Feedback Statement

05/2

Financial Services Authority

Stress Testing

Feedback on DP05/2

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FSA®

Contents

This Feedback Statement reports on the main issues arising from Discussion Paper 05/2 – Stress Testing and publishes final rules.

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1 Stress testing: overview

For the purpose of brevity, we use the term 'stress testing' throughout this Feedback Statement (FS) to describe both stress testing and scenario analysis. We give fuller definitions of these terms in Annex I.

1.1 In May 2005, we published Discussion Paper (DP) 05/2: Stress Testing. The DP set out the main findings of two surveys we carried out in 2002 and 2003 into the form and nature of stress testing undertaken by a number of banks, securities and insurance firms. We did this to establish the extent to which firms were using tests and to understand the level of integration of such testing into firms' risk-management frameworks. The DP also incorporated the conclusions of a workshop held with a small group of firms in February 2005 to explore the use of stress testing as a risk-management tool. The firms involved in this workshop were a sample of larger and more complex firms, including banks, insurers and major infrastructure providers.

1.2 The DP had four other objectives:

- To outline, as a contribution to the debate about good practice, a model for embedding stress testing into the risk-management framework of firms including ensuring senior management engagement in the process (a 'comprehensive approach').
- To highlight our intention to engage in a constructive discussion with the larger and more complex firms on their use and development of stress testing.
- To provide a briefing document for a conference on stress testing we held in September 2005. This conference discussed the development of specific stress testing methodologies and facilitated discussions between firms and us on their key risks.

- To gain input from firms which could be used in further reviews to explore improvements in the use of stress testing by larger and more complex firms and to develop detailed views of what constitutes good practice.

1.3 In this Feedback Statement, we summarise the comments received to the questions posed in the DP and our responses to them. We also set out our proposed next steps to monitor firms' development of stress testing in line with the proposals set out in the DP. In considering our responses, we have also taken into account the themes drawn from the conference we held in September.

2 Summary of responses

2.1 We are encouraged to note that respondents to the DP and participants at the conference in September generally agreed that:

- stress testing should form an integral part of a firm's risk-management framework;
- senior management should be fully engaged in a firm's stress-testing processes; and that
- improved stress-testing methodologies within firms, particularly within the larger and more complex institutions, would strengthen the overall stability of the financial system.

2.2 Most responses to the DP emphasised that there is no appetite for additional formal guidance or new rules to be issued on stress testing, beyond those likely to be required by the implementation of the Capital Requirements Directive (CRD) or currently imposed on insurers by the Individual Capital Adequacy Standards (ICAS). This point was re-iterated by participants at the conference. The ICAS, which came into force from 1 January 2005, require all life and general insurance firms individually to assess their capital needs. Our rules also require life and general insurance firms to conduct stress tests that are appropriate to the nature of any major risk identified (PRU 1.2.35). In addition to these requirements, we issued guidance in December 2004 for banks, building societies, insurance companies and own account dealers for conducting stress testing on liquidity risk (PRU1.2.35).

2.3 Where we have already explicitly defined and articulated requirements for stress testing within our Handbook, some respondents asked for greater clarification and guidance on those requirements.

2.4 The larger and more complex firms were keen for us to maintain a dialogue with them on stress-testing developments and, more generally, respondents were keen for feedback on good practice within the industry.

2.5 We asked firms' about the need to broaden and/or deepen the coverage of their stress testing of risk elements. In general, respondents thought that firms should be allowed to develop their own stress-testing methodologies relevant to the particular risks run by each firm. Firms saw aggregating risks as a worthwhile longer-term objective.

2.6 Where stress testing within firms remains less developed and less embedded within established risk-management practices, responses to the DP indicated a preference for us to adopt a less formal approach. Respondents felt that the future implementation of the CRD and the existing requirements of the ICAS are sufficient catalysts for firms to develop appropriate stress tests.

2.7 We give detailed responses to the questions posed in the DP and the main themes to have arisen from the conference on stress testing held in September in section 3. We have considered these responses and our proposed course of action is in Section 4.

