



GARP Risk Institute

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Bank for International Settlements
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GARP Risk Institute (GRI) response to BCBS consultation on Stress Testing Principles

The GARP Risk Institute (GRI)¹ welcomes the chance to provide feedback to the Basel Committee on Banking Supervision's Consultative Document, 'Stress testing principles' (December 2017).² Our response is divided into three sections:

1. Summary
2. Opportunities to improve the current approach to regulatory stress testing
3. Next steps

1. Summary

Overall, the revised Stress Testing Principles are welcome. While more streamlined and generic than the original ones, the updated principles are sensible and comprehensive, offering a guide to both banks and authorities on how to implement stress testing regimes that add meaningfully to risk management.

In terms of the principles themselves, GRI has the following specific observations:

- **Principle 3 / the use test.** Stress testing should be a key part of banks' risk management, which means it needs to be undertaken regularly. This is important, but we have two further observations.

¹ The GARP Risk Institute is a newly established division of the Global Association of Risk Professionals (GARP), <http://www.garp.org>. GARP is a not-for-profit global membership organization dedicated to preparing professionals and organizations to make better-informed risk decisions. The GARP community represents risk management practitioners and researchers from banks, investment management firms, government agencies, academic institutions and corporations from more than 195 countries. GARP's mission 'To be the leading professional association for risk managers dedicated to the advancement of the risk profession through education, research and the promotion of best practices globally'. The association administers the Financial Risk Manager (FRM®) and Energy Risk Professional (ERP®) exams; certifications recognized and valued by risk professionals worldwide. GARP does not engage in consulting or lobbying activities.

² This response has been discussed with the following firms: Barclays plc, HSBC Holdings plc, Lloyds Banking Group plc, Nationwide Building Society, The Royal Bank of Scotland plc, Santander UK Group Holdings plc and Standard Chartered plc.



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- First, given the vast range of stress tests that banks currently undertake (see Annex 1 for a UK perspective), it would be helpful if authorities could give more consideration to what ‘regularly’ means in practice and which stress tests they are referring to. For example, an ad hoc stress test on a specific business line is a very different undertaking to a regulatory driven enterprise-wide stress test. It would be helpful if authorities could recognise and consider the range of stress tests more explicitly and clearly set out their expectations of breadth/depth/range of stress tests that they expect firms to undertake. Authorities might also consider developing a ‘hierarchy’ of stress tests that help to clarify their expectations.
- Second, given the growth in the number of supervisory stress tests across the globe, and the risks that they ‘crowd out’ internal stress tests, it would be good to include a recommendation that authorities review the balance between regulatory-led stress testing and internal stress testing for banks for which they are the consolidated supervisor. This would help to ensure that the balance is appropriate.
- **Principle 4 / Risk identification.** It would be helpful to make it clear that stress tests should explicitly consider non-financial and operational risks.
- **Principle 5 / Adequacy of resourcing.** While ensuring the adequacy of stress testing resourcing is important, this principle should incorporate explicit consideration of the balance of costs and benefits of the stress tests required. When considering the benefits, authorities need to be clear about the purpose of any regulatory stress tests and ensure that the test design is suitable for its stated purpose. For example, stress tests that are for explicitly macroprudential purposes will not necessarily require the same granularity of data that microprudential stress tests need.
- **Principle 6 / Data granularity.** It would be helpful to focus on data quality and a level of optimal data granularity, which is not the same as simply the volume of data. GRI has these further observations:
 - Deep risk management insights from stress tests can be obtained from lower volumes of higher quality data.
 - The Principles state that ‘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.’ Stress testing, by its very nature, involves projections that are highly uncertain and involve judgement. Thus, references to ‘accuracy’ are only sensible in the context of historical data, and it would be helpful to be clear about this. In the context of projections, particularly those made over many years, authorities should be wary of requiring overly granular projections; arguably these raise the risk of



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being ‘precisely wrong’ rather than ‘roughly right’. It would therefore be helpful if data granularity required for regulatory stress test projections were set with consideration to the materiality of the risks, the time horizon of the projections required, and the costs and benefits involved.

