McKinsey&Company

McKinsey Working Papers on Risk, Number 55

Introducing a holistic approach to stress testing

Christopher Mazingo
Theodore Pepanides
Aleksander Petrov
Gerhard Schröck

June 2014

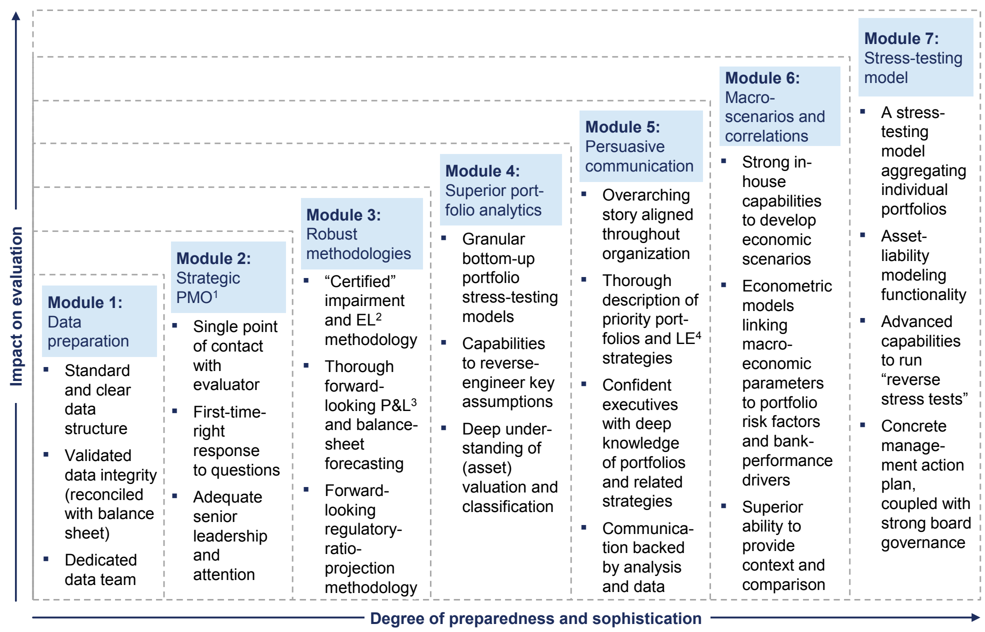
Introducing a holistic approach to stress testing

In the beginning, stress tests were ad hoc initiatives launched by national regulators to assess the current state of their domestic banking industry in the aftermath of severe external shocks. Increasingly, however, they are becoming regular features of the ongoing regulatory process. While initial stress-testing exercises mainly focused on capital adequacy, looking in particular at capital ratios, more recent tests have placed greater emphasis on qualitative and quantitative modules to evaluate broader risks within banks. Stress testing has now become one of the regulators' main tools for regularly assessing the health of supervised banks. Banks operating internationally (for example, non-US-owned banks with major US operations) will face multiple and more comprehensive stress-testing requirements to satisfy both home country and host country requirements.

Stress tests are cost-intensive endeavors. They demand a large number of dedicated employees and the active involvement across virtually the entire organization—risk, finance, treasury, business units, audit, senior management, and the board of directors. Additionally, a failure to comply with a regulator's requirements could result in severe penalties, for example, a mandatory recapitalization, forced sale of operating units and portfolios, and management changes. It has therefore become a key priority for banks to develop an effective and cost-efficient approach to stress testing.

For the original round of tests, there was a necessary focus on data collection and mechanisms to allow an unfiltered transfer of information to relevant evaluators. However, the latest rounds of testing focus much more significantly on the quality of banks' internal risk management and capital planning processes—it has become increasingly important that banks are able to demonstrate to supervisors the quality and robustness of their internal capabilities in capital planning and stress-testing analysis. Banks can benefit from taking a more proactive approach, for instance, by developing extensive commentary on their analyses and frequently communicating with regulators. Like other regulatory requirements, a stress test is essentially a process, and

Exhibit Seven steps can help banks develop better stress tests.



1 Project-management office.
2 Estimated loss.
3 Profit and loss.
4 Loss estimation.

it can be made more efficient with regard to time and costs, particularly if banks realize the need for a clearly articulated and internally aligned story line. This working paper sets out a seven-module process, starting with thorough data preparation and extending to a clear communication strategy and comprehensive modeling of macroscenarios (exhibit).