3 Responses to questions in DP05/2

3.1 We received a variety of responses to the DP and informal feedback from the participants of the conference held in September 2005. We are grateful to all those who commented on the proposals and to those who contributed to the conference. We give a list of the non-confidential respondents to the DP in Annex 2 and a schedule of the major groups which participated at the conference is in Annex 3.

> Q1: In relation to risk management and in particular scenario analysis, are there other areas – beyond the identification of key extreme but plausible risks – where firms feel dialogue with us would be beneficial?

3.2 There was a general consensus from respondents that further dialogue between the FSA and industry would be welcomed, particularly on the extreme but plausible scenarios identified by firms for their aggregated stress tests.

3.3 Some respondents felt that there are areas beyond extreme but plausible risks which firms should focus on. Whereas stress testing for credit institutions tends to focus on short-term normal risk measurement techniques, insurance firms traditionally stress catastrophic events, as normal losses are provided for by technical reserves.

Our response: The conference on stress testing explored the definitional issue of extreme but plausible risks and there was general agreement that firms were best placed to identify such risks given the particular risk profiles, markets and environmental factors that they were subject to. It was agreed also that firms are best placed to determine the stress tests most appropriate to their own risk profile. We will therefore not set specific scenario analyses for firms but will continue to use and develop scenarios for our own work (e.g. for our planning, as published in the Financial Risk Outlook).[1]

1 The Financial Risk Outlook is published annually by the Financial Services Authority. A copy of this publication can be found on the FSA web-site, www.fsa.gov.uk

We agree that further work to identify and share good practices surrounding stress testing is desirable. We are proposing to undertake reviews of stress testing methodologies within larger and more complex firms from the first quarter of 2006 and the findings of these reviews will be promulgated more widely in a Dear CEO letter in the third quarter of 2006. This letter will also reinforce our expectations and share good practice. In terms of aggregation of risks, it was recognised at the conference that the development of such techniques remains at a formative stage. We will monitor developments through our stress-testing reviews of larger and more complex firms and will report back on good practice.

Q2: Do firms broadly agree with our analysis of stress testing coverage – which is based on the sample of firms involved in our stress testing work to date – as representative of the extent and nature of stress testing in larger and more complex firms?

3.4 Responses to the DP and discussion at the conference indicated a broad consensus that our description of stress-testing practices – as described in the DP and set out in the matrix at Appendix 4 – is a broadly accurate representation of the extent and nature of stress testing in larger and more complex banks and securities firms.

3.5 Feedback from the conference suggested that industry practice in relation to market risk stress testing is more advanced than that for other risk types. Many firms are continuing to develop the methods they have in place. In particular, firms told us that the output from stress testing is being used to improve the specification and implementation of the tests concerned. It was noted that in designing stress tests, more firms are using historical experience to inform hypothetical scenarios, rather than simply using past events. There is a range of practice in terms of the time horizons over which market risk stress tests are conducted. Some institutions focus on plausible losses over a one-to-five year timeframe, whereas others pay more attention to extreme events. Some firms are making progress in incorporating market liquidity risk in their stress tests. Two common approaches include extending holding periods for illiquid assets, or applying add-ons to historical price changes.

3.6 For credit risk, current practice varies between firms. Key challenges are the availability of data for past periods of stress and the need to support and inform stress tests by qualitative discussions within the firm. It was considered helpful for heads of business units to be engaged in identifying key risk drivers and assessing risk appetite. Also, scenarios should be credible and comprehensible so that senior management/boards could be more readily engaged.

3.7 On aggregated risks, it was noted that significant obstacles to developing effective methodologies remained. These were not limited to technological issues. Difficulties arise from different time horizons across risk elements (e.g. market risks tend to crystallise quickly, whereas crystallisation of credit risk tends to be much slower). Secondly, credible data are not available for firms to perform aggregated stress tests across risk elements. For example, to come up with a credible picture of potential losses arising from operational risks, firms are pushed to examine judicious combinations of (stressed) loss distribution analyses and (stressed) judgemental scenarios.