- It would be helpful if there was a mechanism for engagement between authorities and banks on the appropriate level of materiality for each regulatory stress test. This engagement mechanism might be best articulated in a Code of Practice, an idea which is elaborated in section 3 of this response. When granular insights are required on particular risks, other formats might be more appropriate – such as asset quality reviews.
- **Principle 9/ International communication.** GRI strongly endorses this principle and urges the regulatory community to work with practitioners to help begin the process of streamlining stress testing approaches, where appropriate, to improve the comparability of results shared across jurisdictions. Driving greater harmonisation of data definitions and standards across stress tests would likely reduce costs, improve quality and allow greater sharing of results.

These suggested changes are, overall, relatively minor. GRI supports both the spirit and intent of the principles.

Our concern is less with the *substance* of the principles, than with their *achievability*. We are also concerned about the rapid growth in the range of stress testing practices across the regulatory community. This is resource intensive for both banks and supervisors; it is also likely to encourage a ‘compliance’ mindset in banks and makes it difficult for supervisors to use results across jurisdictions to provide a holistic view of the risk of an institution. Our comments in the next section focus on:

- highlighting the problems with the current fragmentation of approaches across the globe;
- suggesting areas for future research and collaborative efforts across banks and supervisors.

GRI welcomes the opportunity to work objectively and constructively with supervisors and practitioners to look at ways to harmonise approaches, with the aim of improving the comparability of stress tests and helping to improve the analytical insights for authorities while reducing the resource burden for both banks and supervisors.³

³ See also GARP’s response to the IOSCO Consultative Report ‘Framework for supervisory stress testing for central counterparties (CCPS)’ available at: <https://www.bis.org/cpmi/publ/comments/d161/garp.pdf>.



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2. Opportunities to improve current approach to regulatory stress testing

The Basel Committee's 2009 stress testing principles highlighted serious deficiencies in banks' stress testing practices in the run up to the financial crisis. Since then, many regulators across the globe have developed stress testing regimes, as highlighted in the companion Basel paper, 'Supervisory and bank stress testing: range of practices'⁴ (henceforth 'Range of Practices').

Banks are now required to perform many different regulatory stress tests, including: capital and liquidity stress tests as part of ICAAP and ILAAP, stress tests as part of managing interest rate risk in the banking book, stress tests as part of recovery and resolution planning, reverse stress tests, and Pillar 1 market risk stress tests. Annex 1 provides a summary grid for UK bank stress testing as an example of the range of test required.

There are also several 'concurrent' stress testing regimes across the globe, where groups of banks will be required to run the same scenario(s) at the same time. Banks that operate across many jurisdictions often face multiple stress tests from different regulators, which are mainly uncoordinated and will likely be based on different methodologies, assumptions and approaches. Annex 2 provides a few headline differences across some of the major concurrent stress testing regimes.

More recently, there has been increasing focus on the potential for using stress testing as a macroprudential tool, focussing on the feedback loops and amplification mechanisms across firms and sectors.⁵ Further, banks also need to run stress tests as part of their everyday risk management - as is enshrined in the Basel principles.

This proliferation in the range of uses of stress testing is testament to their potential power. But it comes at a cost, both for banks and for supervisors.⁶ Estimates of the costs are hard to establish with any precision. One recent KPMG study, for example, found that very few firms formally monitored stress testing costs.⁷ The estimates made in the study point to several billion dollars a year.

⁴ <https://www.bis.org/bcbs/publ/d427.pdf>.

⁵ For example, see Bank of England (2017), 'Financial Stability Paper No. 42 - July 2017 Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment fund' available at: <https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-paper/2017/simulating-stress-across-the-financial-system-resilience-of-corporate-bond-markets.pdf?la=en&hash=C28EF509958C424DE474CADE1BBC137A7D4C0523>.

⁶ The Range of Practices paper, for example, notes the resourcing challenges: 'Nearly all authorities consider obtaining adequate resources to be one of the greatest challenges in implementing a supervisory stress testing framework.' It also states that: 'Personnel and technical resources are seen by many authorities as the most important drivers to ensure a successful supervisory stress testing process.'

⁷ KPMG surveyed 19 Global Systemically Important Banks (G-SIBs) and Domestic Systemically Important Banks (D-SIBs), asking them about their average annual stress testing budget across 2012 - 2015 (in \$US). Responses ranged from 6% of banks with costs \$251m - \$500m; 19% of respondents' costs ranged between \$101m - \$250m



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In addition to the cost estimates, the study also found that only 30% of these firms used external stress testing to support business planning. The banks surveyed cited the divergent approaches and frequent or late changes to methodologies as barriers to the effective completion of stress test exercises and the ability to leverage internal and external methodologies. Given limited resources in banks and supervisors, one priority should be to establish cost benchmarks (see 3.b below). These would then help frame discussions around how changes could help reduce costs, while maintaining quality.

