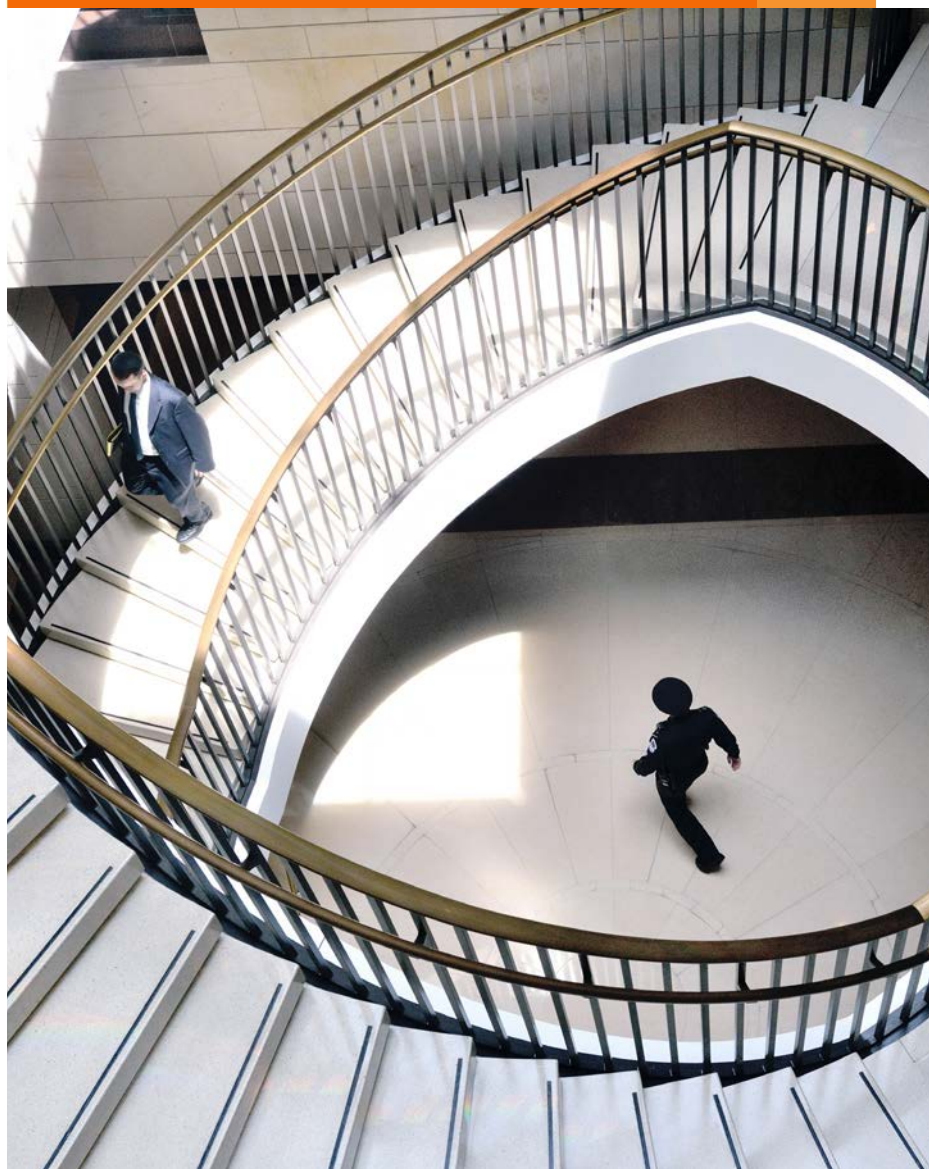


Passing the stress test

PwC survey on regulatory stress testing in banks

*Financial Services Risk
and Regulation
January 2014*







Content

<i>Executive summary</i>	02
<i>Evolving regulatory expectations</i>	06
<i>The survey results:</i>	07
Governance and engagement	07
Operating model	10
Process	14
Results and impact	18
Challenges and priorities	20
<i>Delivering tougher stress tests</i>	22
<i>Appendices</i>	24
<i>About us and about the authors</i>	27

Executive summary



Regulatory stress testing is rapidly emerging as one of the most powerful tools for determining bank capital levels. While it provides the authorities with unique insights into the resilience of the banking industry, it also gives banks the ability to spot emerging risks, uncover weak spots and take preventive action.

The Comprehensive Capital Analysis and Review (CCAR) in the US demonstrates that group-wide regulatory stress tests are complex, resource intensive exercises that require extensive senior management and Board engagement. It's likely that regulatory stress tests in other jurisdictions will follow suit, with local variations on the theme, for example as part of the Comprehensive Assessment by the ECB/EBA.

How banks carry out regulatory stress tests is becoming more critical, simply because of their power to set capital buffer levels, determine management actions and restrict distributions (dividends and employee bonuses). Stress testing sits squarely on the agenda of CEOs.

To assess and manage “stress testing risk”, banks need insights into their own stress testing capabilities and those of their peers. This PwC industry survey provides valuable insights into the current state of play.

Key survey findings

Banks are not prepared for tougher regulatory stress tests

Overall, the participating banks seem confident that they meet current regulatory requirements (for example for ICAAP purposes) reasonably well. However, they seem to be significantly underestimating what they would need to do to meet the demands of a CCAR-like regime and the associated step change in regulatory expectations.

Inadequate people resources

Almost 90% of respondents have fewer than 20 people dedicated to stress tests. This is less than half of what we have seen in comparable US banks – noting that some US banks use significantly more staff.

The banks in our survey rely on small teams to carry out regulatory stress tests, with the majority of respondents revealing gaps in staff capabilities and numbers. In the US, banks have had to increase staff levels in response to ever increasing demands imposed by the Federal Reserve.



More comprehensive Board engagement required

While Boards and senior management are heavily engaged in reviewing results of the stress tests, they are rarely involved in the end to end process of stress testing. This means they are likely to fall short of the increasing regulatory requirement for more comprehensive involvement.

More collaboration needed with the front office

Banks believe that they effectively integrate Finance, Treasury and Risk for stress testing. However, further scope exists for closer collaboration with front office (banks' front-line business and commercial activities). Almost three quarters of respondents feel collaboration with front office is non-functional or partially functional.

Results could have wider use in informing and managing the business

While banks agree regulatory stress tests provide important insights, they struggle to find useful applications in running the business. 95% have never – or very rarely – revised business plans in response to stress test results. Regulatory stress test results are, however, used by some banks to inform decisions relating to risk appetite and de-risking.

Data quality and modelling are top priorities

Banks believe that they are able to reconcile finance and risk data despite consistent and persistent concerns from regulators (and banks) over data quality. However, the majority of banks expect to enhance their stress testing frameworks over the medium term, with data quality and modelling capabilities as top priorities.

PwC view

Regulatory stress testing is moving to the forefront of an ongoing public debate about how banks restore trust and improve their financial health. Banking supervisors around the world are using stress testing as a primary tool to spot emerging risks and set what they believe are adequate bank capital levels. This poses a major challenge for banks, many of whom appear to derive false comfort from their existing capabilities.

Banks will be expected to model more scenarios, across more portfolios, with more speed, accuracy and strategic buy-in than ever before. Our global survey of 24 (largely non-US) banks paints a generally positive picture of their own view of their ability to meet these expectations. However, the experience of our US colleagues in working with CCAR banks suggests that the banks are being optimistic. The resources that CCAR banks dedicate to regulatory stress testing are much greater than the resources that our survey respondents currently have or are planning to acquire.

The operating model for stress testing needs to change. In order to meet future regulatory demands, banks need to move regulatory stress testing from a standalone, siloed process to one that is more strongly integrated with other business activities and strategic planning. The underlying models used to project financial and risk data under stress need to meet a much higher standard of reliability. Stress testing process controls need to be as robust as those used for financial reporting. Boards and senior management need to demonstrate engagement throughout the process.

Banks will need to manage simultaneously the delivery of stress tests and improvements to their stress testing processes. This is a complex challenge which is often complicated by evolving, changing and sometimes impractical regulatory requirements.

