 20). These issues are now captured in the proposed new principle 4 that states: "[s]tress testing frameworks should capture material and relevant risks and apply stresses that are sufficiently severe".
- *Reduction in detail.* Some elements of the current stress testing principles are detailed and may not be applicable to all banks. For example, the current principle 13 requires stress testing programmes to cover pipeline and warehousing risks. Although these are still relevant risks for many banks, they are a subset of the more general principle of adequate risk capture (see proposed new principle 4). Therefore, where possible, the Committee has tried to exclude from the principles, and the accompanying text, specific issues of detail in favour of more generally applicable concepts.