But even where there are sufficient resources, the growth of disparate regulatory tests raises many challenges, which are compounded to the extent that regulatory requests frequently change or are set with short deadlines. For example:

1. Meeting disparate requirements makes it harder to achieve economies of scale in the production of stress test outputs. It also increases the likelihood that stress testing becomes a compliance exercise, as staff involved flip from one test to another without necessarily having sufficient time to contemplate the results in a meaningful way. Indeed, the Range of Practices paper indicates that stress testing is regarded as a compliance exercise for around a fifth of institutions surveyed.
2. The greater the number of distinct regulatory stress tests that are required, the higher the risk of 'crowding out' of stress tests that are run as part of banks' day-to-day risk management.
3. Frequently changing regulatory requirements, often set with short deadlines, discouraging them from investing in robust, strategic IT architecture that can provide greater accuracy and faster responsiveness to regulatory requests.
4. Regulatory stress tests run in different jurisdictions have not been designed with comparability in mind. That makes it more difficult for both analysts and regulators to compare results of these varying stress tests.

Greater coordination and alignment of stress tests across regulators would increase the likelihood of the banks being able to meet the Basel principles. It would also likely strengthen the supervision of globally significant firms and make the stress tests more able to provide macroprudential insights. As such, we believe it is positive that the Range of Practices paper both recognises the challenges and actively supports the idea of greater coordination of stress testing activities across jurisdictions and greater sharing of information between supervisors.⁸

and 75% of respondents' costs fell in the range 0 - \$100m. Only 10% formally monitored costs; 50% guessed them - in part because the definition of what counts as 'stress testing' is not clear. See 'Stress Testing: A benchmark analysis of systemically important financial institutions', available at: <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2016/11/stress-testing-a-benchmarking-analysis-of-systemically-important-financial-institutions.pdf>.

⁸ 'Key challenges that remain for banks include finding and maintaining sufficient resources to run stress testing frameworks, and improving data quality, data granularity and the systems needed to efficiently aggregate data



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The key to driving greater alignment is to focus on areas where commonality would help improve comparability, increase efficiency and help information sharing. Greater comparability might come in the form of methodology, data definitions, templates, underlying data models or method of execution. Greater sharing might alleviate the need for some supervisors to undertake their own independent tests – saving time and resources for both the supervisors and the banks, without compromising the quality of supervision. And by reducing the range of approaches, it would help banks build a sustainable data and IT architecture that would be accurate and quickly responsive to supervisors’ requirements, thus alleviating some of the pressures noted above.

Challenges to harmonization: One potential challenge with trying to drive greater harmonisation is that the tests themselves serve different purposes. The most obvious distinction is between the traditional microprudential focus and the increasing use of stress tests for macroprudential policy purposes. There is a legitimate question whether a stress test for macroprudential policy purposes should be designed differently, perhaps with a lower level of granularity but with more emphasis on how shocks to the financial sector are transmitted between firms, across sectors and geographies. For example, would macroprudential policy makers be better served by more scenarios being run by banks and other players in the financial system but with less emphasis on the precision and detail being asked for by microprudential supervisors? Do the constraints within many microprudential tests – such as static balance sheets or predefined lending paths – make sense at a macroprudential level? We believe that further work should be done to assess the optimal design of macroprudential stress tests with constructive and meaningful input from supervisors and practitioners, although recognizing that ultimately the finalised stress test sits within the final province of the regulatory community.

3. Next Steps

GRI would like to work with practitioners and the regulatory community to help promote greater comparability across stress tests. There are a range of ways that stress testing across regulators could collectively be organised to promote coordination.

a) Develop a Code of Practice

As an initial step we suggest developing a Code of Practice for Supervisory Stress Tests, following the approach commonly used in statistical data collections.⁹ This could establish

from across the banking group for use in stress tests. For national authorities, greater coordination of stress testing activities across authorities is needed, eg via the exchange information on stress test plans and results through supervisory colleges.’