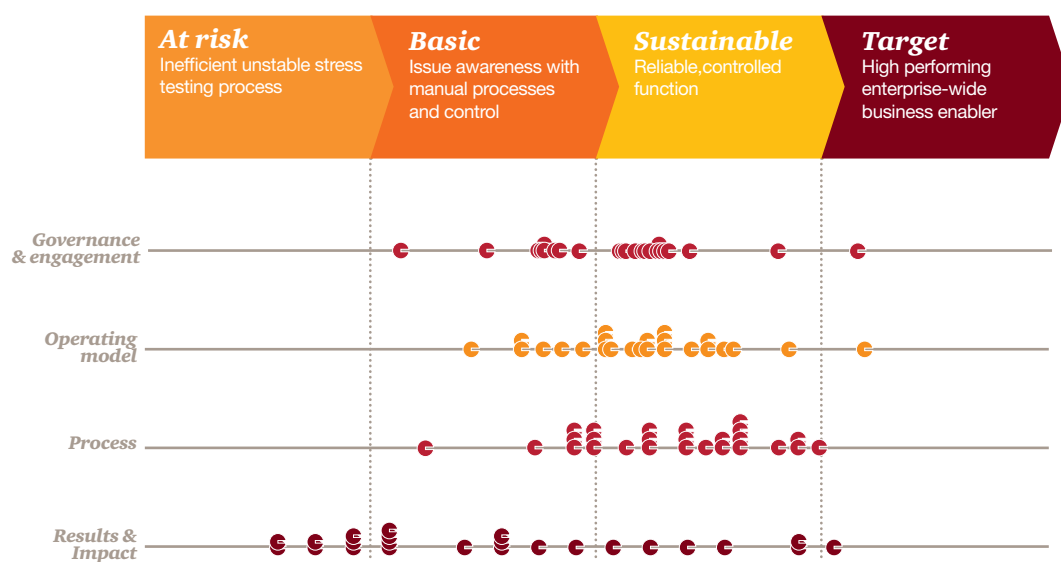
For most banks, stress testing will require sustained focus over an extended period of time. The prize of passing the stress test and not lagging peers could, everything else being equal, include a relatively lower capital buffer.

Excelling at the stress test

We place stress testing approaches into four categories: At Risk (inefficient and unstable), Basic (manual processes and controls), Sustainable (reliable and controlled) and Target (high performing business enabler).

When we look at the responses to the survey across the four key areas - governance and engagement; operating model; process; and results and impact – a picture emerges of banks setting the bar low. Most banks feel their approach works for now, with the majority of responses falling into the Basic or Sustainable categories. But we believe that banks need to strive for a high performing approach in their stress tests if they want to be ready for the regulatory demands that are coming.

Survey results heatmap



Source: PwC Survey 2013

Methodology

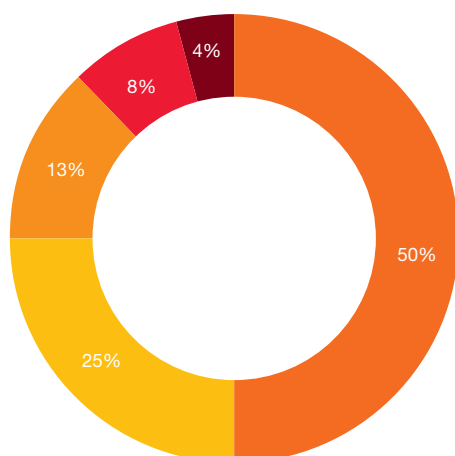
The survey was conducted online during November 2013 and includes banks from 12 different countries across 5 continents. We appreciate and value the time of all those respondents who contributed.

Participant summary

Total number of participants	24
Average asset size	£500bn
Total participant assets	£12tn

Source: PwC Survey 2013

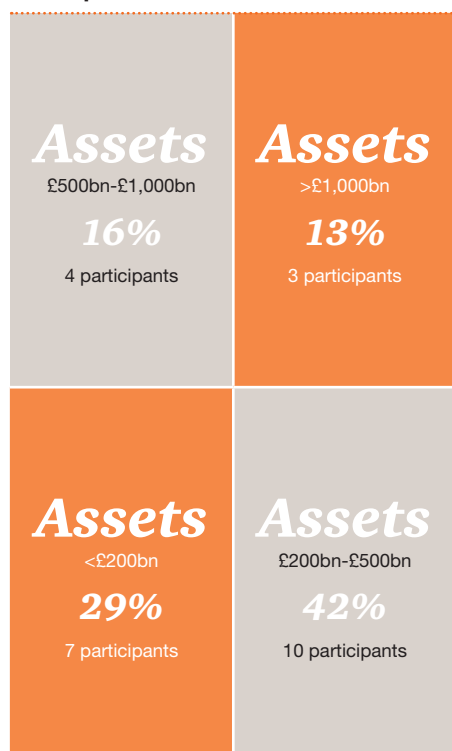
Participant geographical distribution



■ Europe
 ■ North America
 ■ Africa
 ■ Asia
 ■ Australasia

Source: PwC Survey 2013

Participant asset distribution



Source: PwC Survey 2013



Evolving regulatory expectations



The regulatory focus on stress testing is driven by two main themes: the need for banks to demonstrate strengthened risk management and to capital adequacy.

Regulatory stress testing expectations have increased significantly in a short period of time. As part of the introduction of Pillar 2 of Basel II from 2008 onwards, banks were first required to conduct capital stress tests as part of their Individual Capital Adequacy Assessment Process (ICAAP). The effectiveness of the implementation ICAAP stress tests has been mixed across different jurisdictions.

During the global financial crisis and its aftermath, supervisors in several countries used their own stress models to perform their own assessment of bank capital needs.

The financial crisis resulted in a step change in regulatory expectations of banks' stress testing capabilities – particularly in those countries where the crisis impacts were severe. A further transformation is coming, with the UK and EU authorities set to follow the US in introducing regular, comprehensive stress testing regimes. Other jurisdictions are likely to follow suit.

In the Eurozone, in preparation for the ECB assuming full responsibility for banking supervision as part of the Single Supervisory Mechanism and to improve transparency over bank balance sheets, the ECB is undertaking its Comprehensive Assessment. The Comprehensive Assessment which applies to the major banks has three legs: risk assessment, asset quality review, and stress testing. The ECB expects the stress testing element of this major programme, which will be undertaken in collaboration with the EBA, to be completed by November 2014.



Increasing regulatory expectations

The bar is being raised across all elements of the stress testing process. Boards and senior management will be expected to be more closely involved throughout, with an ability to articulate, justify and recognise the limitations of key underlying assumptions and modelling choices.

Banks will be expected to attest that appropriate processes and controls are in place to ensure data quality, robust and validated models and effective challenge of results. These aspects will place additional demands on the risk function and internal audit.

Banks will require flexible stress testing operating models that are able to respond to varying regulatory stress test requests and data requirements.

Stress test results and other modelling insights will be expected to dovetail with, and act as a challenge to, annual business planning and other strategic processes.

The new expectations create challenges for regulators and supervisors themselves. The challenges include finding ways for banks to translate stress scenario assumptions into detailed parameters in a sufficiently consistent way to make industry-wide results comparable. Supervisors also need their own robust systems, enhanced models and data controls to manage and interpret the volumes of data that they receive. They also require additional resources to meet the new standards.

Governance and engagement

Boards and senior management are predominantly engaged with the results of the stress tests and are, therefore, likely to fall short of regulatory expectations of more comprehensive engagement

Increased regulatory expectations for Board and senior management engagement re-emphasise the importance of stress testing as a risk management and supervisory tool. It is no longer sufficient for Boards and senior management to review and challenge the final results – more active engagement in scenario design, assumptions, understanding model limitations and formulation of management actions is expected.

This section explores engagement further and provides insights into:

- Oversight
- Frameworks
- Accountability
- Regulatory engagement

Oversight

It is current industry practice for the Executive Committee to delegate oversight to a Stress Testing Committee. In the majority of instances, this committee plays an active role in the end-to-end process, including scenario design, modelling choices and limitations, assessment of results, consideration of implications and potential management actions. The stress test results are typically communicated to the Executive Committee and the Board towards the end of the process.

The subsequent review and challenge by the Board and senior management is regarded to be very robust. As a result, banks' confidence in the governance over stress test results is consistently high across the industry. Given expectations for increased Board and senior management engagement in the end-to-end process, this view is not necessarily shared by regulators.