Module 1: Data preparation
The starting point of each stress-testing exercise is the preparation of data tapes. For this step, it is essential to provide the evaluator with a comprehensive and easy-to-navigate data set augmented by an authoritative commentary that seeks to explain and interpret the data. Also, it is vital to ensure integrity between reporting and accounting data sets. For these purposes, banks can benefit from the creation of a dedicated data team responsible for data aggregation as well as for responding in a timely fashion, often under severe pressure, to evaluators' requests.

Module 2: Strategic project-management office (PMO)
In some banks, stress testing is seen more as an operational than a strategic task, and consequently it receives relatively little—or even no—top-management attention and buy-in. This can be overcome if a bank establishes a strategic PMO. The PMO serves as single point of contact for the evaluator. It ensures the consistency and alignment of all data submissions and communication. In addition, it is responsible for the active steering of the entire stress-testing process and can significantly raise the likelihood of effective internal governance. Ideally, the PMO consists of top managers from every relevant business function and is headed by a leader one level below the CEO in the organization. Top-management involvement serves to highlight the importance of the exercise to both internal and external stakeholders.

Module 3: Robust methodologies
Data models are at the core of each stress test. The creation of viable scenarios and the correct assessment of their implications for the bank are essential. Often, the applied models neglect second-order effects, external shocks, and other significant risk factors. In addition, many models are not robust with respect to the scenarios' effect on business volumes, revenues, and costs. Banks therefore need to initiate a forward-looking projection of financial statements and their underlying drivers. They should also develop comprehensive stress-testing manuals, including guidelines, standard processes, and best practices.

Module 4: Superior portfolio analytics
Regulators are increasingly focusing their evaluation on selected asset classes and portfolio types. In order to forecast the behavior of specific portfolios under stress, banks need to establish granular bottom-up stress-testing models on a portfolio level, incorporating all risk types (for instance, credit, market, operational, and liquidity risk). Only then can they assess the impact of various scenarios on their financial statements and ratios. To make this convincing and compelling to the evaluators, banks need a deep understanding of their applied methodologies so that their explanatory materials meet the necessary standard.

Module 5: Persuasive communication
Both internal and external communications are essential for an efficient stress-testing exercise. Banks therefore need a clear communication strategy. An overarching story line not only helps to set the frame for future analyses internally but also provides context for the regulator's evaluation. Follow-up communication with regulators should be precise, consistent, and fact based, which can help avoid uncertainties as well as misunderstandings. It is vital that the bank representatives who present findings to regulators are as well prepared as possible because an overly conservative assessment of the bank would have serious disadvantages.

Module 6: Macroscenarios and correlations
Banks often apply a "black hole" approach to developing stress-testing models. Their econometric models fail to link macroeconomic factors and core banking drivers and usually are not based on historical data. In

many cases, banks also fail to provide any explanation as to how core drivers of their performance might be counterintuitively sensitive to macroscenarios. This could raise concerns on the part of the evaluator and lead to a conservative assessment. It is therefore advisable to build strong in-house capabilities for scenario development and analysis. Additionally, banks should place high emphasis on developing sophisticated stress-testing models that consider a wide range of macrotrends.

Module 7: Stress-testing model
It is important that stress tests are not seen as simply necessary and costly elements of a bank's compliance with regulatory requirements. Provided they are of sufficient quality, the data and analyses required to fulfill a test can serve as a strong base for strategic decisions. Banks should create central risk-aggregator models designed to combine individual portfolio results from business lines and incorporate forward-planning assumptions. Banks also need to develop capabilities for reverse stress testing, allowing them to assess the impact of potential strategic actions on key ratios and financial statements. Finally, they need to ensure that stress tests are followed by concrete action plans with full account taken of governance, processes, and responsibilities.

Stress testing can be a painful and resource-consuming process for banks. Because the potential penalties from a poor assessment are so severe, there is little room for inefficiencies or, worse, actual mistakes. Given the recent announcement of multiple stress-testing initiatives, we can be confident that this will remain the case for most banks that operate internationally. Due to tight deadlines and increasingly detailed regulatory requests, the bare submission of unexplained data is no longer feasible. An efficient approach to stress testing must involve a comprehensive and annotated data tape, outstanding modeling capabilities, stringent process management, and clear-cut internal and external communications. The seven-step process introduced in this paper suggests that the real aspiration for senior managers should be to use a mandatory and apparently long-lasting regulatory requirement to trigger improvements in how they make strategic decisions.

Christopher Mazingo is a principal in McKinsey's New York office, **Theodore Pepanides** is a principal in the Athens office, **Aleksander Petrov** is a principal in the Milan office, and **Gerhard Schröck** is a principal in the Frankfurt office.