3.8 There was a general sense from respondents that it would have been useful for the stress testing of insurance risk to have been discussed in greater depth in the DP. This is accepted by the FSA. However, the introduction of ICAS from 1 January 2005 has served as a useful prompt to insurance companies to develop their stress-testing practices and we have already gained significant information on these practices through assessing individual ICAS methods[2].

Our response: The stress-testing conference provided an opportunity for all firms, including insurance companies, to explain the current state of development of stress testing across all sectors. We will be conducting a series of thematic reviews starting in the first quarter of 2006 to enhance our knowledge of current practices and to develop our understanding of the breadth and depth of stress testing in larger and more complex firms. This will include an assessment of how advanced firms are in terms of embedding the various characteristics of the 'comprehensive approach' into their risk-management frameworks. Anecdotal evidence from the conference suggests that a considerable amount of work still needs to be undertaken in order for firms to implement the comprehensive approach and so they can aggregate risks. It appears that the extent and sophistication of stress testing within firms' risk management practices are evolving at different paces.

Q3: In improving the coverage of stress testing, should the priority be for firms to 'broaden' their stress testing by increasing the risk types they cover first, or 'deepen' their stress testing by looking at more complex scenarios and the aggregation of risks?

3.9 There was a general consensus that we should not be seen to be prescriptive in pushing firms to broaden or deepen the coverage of their existing stress testing. Respondents argued that the existing requirements of the ICAS and the likely requirements of the CRD for stress testing will be appropriate and sufficient and will, over time, broaden firms' approaches in relation to the stress testing of risks relevant to a particular firm. On the issue of aggregating risks, some respondents noted that they needed to do more quantifying of individual risk elements before they could aggregate them and they said firms

2 In November 2005, we published a paper *'Insurance Sector Briefing: One Year On'*, giving feedback from our operation of the new Individual Capital Adequacy Standards (ICAS) regime for insurance companies.

should be allowed to develop and quantify their own testing of existing (relevant) risk elements. More generally, aggregation of various risks was seen as a longer-term objective.

3.10 The need to broaden the coverage of risks posed to insurance firms was recognised as a first step before they consider more complex scenarios of risks captured by existing models. Once achieved, it would then be possible to deepen the tests carried out, particularly through stochastic modelling.

3.11 In their responses to the DP and at the conference, firms alluded to certain obstacles in performing stress tests of aggregated risks. Most notable was the cost of collecting and developing a time series of data to perform stress tests. Furthermore, inadequacies of information systems, the multiplicity of systems used by larger and more complex firms and the difficulties in building models to a degree of sophistication where multiple variables for each risk group can be calibrated and then re-calibrated compound the practicalities of running such simulations.

Our response: We do not propose to be prescriptive in our approach to setting stress-testing requirements for firms. Within the constraints imposed by the requirements of the CRD and ICAS, firms should determine their own strategies for designing and developing stress-testing methods relevant to their firm's risk profile. We will continue to challenge the appropriateness of stress tests undertaken by firms and will incorporate reviews of these tests into our ARROW risk-assessment framework.

Q4: Do the various characteristics of the 'comprehensive approach' capture the main elements that larger and more complex firms think need to be addressed in the governance of stress testing?

3.12 There was broad endorsement both from respondents to the DP and at the conference that the various characteristics of the 'comprehensive approach' set out in the DP captured the main elements that need to be addressed in the governance of stress testing. Senior management of firms were particularly supportive of the FSA taking a proactive approach to setting the broad criteria for senior management's role in this respect, but were keen for us not to be prescriptive. The need to maintain flexibility for firms to delegate appropriate responsibility for stress testing within their management hierarchy was also recognised.

3.13 Senior management noted that stress testing was only one of many tools that are employed within a firm's risk-management framework and that it was important not to over-emphasise the role of stress testing. Boards are inevitably focused on what can cause a firm to fail and, although stress tests play an important role in that process, there are many other factors (such as business contingency) which senior management need to take into account.