Banks will have to find a way to enable Boards, (including non-executive directors) and senior management to participate in the end-to-end process in a more pro-active manner. This is a significant challenge that might require investment, including additional training for some Board members. It might even impact on the composition of some Boards if banks conclude the current members do not have the necessary experience to provide robust challenge to the stress testing process. Clear evidence of this engagement is likely to be critical in convincing the regulators of the challenge provided and value added by the Board and senior management.



Q. Please indicate the level of involvement of each of the following Committees in each of the following stages of the regulatory stress testing process?

Average responses	Board	ExCo	RiskCo	StressCo	Business Unit Co
Scenarios	●	●	●	●	●
Modelling	○	○	●	●	●
Management actions	●	●	●	●	●
Results	●	●	●	●	●
Communication	●	●	●	●	●

○ None ● Low ● Medium ● High

Source: PwC Survey 2013

Frameworks

All of the banks surveyed have an overarching stress testing framework in place but many of them acknowledge that enhancements are required. Notably, firms that rate their frameworks poorly are also planning to undergo a significant stress testing process overhaul. These banks recognise that the new regulatory requirements require a step change in approach. However, most remain confident that their current processes are fit for purpose and do not currently plan to invest further to meet regulatory expectations.

Accountability

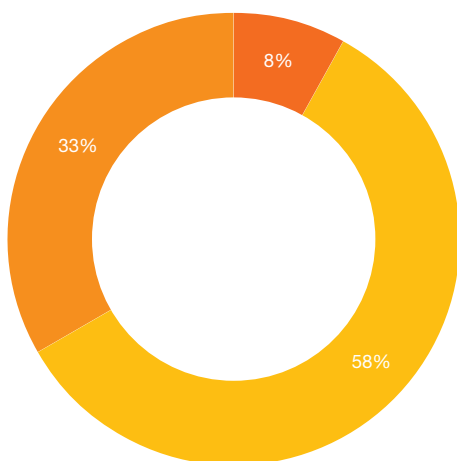
In the majority of instances, the Chief Risk Officer (CRO) is responsible for the overall stress testing programme. Frequently, this responsibility is shared with the Chief Financial Officer (CFO) (most of the responses in 'other' reflect joint CRO and CFO accountability).

A close working arrangement between Finance and Risk will be an important feature of more advanced and robust stress testing processes. Not surprisingly, a collaborative approach between Finance and Risk is also an explicit regulatory expectation.

Regulatory engagement

Consistent with industry perspectives regarding Board and senior management engagement, the majority of banks indicated engagement with regulators is currently more focused on discussion of the results. To date, other aspects of the stress testing process have not been consistently challenged by regulators.

Q. Please indicate the efficacy of your overarching regulatory stress testing framework that covers the process from end to end?



■ Substantially non-functional
 ■ Partially non-functional
 ■ Largely functional
 ■ Fully functional

Source: PwC Survey 2013

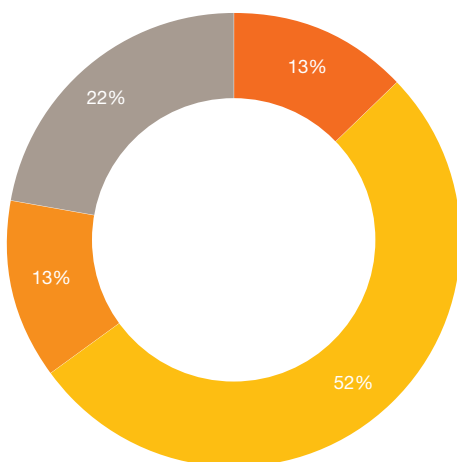
We expect this will change as supervisors adopt a more pro-active engagement model to provide robust challenge to the end-to-end process. For example, a key feature of the proposed UK stress testing regime includes bilateral and ongoing interactions between the regulator and the banks in areas such as scenario design and modelling.

The relatively short timescales under which regulatory stress tests will be conducted further supports the need for closer collaboration throughout the process to avoid surprises. For example, the CCAR process conducted in the US is typically completed within 6 months. This is consistent with the envisaged timescale for the UK regime, which is expected to be finalised 7 months after the date of the balance sheet information used as inputs to the stress tests. In the Eurozone, the stress tests planned for the ECB's Comprehensive Assessment, are likely to be under an even shorter time-frame (likely maximum 4 months) prior to the ECB's Single Supervisory Mechanism coming into force from November 2014.

The increased demands that such an engagement model will place on resources – at the banks but also on regulatory staff – should not be underestimated.

We also expect regulators to play a much more active role in the final decisions relating to management actions. In particular, the Bank of England will request banks to submit a menu of potential management actions in response to forecasted capital pressures. It is our understanding that this will form the basis for bilateral discussions regarding the most appropriate action given the specific circumstances.

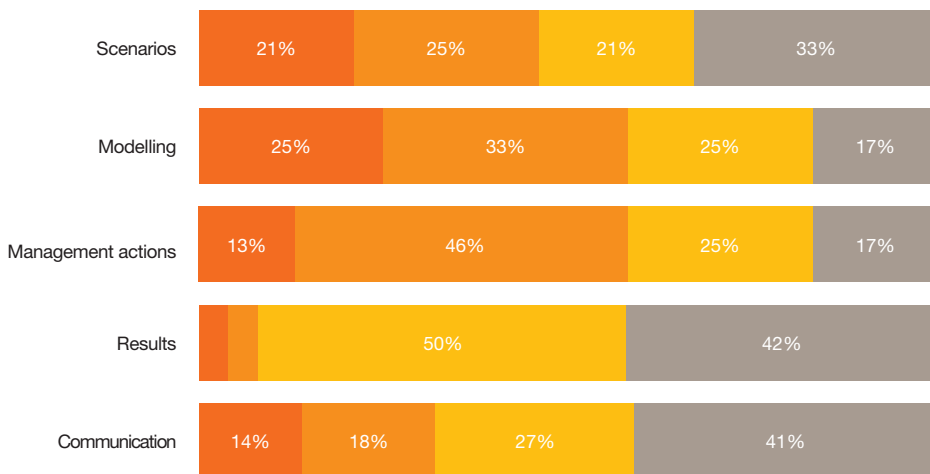
Q. Who takes overall ownership of the regulatory stress testing process?



■ CFO
 ■ CRO
 ■ Global head of stress testing
 ■ Other

Source: PwC Survey 2013

Q. Please indicate the level of engagement with regulators at each of the following stages of the regulatory stress testing process?



■ None ■ Low ■ Medium ■ High

Source: PwC Survey 2013

Operating model

Banks effectively integrate Finance, Treasury and Risk in conducting regulatory stress tests but front office interaction is limited

The increased regulatory demands in relation to stress testing will require close collaboration between various areas, most notably Finance, Treasury and Risk. In addition, we expect front office (i.e. banks' frontline commercial business unit) and Internal Audit to play a much more prominent role in some aspects of the stress testing process. We also expect increased integration between stress testing processes and other disciplines, such as business planning and risk management.

This section explores current levels of integration and provides further insights into:

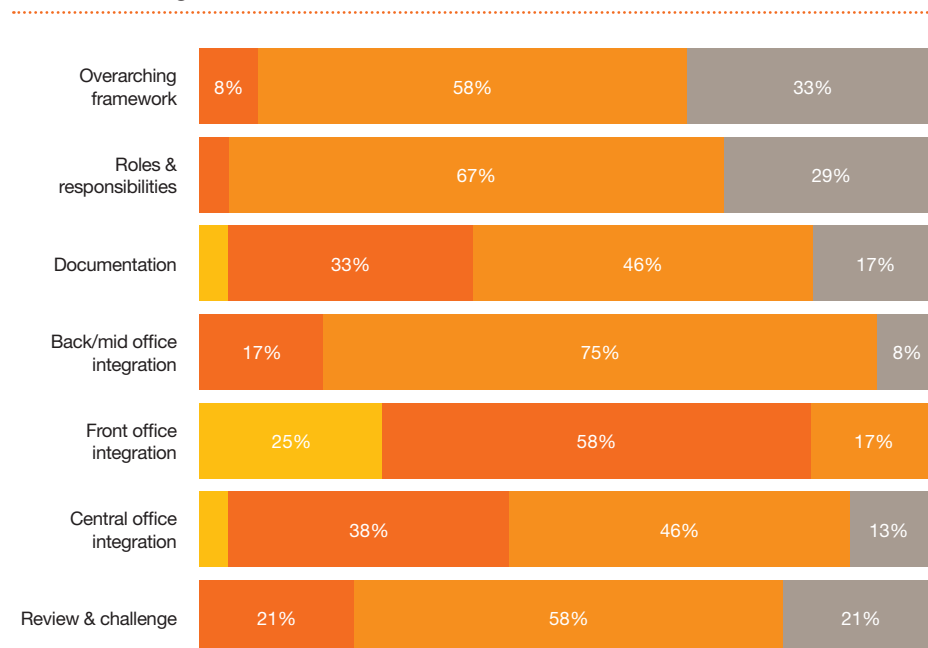
- Integration between teams
- Links with other disciplines
- Documentation of modelling assumptions
- Stress testing models

Integration between teams

Banks believe that, in general, Finance, Treasury and Risk are well integrated in delivering group-wide regulatory stress tests. This is partly attributable to well-defined roles and responsibilities and experience banks have gained in conducting stress tests as part of the ICAAP. However, some banks acknowledge further scope exists for a closer working relationship between central teams (responsible for coordinating the process and collating results) and other areas, such as Finance and Risk. In our experience, a more collaborative approach should reduce stress testing delivery risks.