Contact for distribution: Francine Martin
Phone: +1 (514) 939-6940
E-mail: Francine_Martin@mckinsey.com

McKinsey Working Papers on Risk

1. **The risk revolution**
   Kevin Buehler, Andrew Freeman, and Ron Hulme
2. **Making risk management a value-added function in the boardroom**
   André Brodeur and Gunnar Pritsch
3. **Incorporating risk and flexibility in manufacturing footprint decisions**
   Eric Lamarre, Martin Pergler, and Gregory Vainberg
4. **Liquidity: Managing an undervalued resource in banking after the crisis of 2007–08**
   Alberto Alvarez, Claudio Fabiani, Andrew Freeman, Matthias Hauser, Thomas Poppensieker, and Anthony Santomero
5. **Turning risk management into a true competitive advantage: Lessons from the recent crisis**
   Andrew Freeman, Gunnar Pritsch, and Uwe Stegemann
6. **Probabilistic modeling as an exploratory decision-making tool**
   Andrew Freeman and Martin Pergler
7. **Option games: Filling the hole in the valuation toolkit for strategic investment**
   Nelson Ferreira, Jayanti Kar, and Lenos Trigeorgis
8. **Shaping strategy in a highly uncertain macroeconomic environment**
   Natalie Davis, Stephan Görner, and Ezra Greenberg
9. **Upgrading your risk assessment for uncertain times**
   Eric Lamarre and Martin Pergler
10. **Responding to the variable annuity crisis**
    Dinesh Chopra, Onur Erzan, Guillaume de Gantes, Leo Grepin, and Chad Slawner
11. **Best practices for estimating credit economic capital**
    Tobias Baer, Venkata Krishna Kishore, and Akbar N. Sheriff
12. **Bad banks: Finding the right exit from the financial crisis**
    Gabriel Brennan, Martin Fest, Matthias Heuser, Luca Martini, Thomas Poppensieker, Sebastian Schneider, Uwe Stegemann, and Eckart Windhagen
13. **Developing a postcrisis funding strategy for banks**
    Arno Gerken, Matthias Heuser, and Thomas Kuhnt
14. **The National Credit Bureau: A key enabler of financial infrastructure and lending in developing economies**
    Tobias Baer, Massimo Carassinu, Andrea Del Miglio, Claudio Fabiani, and Edoardo Ginevra
15. **Capital ratios and financial distress: Lessons from the crisis**
    Kevin Buehler, Christopher Mazingo, and Hamid Samandari
16. **Taking control of organizational risk culture**
    Eric Lamarre, Cindy Levy, and James Twining
17. **After black swans and red ink: How institutional investors can rethink risk management**
    Leo Grepin, Jonathan Tétrault, and Greg Vainberg
18. **A board perspective on enterprise risk management**
    André Brodeur, Kevin Buehler, Michael Patsalos-Fox, and Martin Pergler
19. **Variable annuities in Europe after the crisis: Blockbuster or niche product?**
    Lukas Junker and Sirus Ramezani
20. **Getting to grips with counterparty risk**
    Nils Beier, Holger Harreis, Thomas Poppensieker, Dirk Sojka, and Mario Thaten

McKinsey Working Papers on Risk

21. **Credit underwriting after the crisis**
Daniel Becker, Holger Harreis, Stefano E. Manzonetto, Marco Piccitto, and Michal Skalsky

22. **Top-down ERM: A pragmatic approach to manage risk from the C-suite**
André Brodeur and Martin Pergler

23. **Getting risk ownership right**
Arno Gerken, Nils Hoffmann, Andreas Kremer, Uwe Stegemann, and Gabriele Vigo

24. **The use of economic capital in performance management for banks: A perspective**
Tobias Baer, Amit Mehta, and Hamid Samandari

25. **Assessing and addressing the implications of new financial regulations for the US banking industry**
Del Anderson, Kevin Buehler, Rob Ceske, Benjamin Ellis, Hamid Samandari, and Greg Wilson

26. **Basel III and European banking: Its impact, how banks might respond, and the challenges of implementation**
Philipp Härle, Erik Lüders, Theo Pepanides, Sonja Pfetsch, Thomas Poppensieker, and Uwe Stegemann

27. **Mastering ICAAP: Achieving excellence in the new world of scarce capital**
Sonja Pfetsch, Thomas Poppensieker, Sebastian Schneider, and Diana Serova

28. **Strengthening risk management in the US public sector**
Stephan Braig, Biniam Gebre, and Andrew Sellgren

29. **Day of reckoning? New regulation and its impact on capital markets businesses**
Markus Böhme, Daniele Chiarella, Philipp Härle, Max Neukirchen, Thomas Poppensieker, and Anke Raufuss