⁹ For example, see UK Office for Statistics Code at <https://www.statisticsauthority.gov.uk/osr/code-of-practice/>; the Eurostat code available at <http://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-32-11-955>; the Bank of England code: <https://www.bankofengland.co.uk/-/media/boe/files/statistics/statistical-code-of-practice.pdf?la=en&hash=A692E77FCD588E37EC2BB88EA2B2F4A1C96C5120>



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greater harmonisation of standards for how regulators should set out stress testing requirements and timelines.¹⁰ Standards would cover areas such as:

- Minimum standards for consultation with participating banks on templates.
- Standards on the timetable of releasing stress testing instructions to allow sufficient time for production, analysis and review and challenge/governance.
- Standards to help promote timely and efficient regulatory feedback on issues/questions raised by banks.
- Standards on the need for supervisors to coordinate to create a global calendar of regulatory stress tests

b) Develop cost metrics and examine the scope for rationalisation/harmonisation.

We believe it would be helpful to establish cost metrics, which can help provide a way of measuring the impact of any subsequent changes. Ideas include:

- Develop metrics of cost burden to help baseline the resources committed to this activity.
- Develop metrics on volumes of data and documentation required.
- Survey participants on the value added.
- Examine the extent to which banks use stress testing for their own internal risk management purposes and how tests for internal use differ from supervisory stress tests.
- Survey banks on what changes to stress tests might help improve their usefulness for risk management.
- Examine the case for developing data quality metrics to be monitored over time as this is one key area that banks (and supervisors) want to see improved.¹¹
- Benchmark stress tests across jurisdictions and examine the areas for potential harmonisation.

c) Support research on the design of micro and macroprudential stress tests

- Support research on the appropriate design of micro and macro prudential stress tests.

¹⁰ See also Paisley, J. (2017), 'Stress testing: where next?' Vol. 10, Journal of Risk Management in Financial Institutions.

¹¹ For example, as stated in the Range of Practices paper: 'There are two key areas that institutions are commonly looking to improve. The first is the focus on integrating stress testing into business as usual processes. Institutions openly discuss the need to derive business benefits given the resources devoted to the process. Second, institutions are still looking to improve data quality and availability through additional investment. This is consistent with supervisory findings around risk data architecture and IT infrastructure and also observations from numerous external stakeholders.'



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- Examine current approaches across jurisdictions and survey participants and authorities on the extent to which the current designs are appropriate for their stated purposes.

GRI is willing to meet and work with the global regulatory community to convey and leverage its experience in conducting regulatory studies over the past six years.

Yours truly

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Annex 1: Range of stress testing in the UK

	Concurrent stress test	ICAAP internal stress test	Reverse stress testing	Recovery planning	ILAAP Liquidity stress test	Interest rate risk in the banking book (IRRBB)	VaR/SVaR	BAU stress testing for risk management
Focus	Capital adequacy	Capital adequacy	Exploring point at which the firm's business model becomes unviable	Credibility of recovery options in range of scenarios	Focused on liquidity and funding risks	Focused on interest rate risk in the banking book	Potential losses in trading book	Ad hoc by portfolio, business line or legal entity
Policy use	Macro and Microprudential	Microprudential	Microprudential	Microprudential	Microprudential	Microprudential	Microprudential	n/a
Coverage	Enterprise wide, covers all risk types, banking book and trading book	Enterprise wide, covers all risk types, banking book and trading book	Enterprise wide, covering all risks	Enterprise wide, covering all risks	Covers entire balance sheet, legal entity focus	Banking book	Trading book	Focused on risks of interest (eg wholesale credit, mortgage books, a particular subsidiary)
Institutions	Only covers largest banks	All banks	All banks	All banks	All banks	All banks	All banks	All banks
Scenario(s)	Provided by the regulator	Scenario designed by the institution to capture relevant risks. Severity often suggested by the regulator.	Scenarios should be designed that render the business model unviable, which is the point when crystallising risks cause the market to lose confidence in the firm.	A range of scenarios of severe macroeconomic and financial stress relevant to the firm's specific conditions including system-wide events and idiosyncratic stress scenarios.	Stress scenarios should be selected to reveal the vulnerabilities of the firm's funding, including for example, a vulnerability to previously liquid markets becoming unexpectedly illiquid.	A range, including: - Internal interest rate shock scenarios addressing the bank's risk profile (ICAAP); - historical and hypothetical interest rate stress scenarios; - six prescribed interest rate shock scenarios ¹² - any additional interest rate shock scenarios required by supervisors.	(S)VaR measures of the \$ amount of potential loss at a specified confidence level from (significantly stressed) adverse market movements in an ordinary market environment.	Scenarios generated in house - could be global, regional, focus, or operational trading book or banking book
Disclosure	Results often disclosed publicly by the regulator	Not public. To be included in the ICAAP	Not public. To be included in the ICAAP	Not public.	Not public.	Banks must disclose: the impact of interest rate shocks on change in economic value of equity (Δ EVE) and change in net interest income (Δ NI), computed based on a set of prescribed interest rate shock scenarios.	Pillar III ¹³ VaR estimates vs actual gains/losses, analysis of outliers in backtest results.	No prescription