Some banks acknowledge further scope exists for a closer working relationship between central teams

Q. Please indicate the efficacy of your regulatory stress testing process in each of the following areas?



■ Substantially non-functional ■ Partially non-functional ■ Largely functional ■ Fully functional

Source: PwC Survey 2013

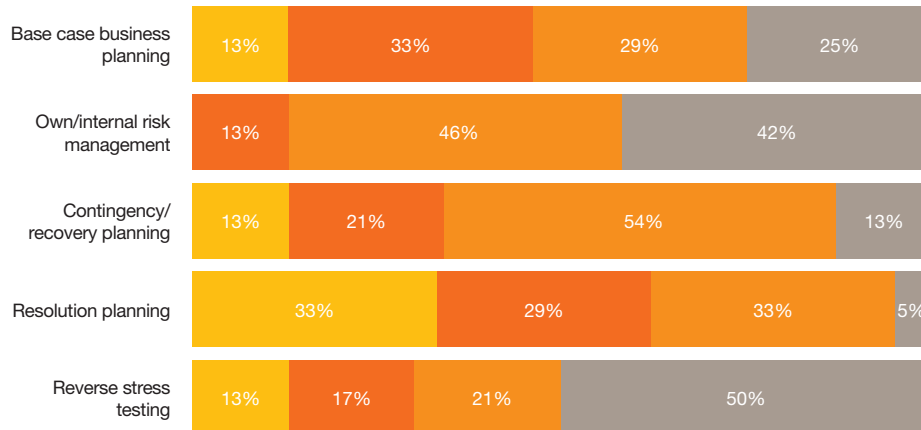
50%

...of respondents said that **model oversight & approval** is the responsibility of their risk community

25%

...said a dedicated **model review team** had the responsibility.

Q. To what extent is regulatory stress testing a separate exercise to the following?



■ No interaction ■ Limited interaction ■ Fair interaction ■ Significant interaction

Source: PwC Survey 2013

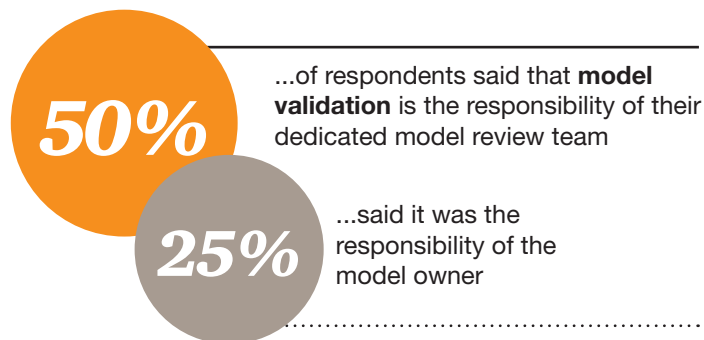
Most banks also acknowledge front office could play a more meaningful role in the stress testing process. Indeed, this will be required going forward to enable stress testing teams to reach informed and balanced conclusion regarding idiosyncratic risks that should be incorporated in the firm-specific stress scenarios.

Links with other disciplines

Regulatory stress tests are standalone, siloed processes in many organisations. For example, banks are yet to align stress testing with some of the other relatively new regulatory disciplines, most notably recovery and resolution planning, despite the obvious similarities between these processes. We expect these processes will become more closely aligned as banks embed their approaches to meeting these regulatory requirements in the near future.

Regulatory stress testing is more closely aligned to some of the well-established processes, including business planning, risk management and reverse stress testing.

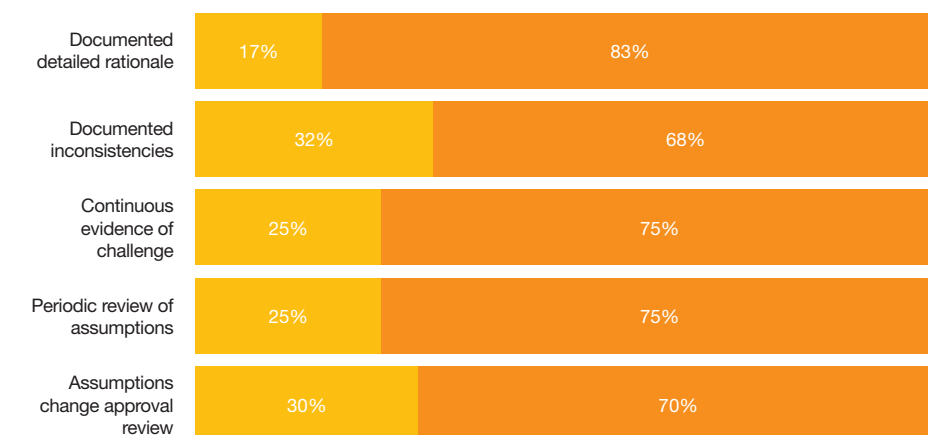




Documentation of modelling assumptions

The majority of banks currently maintain detailed documents that explain the rationale for modelling assumptions. These assumptions are periodically reviewed and the review process is documented. Banks typically use these documents to demonstrate the reasonableness of model assumptions to regulators. More specifically, three quarters are able to provide regulators with continuous evidence of management challenges to model assumptions.

Q. How do you evidence to regulators the reasonableness of the assumptions used in your regulatory stress tests?



■ No ■ Yes

Source: PwC Survey 2013

Stress testing models

Enhanced model governance will become a key feature of regulatory expectations. More specifically, regulators expect stress testing models to be subjected to the same governance and control as credit risk models. This poses a significant challenge for many banks, particularly those that are very reliant on spreadsheets to conduct stress testing (21% of respondents) or those that use disparate systems. The enhanced governance requirements include an expectation of Board and senior management oversight. Our survey results suggest some banks will have to reconsider these oversight arrangements to meet regulatory expectations going forward.

Some banks are also considering to what extent a central team should retain ownership over stress testing models. This should allow greater governance and oversight, including better control and enhanced transparency over validation efforts. An obvious drawback of this approach is reduced ownership by business units and potentially lower levels of integration with the central team. In addition, the central team might not have the capacity to validate all the models on a periodic basis.

A number of firms commented that the seniority of the model review team is correlated to model materiality. Model owners are allowed to review models with a reduced impact on the overall stress testing results but more material models are independently reviewed, e.g. Model Governance Committees typically review the most material models.

Internal Audit does not typically contribute to model oversight and validation. However, in some instances Internal Audit is responsible for conducting model reviews.

63%

...of respondents said that independent model review is the responsibility of their model review team

17%

...said it was the responsibility of the internal audit



**Less
than
£1m**

76% of respondents reported that the total staff cost of conducting a regulatory stress test did not exceed £1m

Process

Banks are typically able to reconcile finance and risk data despite regulatory concerns over data quality

We expect additional investment will be required to deliver robust, flexible infrastructures with the capacity to facilitate timely processes built on consistent, high quality data. Tactical solutions are unlikely to meet increased expectations over the medium term. References to future attestations of stress testing processes and controls by Internal Audit reinforce the need for further investment.

This section explores the extent to which bank infrastructures are fit for purpose and provides further insights into:

- Resourcing
- Processing time
- Data quality
- Technology

Resourcing

Banks are currently reliant on relatively small teams of dedicated resources to conduct regulatory stress tests - 88% of respondents reported having fewer than 20 staff dedicated to regulatory stress testing and only one respondent had more than 50.