30. **New credit-risk models for the unbanked**
Tobias Baer, Tony Goland, and Robert Schiff

31. **Good riddance: Excellence in managing wind-down portfolios**
Sameer Aggarwal, Keiichi Aritomo, Gabriel Brenna, Joyce Clark, Frank Guse, and Philipp Härle

32. **Managing market risk: Today and tomorrow**
Amit Mehta, Max Neukirchen, Sonja Pfetsch, and Thomas Poppensieker

33. **Compliance and Control 2.0: Unlocking potential through compliance and quality-control activities**
Stephane Alberth, Bernhard Babel, Daniel Becker, Georg Kaltenbrunner, Thomas Poppensieker, Sebastian Schneider, and Uwe Stegemann

34. **Driving value from postcrisis operational risk management : A new model for financial institutions**
Benjamin Ellis, Ida Kristensen, Alexis Krivkovich, and Himanshu P. Singh

35. **So many stress tests, so little insight: How to connect the 'engine room' to the boardroom**
Miklos Dietz, Cindy Levy, Ernestos Panayiotou, Theodore Pepanides, Aleksander Petrov, Konrad Richter, and Uwe Stegemann

36. **Day of reckoning for European retail banking**
Dina Chumakova, Miklos Dietz, Tamas Giorgadse, Daniela Gius, Philipp Härle, and Erik Lüders

37. **First-mover matters: Building credit monitoring for competitive advantage**
Bernhard Babel, Georg Kaltenbrunner, Silja Kinnebrock, Luca Pancaldi, Konrad Richter, and Sebastian Schneider

38. **Capital management: Banking's new imperative**
Bernhard Babel, Daniela Gius, Alexander Gräwert, Erik Lüders, Alfonso Natale, Björn Nilsson, and Sebastian Schneider

39. **Commodity trading at a strategic crossroad**
Jan Ascher, Paul Laszlo, and Guillaume Quiviger

40. **Enterprise risk management: What's different in the corporate world and why**
Martin Pergler

41. **Between deluge and drought: The divided future of European bank-funding markets**
Arno Gerken, Frank Guse, Matthias Heuser, Davide Monguzzi, Olivier Plantefeve, and Thomas Poppensieker

42. **Risk-based resource allocation: Focusing regulatory and enforcement efforts where they are needed the most**
Diana Farrell, Biniam Gebre, Claudia Hudspeth, and Andrew Sellgren

43. **Getting to ERM: A road map for banks and other financial institutions**
Rob McNish, Andreas Schlosser, Francesco Selandari, Uwe Stegemann, and Joyce Vorholt

44. **Concrete steps for CFOs to improve strategic risk management**
Wilson Liu and Martin Pergler

45. **Between deluge and drought: Liquidity and funding for Asian banks**
Alberto Alvarez, Nidhi Bhardwaj, Frank Guse, Andreas Kremer, Alok Kshirsagar, Erik Lüders, Uwe Stegemann, and Naveen Tahilyani

46. **Managing third-party risk in a changing regulatory environment**
Dmitry Krivin, Hamid Samandari, John Walsh, and Emily Yueh

47. **Next-generation energy trading: An opportunity to optimize**
Sven Heiligtag, Thomas Poppensieker, and Jens Wimschulte

48. **Between deluge and drought: The future of US bank liquidity and funding**
Kevin Buehler, Peter Noteboom, and Dan Williams

49. **The hypotenuse and corporate risk modeling**
Martin Pergler

50. **Strategic choices for midstream gas companies: Embracing Gas Portfolio @ Risk**
Cosimo Corsini, Sven Heiligtag, and Dieuwert Inia

McKinsey Working Papers on Risk

51. **Strategic commodity and cash-flow-at-risk modeling for corporates**
Martin Pergler and Anders Rasmussen

52. **A risk-management approach to a successful infrastructure project: Initiation, financing, and execution**
Frank Beckers, Nicola Chiara, Adam Flesch, Jiri Maly, Eber Silva, and Uwe Stegemann

53. **Enterprise-risk-management practices: Where's the evidence? A survey across two European industries**
Sven Heiligtag, Andreas Schlosser, and Uwe Stegemann

54. **Europe's wholesale gas market: Innovate to survive**
Cosimo Corsini, Sven Heiligtag, Marco Moretti, and Johann Raunig

55. **Introducing a holistic approach to stress testing**
Christopher Mazingo, Theodore Pepanides, Aleksander Petrov, and Gerhard Schröck

McKinsey Working Papers on Risk
June 2014
Designed by Global Editorial Services

www.mckinsey.com