¹² See Basel Committee on Banking Supervision Standards (2016), 'Interest rate risk in the banking book', <https://www.bis.org/bcbs/publ/d368.pdf>

¹³ See Basel Committee on Banking Supervision Standards (2017), 'Pillar 3 disclosure requirements - consolidated and enhanced framework', <https://www.bis.org/bcbs/publ/d400.pdf>

Annex 2: Some key difference across concurrent stress testing regimes

	Bank of England	EBA	CCAR	HKMA
Capital Hurdle Rate	<p>Single risk-weighted common equity Tier 1 (CET1) ratio hurdle rate and a single Tier 1 leverage ratio hurdle rate that incorporate their minimum capital requirement and any buffers to reflect their systemic importance.</p> <p><i>Note: See Bank of England (2018) for a detailed overview of most recent changes to hurdle rates.¹⁴</i></p>	<p>No hurdle rate.</p> <p>Competent authorities apply stress test results as an input to the Supervisory Review and Evaluation Process (SREP) in line with EBA Guidelines for the SREP</p>	<p>Common equity tier 1 ratio: 4.5%; Tier 1 risk based capital ratio: 6.0%; Total risk based capital ratio: 8%; Tier 1 leverage ratio: 4%; For advanced approaches firms, supplementary leverage ratio: 3%</p>	<p>As per HKMA Banking Capital Rules, banks are required to meet the regulatory minima (Pillar 1 regulatory minimum plus Pillar 2 capital add-on).</p> <p>Hurdle rates are treated as highly restricted information</p> <p>Hurdle rate plus phased in Domestic Systemically Important Institutions (D-SII) buffer (2.5% by 2019 and phased in starting at 0.625% in 2016)</p>
Deliverables	<p>Detailed granular results in PRA-specified format Prescriptive unstructured data documentation requirements</p>	<p>Detailed granular results in EBA-specified format Prescriptive documentation requirements (no explicit requirements for documentation in 2014)</p>	<p>Detailed granular results in FRB - specified format (FRY-14A schedules) Capital Plan and detailed supporting documentation</p>	<p>Detailed granular results in HKMA specified format Non-prescriptive unstructured data documentation requirements</p>
Focus and assumptions	<p>Global macroeconomic scenario</p> <p>Dynamic balance sheet with some BoE prescribed constraints, eg. UK lending</p> <p>OpR – introduced stressed misconduct costs in 2015. In 2016 additional misconduct costs not required under base projections beyond provisions included in T-zero.</p>	<p>Global with European focus</p> <p>Static balance sheet with multiple EBA mandated constraints</p> <p>OpR – based on PRA 2015 methodology. Misconduct costs required in base projections, but at a lower level of severity.</p>	<p>Global recession with U.S. focus. Heightened stress in corporate loan and CRE markets</p> <p>Dynamic balance sheet – assumes banks remain willing to lend</p> <p>OpR – FRB uses a regression model to forecast industry level OpR losses and then allocate to firms based on asset size</p>	<p>Global Macroeconomic scenario</p> <p>Static balance sheet</p> <p>No Operational Risk requirements</p>

PRA: Prudential Regulation Authority; FRB: Federal Reserve Board, CCAR: Comprehensive Capital Analysis and Review; HKMA Hong Kong Monetary Authority.
 CET 1: Common Equity Tier 1
 OpR: Operational Risk; T-zero: starting point for the stress test; CRE: Commercial real estate

¹⁴ Bank of England (2018) 'Stress testing the UK banking system: key elements of the 2018 stress test', available at <https://www.bankofengland.co.uk/-/media/boe/files/stress-testing/2018/stress-testing-the-uk-banking-system-key-elements-of-the-2018-stress-test.pdf?la=en&hash=6A00F3E28248411FF638A2E55B6060B2FBB882A1>.