Additional staff involvement is also fairly limited with most respondents relying on less than a quarter of the time of fewer than 20 additional staff to support their core stress testing teams.

It is, therefore, not surprising that regulatory stress tests are not currently a very expensive exercise for the banks, (in terms of staff resources).

Past experience has shown that very demanding regulatory stress testing regimes might require larger teams with the appropriate skills to deliver value. For example, many of the US banks have added to staff levels in response to ever increasing stress testing demands imposed by the Federal Reserve Bank as part of CCAR. The additional staff are involved in on-going improvement of stress testing processes as well as the execution of the stress tests. In addition to the full-time core stress testing team, a group-wide stress test involves inputs from a large number of people across the bank. One large US bank (not in the survey) estimated that 500 people are involved. In our experience the core teams in some US banks are in the range of 40-70 individuals.

Most respondents do, however, acknowledge additional investment will be required. For example, only 13% of respondents reported they already have sufficient, adequately skilled staff to conduct regulatory stress testing with most others citing some gaps in existing staff capabilities and, more typically, numbers.

Q. To what extent are additional operational staff (FTEs) required to complete regulatory stress tests?

Additional staff resource	0	20	50	100	200
	52%	39%	4%	0%	4%
Average timespent (%)	0	10	25	50	75
	52%	26%	17%	4%	0%

Source: PwC Survey 2013

Despite the general recognition of a shortfall in staff resources, no respondents expect to take on more than 20 new staff dedicated to regulatory stress testing in any of the next three years.

This may leave respondents considerably short of the resources deployed by some of the large US banks subject to CCAR, notwithstanding differences in the regulatory regime, as well as size and business models of respondents.

Processing time

All respondents indicated the regulatory stress testing process takes between one and four months to complete, with a fairly even split across this range.

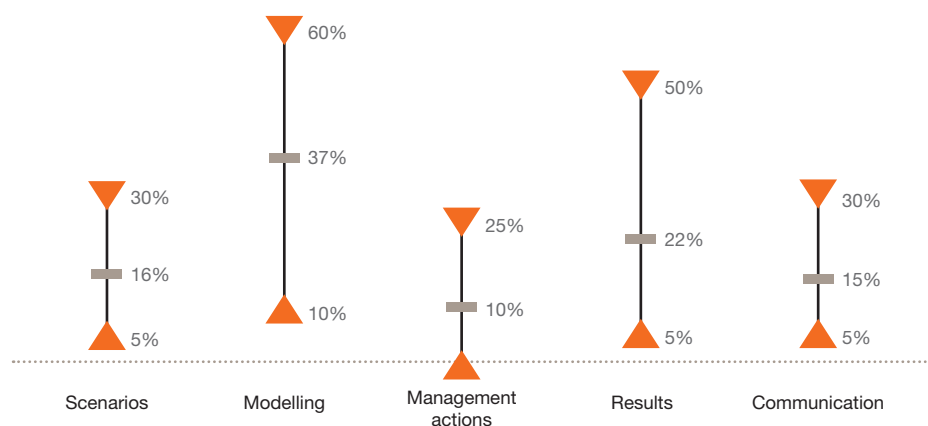
In order to meet the proposed timelines for regulatory stress testing in the near future, some banks will have to look for ways to streamline processes. The pressure to meet relatively tight deadlines will be further exacerbated by expectations of greater engagement with Boards and senior management internally and regulators externally. Furthermore, global banks subject to multiple stress testing regimes are likely to face competing demands on their time, regardless of the best efforts of regulators to achieve international co-ordination.

Q. Which of the following best describes your current regulatory stress testing staff resources?

Staff capability	At least sufficient	Some gaps	Significant gaps
	8%	38%	13%
	8%	25%	8%
	Significant gaps	Some gaps	At least sufficient
	0%	0%	0%
Staff numbers			

Source: PwC Survey 2013

Q. How is this time split between each stage?

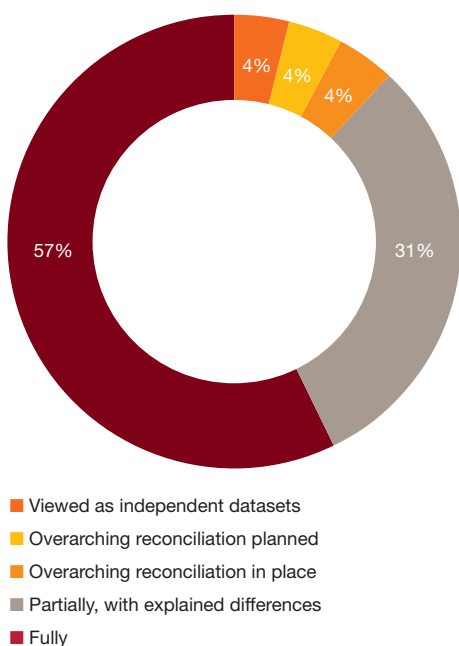


— Average ▼ Max ▲ Min

Source: PwC Survey 2013



Q. To what extent are you able to reconcile the base data used in regulatory stress testing to your audited financial results?



Source: PwC Survey 2013

Not surprisingly, modelling typically consumes the most time, followed by evaluation of results. Investment in technology should contribute to a significant reduction in the overall delivery time. This should free up resources to focus on some of the higher impact areas, such as management actions and stakeholder engagement.

Data quality

Data quality does not appear to be a significant concern for banks. 57% of respondents indicated they are currently able to fully reconcile audited financial data with the base data used in regulatory stress testing and a further 31% are aware of, and could explain, differences arising from a partial reconciliation. This positive message appears somewhat at odds with regulators' concerns about observed difficulties in reconciling risk data with reported balance sheets and risk-weighted assets.

Technology

Respondents cited a range of third-party IT systems used to conduct regulatory stress testing. Many banks, however, do not rely on a specific vendor solution – 33% developed their own internal systems and 21% remain partially or wholly reliant on Excel spreadsheets.

We suspect reliance on Excel spreadsheets will not be a sustainable solution going forward, particularly for those banks that will have to comply with multiple regulatory regimes, i.e. US CCAR, UK BoE/PRA and ECB/EBA requirements. Furthermore, we expect weaknesses in data reconciliation or modelling capabilities will be placed under increasing pressure as regulatory stress testing demands intensify.

With this in mind, 47% of respondents plan to invest materially in technology over the next three years, citing a wide range of intended objectives. This investment is expected to bear fruit, both in terms of avoiding the regulatory costs associated with modelling deficiencies and in freeing up time and resources to dedicate to other parts of the regulatory stress testing process where there is scope to add greater value. It is also expected to benefit the wider controls environment.



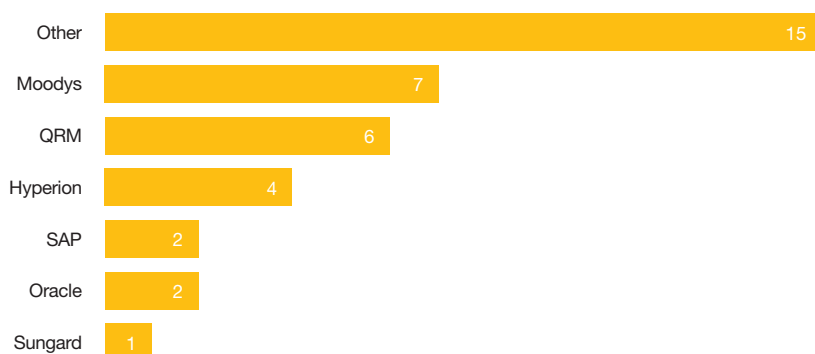
100%

...of respondents said that model oversight & approval is the responsibility of their risk community

72%

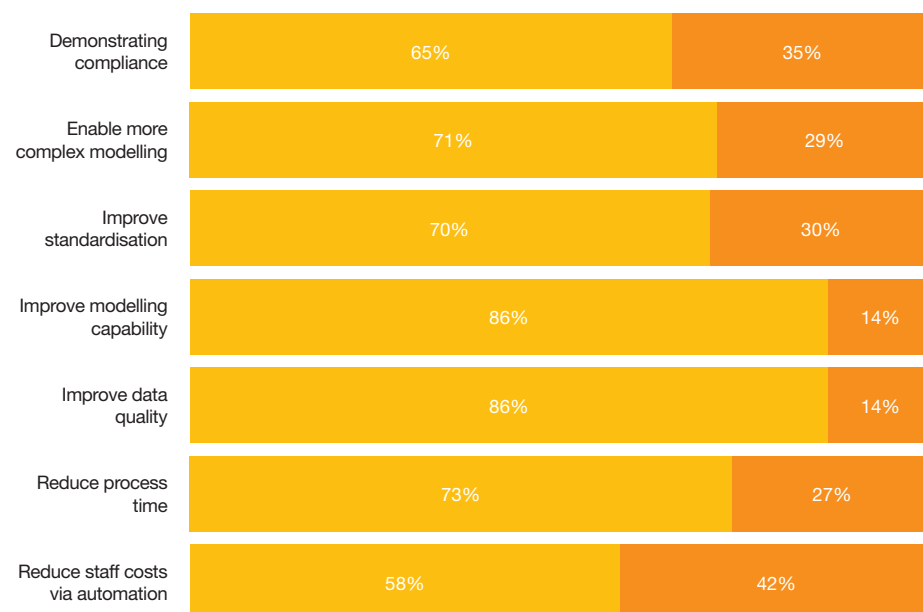
...said a dedicated model review team had the responsibility

Q. Which IT systems do you currently use for stress testing?



Source: PwC Survey 2013

Q. What are the intended objectives of your planned IT investment?



■ No ■ Yes

Source: PwC Survey 2013



Banks should aim to leverage the insights gained to inform other processes, including short and medium term planning.

Results and impact

While regulatory stress tests provide useful insights, banks have struggled to convert these to strategic change

It is clear that the increased regulatory stress testing requirements will absorb significant Board and senior management time. In some instances, banks might also be required to hire additional staff or invest in technology to make the step change required. As a result, regulatory stress testing can no longer be viewed as an independent process.

Banks should aim to leverage the insights gained to inform other processes, including short and medium term planning. Our survey results suggest further scope exists for banks to integrate regulatory stress testing outputs more closely with other processes.

This section explores integration with other processes more closely and provides insights into the impact of regulatory stress testing on:

- Strategy
- Risk management

Strategy

Insights gained from scenario analysis could be used to inform business strategy - highlighting areas of opportunity, as well as potential vulnerabilities that could be addressed by reducing or re-pricing risk or re-structuring liabilities.

Banks tend to agree that regulatory stress tests provide useful insights that are helpful in running the business. Surprisingly, almost all of the banks indicated they had never – or very rarely – adjusted their short-term or medium-term business plans in response to regulatory stress testing results. This speaks to regulatory concerns about a lack of integration of stress testing and business planning processes and presents a clear opportunity to align these aspects more closely in the future – both to meet regulatory expectations and to maximise the value derived from regulatory stress testing.

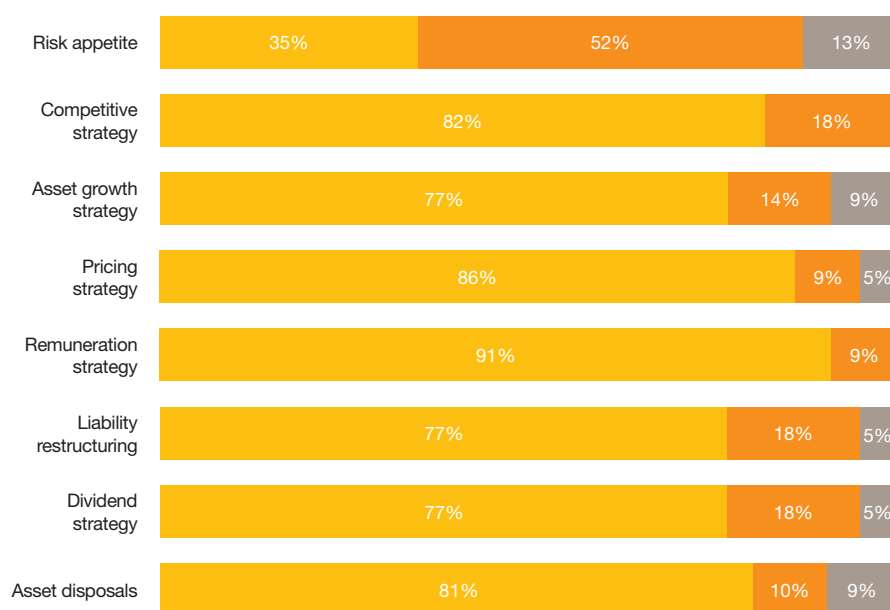
Q. Have you ever revised your business plans in response to regulatory stress testing results?

	No, never	Yes, but very rarely	Yes, occasionally	Yes, regularly
Short-term plan/budget	55%	40%	5%	0%
Medium-term plan	52%	44%	4%	0%

Source: PwC Survey 2013



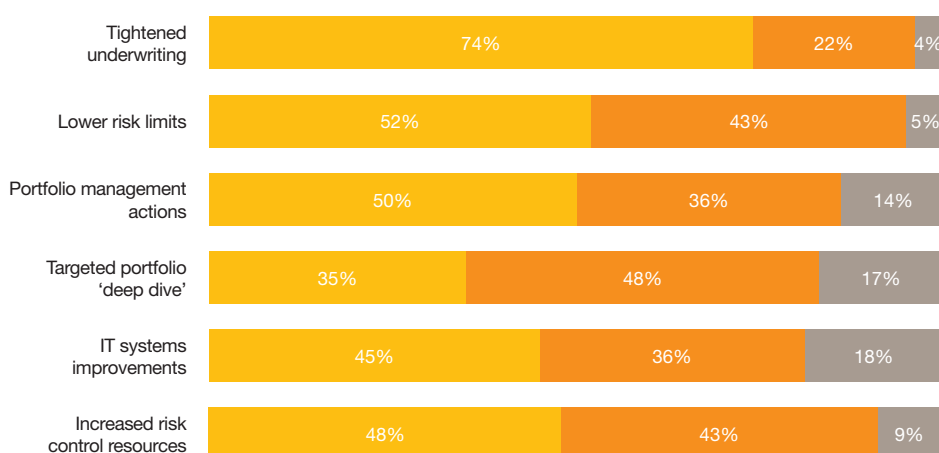
Q. Which of the following have you changed in response to regulatory stress testing results?



■ No change ■ Minor change ■ Major change

Source: PwC Survey 2013

Q. What type of risk control actions have you taken in response to regulatory stress testing results?



■ No change ■ Minor change ■ Major change

Source: PwC Survey 2013

Regulatory stress testing is also not currently closely aligned to other strategic processes, such as competitive positioning, asset growth, pricing and distributions. Risk appetite is the clear outlier as 65% of banks indicated some changes were introduced as a direct consequence of regulatory stress testing outputs.

With regulation having an ever-increasing impact on strategy and stress testing playing a progressively more prominent supervisory role, it is difficult to envisage an outcome where strategic planning continues to occur in isolation from regulatory stress testing.

Risk management

To date, regulatory stress testing has had a positive impact on risk management practices, albeit only resulting in minor changes in tightening of underwriting criteria and reduction of risk limits for example. However, the insights gained from regulatory stress testing had a more pronounced impact on portfolio management practices, portfolio deep dives and IT infrastructure.

As noted previously, many banks are currently considering additional investment in technology and will look to increase resources to meet the increased regulatory stress testing demands. The resulting impact on risk management practices is expected to be positive.



Challenges and priorities

Most banks expect to develop their existing stress testing frameworks over the next three years - improving data and modelling capabilities are top priorities

Banks recognise that regulatory developments will place increasing demands on their stress testing capabilities but view the future as an evolution rather than a revolution.

Top 5 challenges

Data requirements and modelling approaches were most commonly cited by respondents as one of the top 5 stress testing challenges moving forward, despite expressing a reasonable degree of comfort with current capabilities in these areas. This perhaps reflects an expectation of increased frequency and granularity of regulatory stress testing demands.

Q. What do you consider to be the top 5 challenges that you will face in updating your current regulatory stress testing process?

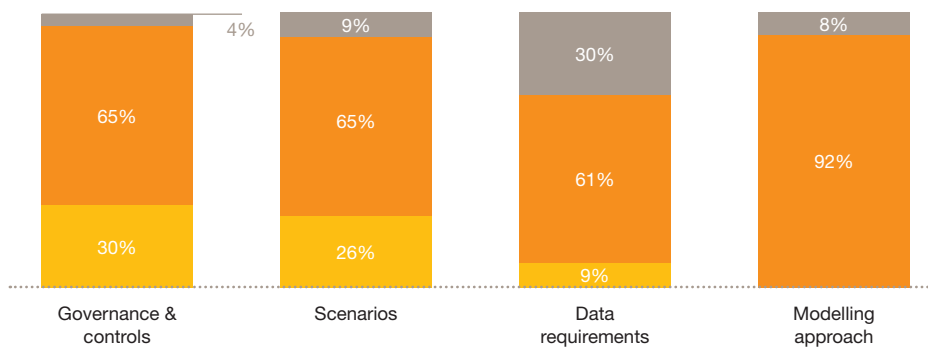


Source: PwC Survey 2013

Framework improvements

Most banks expect to develop their existing framework for regulatory stress testing over the course of the next three years, although around one third of respondents plan to implement a new framework for data requirements.

Q. Do you envisage making significant changes/enhancements in the following areas over the next 3 years?



■ Yes - introduce a new framework ■ Yes - develop existing framework ■ No - retain existing framework

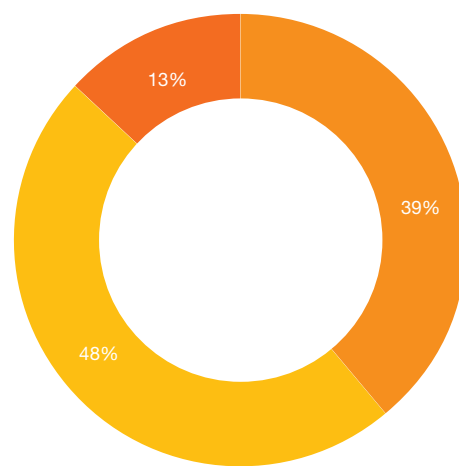
Source: PwC Survey 2013

Response to new regulatory demands

Almost half of respondents plan to develop a single process to deal with regulatory stress testing requests from multiple regulators, including the US CCAR exercises, the proposed UK stress testing regime and the imminent ECB/EBA stress tests. Most of the other respondents intend to co-ordinate separate processes. These may come under increasing pressure as other jurisdictions introduce stress testing regimes.

Banks impacted by the proposed UK stress testing regime have either not yet started or are at an early stage in considering what actions will be required to meet regulatory expectations. Most progress to date has been with respect to data requirements. Similarly, as of January 2014, those Eurozone banks, which are impacted by the upcoming ECB/EBA stress test, are just beginning to get prepared, as most have needed to focus their efforts to date on preparing for the asset quality reviews.

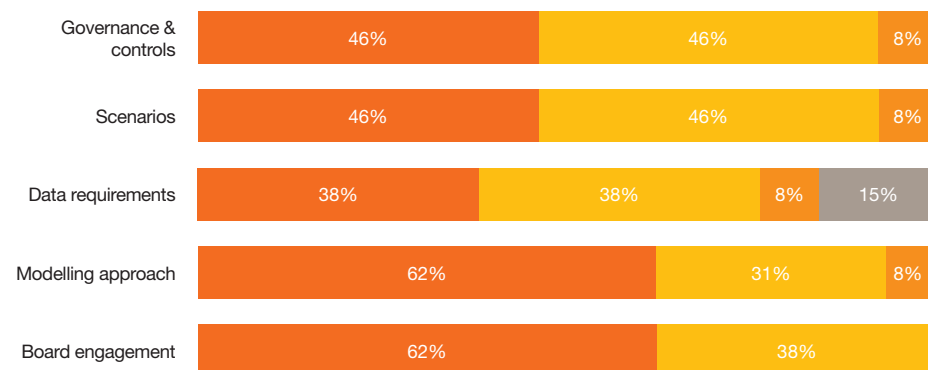
Q. How do you intend to manage multiple regulatory stress testing requirements (e.g. UK, US CCAR, EBA, ICAAP as applicable)?



- We will have separate processes but compare methodologies and results
- We will develop a single process that can respond to all requests
- Other

Source: PwC Survey 2013

Q. What actions are you considering/have you initiated as a result of the Bank of England's regulatory stress testing discussion paper (if applicable)?



■ Not yet started ■ Analysis ■ Design ■ Construction

Source: PwC Survey 2013

Delivering tougher stress tests

With tougher stress tests on the horizon, we explore below some of the key actions for both Boards and senior management and those in stress test teams.

Governance and engagement

Board and senior management

- **Make time:** create more space on the agenda for stress testing. Regulatory stress testing should form a more prominent and recurring component of Board and senior management agendas.
- **Show me:** decide how you will demonstrate comprehensive engagement in the end-to-end process, including input and challenge provided to scenarios and modelling assumptions.
- **Oversee:** carefully consider how to strengthen oversight arrangements to meet future regulatory expectations.

Stress test team

- **Prepare to engage:** get ready for much more intensive engagement with regulators on the entire regulatory stress testing process, including measures put in place to address shortcomings.
- **Communicate:** pro-actively engage your colleagues and internal stakeholders.

Operating model

Board and senior management

- **Approve:** review and approve the target operating model for group wide regulatory stress testing, including plans and budget to transition to the target state.
- **Embed:** think about how stress testing could become part of the fabric of decision-making through areas like risk appetite and business planning.

Stress test team

- **Set the long-term target:** deal with the tactical pressures but be clear on the target operating model for regulatory stress testing, including model governance arrangements and interactions between various teams
- **Integrate:** consider stress testing as part of the fabric of strengthened risk and capital management.

Process

Board and senior management

- **Monitor:** make sure you have visibility over the stress testing improvement programme.
- **Approve:** challenge and agree scenario assumptions.
- **Support:** support the stress test team in identifying and/or removing road blocks to implementation.

Stress test team

- **Resource up:** critically evaluate resource requirements and take steps to address shortages - both immediate and longer-term.
- **Improve the data:** evaluate data quality and remediate significant deficiencies as a priority.
- **Model more smartly:** enhance modelling capability to achieve a better balance between modelling and data processing and other value adding activities, such as assessing implications and management actions.

Results and impact

Board and senior management

- **Set appetite:** be clear on your view of appropriate capital buffers.
- **Challenge:** test the approach and the results.
- **Apply:** consider how the results and insights may be applied to running the business better.

Stress test team

- **Test and re-test:** evaluate the results from a wide range of perspectives to make sure they are robust.
- **Synthesise and communicate:** make sure that the stress test scenarios, results and management actions link together as a convincing and sensible story.
- **Continuously improve:** assess the process as well as the results and consider what priority improvements are required.

Appendix

Compiling the heatmap

Our diagram on page 4 shows how the responses to the survey across four categories. Here we provide details on how we compiled that heatmap. The table below provides generic examples of behaviours associated with different levels of stress testing capabilities (this is not intended to be an exhaustive list).

	<i>At risk</i> Inefficient unstable stress testing process	<i>Basic</i> Issue awareness with manual processes and control	<i>Sustainable</i> Reliable, controlled function	<i>Target</i> High performing enterprise-wide business enabler
<i>Governance & engagement</i>	• Skill and capability requirements loosely defined. • Little to no documentation of governance structures. • Little to no challenge beyond the stress testing team.	• Skill and capability requirements defined. • Historic stress testing actions documented. • Annual engagement with Board and senior management.	• Skill and capability requirements refined and enhanced frequently. • Standard policies and framework documented and maintained. • Frequent engagement with Board and senior management.	• Skill and capability requirements pro-actively and continuously enhanced. • Regulatory stress testing takes place within a robust framework with documented policies and procedures and regular engagement by the Board and senior management.
<i>Operating model</i>	• Regulatory stress testing is largely conducted by a single business area operating somewhat as a silo and takes place in isolation from other business planning and risk management activities.	• Consistent structures exist with clear functional boundaries between Risk, Finance and LOB. • Some integration between Finance Treasury and Risk departments. • Some functions are centralised.	• Finance, Treasury, Risk, central and regional teams work together effectively to conduct regulatory stress testing, which forms part of a co-ordinated suite of business planning and risk management tools.	• Integrated framework fully aligned to Basel, ICAAP, contingency, recovery and resolution planning. • Ability to expand functionality and link other areas (RWA, ICAAP, liquidity risk, ALM).
<i>Process</i>	• Scenario analysis, loss forecasting, aggregation and reporting processes are informally documented, not standard and disconnected. • Issues are partially known and managed reactively. • Data cannot be reconciled to financial results.	• A combination of manual workarounds and a temporary increase in staff resources facilitate regulatory stress testing to the point that feasible outputs can be produced in time to meet deadlines but subject to limited quality control. • Data cannot be reconciled to audited financial results but differences are known.	• IT systems and the quality and quantity of staff resources are broadly sufficient to support regulatory stress testing but additional investment could streamline the process, resulting in more time to review the inputs and outputs. • Data reconciled to audited financial results and differences are fully explained.	• Regulatory stress testing is conducted by appropriately skilled specialist staff with sufficient time for value-adding engagement with inputs to, and outputs from, the process - sophisticated IT infrastructure is leveraged. • Data is fully reconciled to audited financial results.
<i>Results & impact</i>	• Regulatory stress testing is only performed to meet a regulatory requirement but adds little or no value in the context of how the business is run and controlled.	• Regulatory stress testing is largely viewed as a self-contained activity although it occasionally produces results which influence a slight change in underlying strategy.	• Regulatory stress testing results influence business planning and/or risk management decisions but there is no systematic framework for capturing this.	• Regulatory stress testing is a core part of business planning and risk management, regularly producing insights that result in changes to strategic direction and improvements in risk controls.

The table below summarises the questions and answers that contribute to respondents' position on the stress testing heatmap. Each answer is mapped to a ranking scale from 1 (At risk) to 4 (Target). Ranking scores are averaged for all questions within each of the four categories.

Category	Questions	At risk (1)	Basic (2)	Sustainable (3)	Target (4)
Governance & engagement	Q2(a). Please indicate the level of involvement of the Board in each of the following stages of the regulatory stress testing process	1	2	3	4
	Q2(b). Please indicate the level of involvement of ExCo in each of the following stages of the regulatory stress testing process	1	2	3	4
	Q3. Please indicate the level of engagement with regulators at each of the following stages of the regulatory stress testing process	1	2	3	4
	Q4. Please indicate the efficacy of your regulatory stress testing process in each of the following areas: overarching framework; roles and responsibilities; documentation; and review and challenge by senior management and the Board	Poor	Moderate	Good	Excellent
Operating model	Q4. Please indicate the efficacy of your regulatory stress testing process in each of the following areas: integration/ engagement between risk, finance, treasury and dedicated stress testing functions; integration/engagement with front office business areas; integration/engagement between central and local teams (by geography)	Poor	Moderate	Good	Excellent
	Q6. To what extent is regulatory stress testing a separate exercise to: base case business planning; own/internal risk management; recovery/ contingency planning; resolution planning; reverse stress testing?	No overlap/ influence	Limited overlap/ influence	Fair degree of overlap/ influence	Significant overlap/ influence
Process	Q8. To what extent are you able to reconcile the base data used in regulatory stress testing to your audited financial results?	Viewed as independent dataset/ overarching reconciliation planned	Overarching reconciliation in place	Partial reconciliation with explained differences	Full reconciliation
	Q12. Which of the following best describes your current regulatory stress testing staff resources?	Significant shortage	Some Gaps	-	Sufficient/ excessive
	Q13(a). How long does the regulatory stress testing process take from start to finish?	More than 6 months	4-5 months	3-4 months	Less than one month
	Q13(b). What percentage of this time is spent modelling?	>75%	51-75%	33-50%	<33%
Results & impact	Q16. Have you ever revised your business plans in response to regulatory stress testing results?	No - never	Yes - but very rarely (once or twice)	Yes - occasionally (three or four times)	Yes - regularly (more frequently)
	Q17. Which of the following strategic actions have you changed in response to regulatory stress testing results?	1 + sum of minor changes (0.5) and major changes (1) capped at 4			
	Q18. What type of risk control actions have you taken in response to regulatory stress testing results?	1 + sum of minor changes (0.5) and major changes (1) capped at 4			

About us

We help financial companies to confidently navigate regulatory change. Financial organisations need integrated and practical solutions that cover the entire regulatory agenda and beyond.

These changes need to deliver real and significant benefits to the business as a whole. Our global network of experts recognise that every business is different. We can help you to assess the impact of regulation on your business, mitigate that impact and develop and implement a strategic response that empowers you to take control of the regulatory agenda.

PwC's Financial Services Risk and Regulation team works with the industry to respond to changing regulation and emerging market risks. Our UK team brings together over 50 Partners and 800 professional staff to share their thinking, experience and solutions to develop fresh perspectives and practical advice. We are working with clients across the banking sector to plan for and implement regulatory stress testing.

About the authors



Keith Ackerman

Keith is a partner in the Financial Services Risk and Regulation team of PwC, with 13 years' experience in advising our banking clients on a range of regulatory and financial reporting matters. He recently worked with the government and the banking industry in South Africa to develop a national response to the Basel III liquidity requirements.

Keith has led strategic reviews for some of our banking clients to assess the impact of Basel III on their business models and advised on tactical and strategic responses. During 2010, he led a team that developed a verification strategy for assets held by banks affected by the global financial crisis on behalf of Her Majesty's Treasury in the UK.



Richard Barfield

Richard is a Director in the Financial Services Risk and Regulation team of PwC. He advises clients on how to develop and strengthen risk management and respond to regulatory change, in particular, Basel III

His recent advisory work includes leading engagements on risk management and governance, risk appetite, stress testing (group-wide, recovery and resolution, ICAAP), linking risk and reward and assessing business performance from a risk perspective.

Richard is the consultant editor of PwC's book: "A Practitioner's Guide to Basel III and Beyond" (2011). During 2010, he was a key member of the PwC team that worked with the six larger UK banks and the BBA to assess the implications of Basel III and the wider reform agenda for the UK banking industry.



Michael Snapes

Michael is a senior manager in the Financial Services Risk and Regulation team of PwC. He has recently assisted a number of clients in considering the strategic and compliance-related impact of Basel III and structural reforms on their business models.

Michael has 11 years' experience within the regulatory community, most recently managing the impact of the financial crisis at the Financial Services Authority and developing policy responses at the Independent Commission on Banking and the Bank of England.

Contacts

Keith Ackerman

keith.d.ackerman@uk.pwc.com
+44 (0)20 7213 2770

Richard Barfield

richard.barfield@uk.pwc.com
+44 (0) 20 7804 6658

Contributors

Miles Kennedy

miles.x.kennedy@uk.pwc.com
+44 (0) 20 7212 4440

Sam Wilkinson

samuel.j.wilkinson@uk.pwc.com
+44 (0)20 7804 7512

Peter El Khoury

peter.elkhoury@uk.pwc.com
+44 (0)20 7804 1852

Paul Minter

paul.j.minter@uk.pwc.com
+44 (0)20 7213 1839

Your local contacts

Australia

Aude Rousseau

aude.rousseau@au.pwc.com
+61 2 8266 0822

Canada

Jason Boggs

jason.boggs@ca.pwc.com
+1 416 941 8311

China

James Chang

james.chang@cn.pwc.com
+86 (10) 65332755

Eurozone

Burkhard Eckes

burkhard.eckes@de.pwc.com
+49 30 2636 2222

Colin Brereton

colin.brereton@uk.pwc.com
+44 (0) 20 7213 3723

France

Rami Feghali

rami.feghali@fr.pwc.com
+33 15657 7127

Italy

Pietro Penza

pietro.penza@it.pwc.com
+39 6 57083 2158

Japan

Jan Muranga

jan.muranga@jp.pwc.com
+81 80 134 72227

Singapore

Chris Matten

chris.matten@sg.pwc.com
+65 6236 3878

Spain

Adolfo Perez Escobar

adolfo.perez.escobar@es.pwc.com
+61 2 8266 0822

South Africa

Johannes Grosskopf

johannes.grosskopf@za.pwc.com
+27 (0) 11 797 4346

United States

Shyam Venkat

shyam.venkat@us.pwc.com
+1 646 471 8296

www.pwc.com/financialservices

This publication has been prepared for general guidance on matters of interest only and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, PwC does not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it.

© 2014 PwC. All rights reserved. In this document, "PwC" refers to the UK member firm, and may sometimes refer to the PwC network. Each member firm is a separate legal entity. Please see www.pwc.com/structure for further details.