Our response: We are pleased to note that the various characteristics of the 'comprehensive approach' have received broad endorsement. We acknowledge the need to apply these characteristics flexibly to accommodate the particular risk profiles and management structures of individual firms. But we shall expect to see all firms, particularly the larger and more complex institutions, move towards incorporating the principles of the comprehensive approach within their risk-management frameworks. For those firms subject to our risk assessment process, we shall assess the integration of stress testing within their risk-management processes as part of the normal ARROW process.

Q5: Do firms support the approach described to address the development of stress testing by firms within the current business context, or are there any suggested amendments or enhancements?

3.14 Respondents to the DP and the participants at the conference were broadly supportive of our approach to the incremental development of stress testing by firms. They emphasised the need for individual firms to be allowed to embed stress testing in a way that is appropriate for the risk profile of each firm.

3.15 Respondents asked us for more clarification of how ARROW firm assessments, thematic visits and policy work will fit together. They also asked us to clarify the timing of the CRD requirements.

Our response: As noted above, we do not propose to be prescriptive in our approach to the setting of stress-testing requirements for firms. Within the constraints of the CRD and the requirements of ICAS, firms should determine their own strategies for designing and developing stress testing methodologies relevant to the risk profile of their firm. Further guidance on the stress testing requirements of the CRD will be issued for consultation in the first quarter of 2006. The existing ARROW methodology is also currently being revised. The revised approach will integrate firm reviews with thematic work and will accommodate the requirements of ICAS and, in due course, the requirements of Pillar II, including stress testing. The revised risk-assessment method will be published in the first quarter of 2006, with a more lengthy paper of additional guidance in the second quarter of that year.

Q6: Would additional formal guidance on stress testing be helpful or are firms content with the current programme (which consists of conferences, thematic visits with firms, supervisory focus and the publication of information, such as Dear CEO letters)?)

3.16 Overall, firms responded in favour of the current programme as opposed to additional formal guidance. However, respondents were keen to receive further guidance on the stress-testing requirements of the CRD, when finalised, and asked us to publish evidence of good practice where identified.

Our response: Section 4 of this FS sets out the approach we propose to adopt to further the development of stress testing by firms in the UK. We will monitor the development of stress-testing methods by credit institutions and investment firms in the lead up to CRD implementation through thematic reviews and the ARROW risk-assessment framework. We will use the ICAS framework (incorporated within ARROW) for monitoring the development of stress testing by insurance companies. As noted, within the legislative constraints of the CRD requirements, we do not propose to be prescriptive in setting rules or guidance on the form of stress tests that firms should run. However, if the findings of our thematic work, ICAS and firm assessments reveal significant shortcomings on progress in the area of stress testing, we will consider implementing additional formal guidance in this area.

4 Next steps

Issuance of further guidance on CRD – February 2006

4.1 The key international development which will have a direct influence on future stress testing requirements for credit institutions and investment firms is that of Basel II and the CRD, which will give effect to Basel II in the UK and the rest of Europe.

4.2 We set out details of proposed CRD stress-testing requirements earlier in 2005 in CP05/03 and issued a Feedback Statement in September. We have been working closely with industry expert groups to draw up additional guidance on the practical implications for firms of the stress-testing requirements of the CRD. We envisage issuing a further CP on CRD implementation in February 2006, which will set out this additional guidance. Beyond the requirements of the CRD, we aim not to be prescriptive in imposing additional stress testing rules and guidance on firms.

4.3 The detailed implementation of the stress testing requirements of the CRD is uncertain. Despite this, we are fully expecting firms to make use of the period leading up to its implementation in 2007 to improve both the development of stress-testing methods relevant to their risk profiles and to embed stress testing more firmly into their risk-management frameworks.

Thematic reviews of larger and more complex firms – from Q1 2006

4.4 We are proposing to undertake a series of thematic visits to a selection of firms starting near the end of the first quarter of 2006 to examine existing practice of their firm-wide stress testing. The aim will be to establish not only current practice but also what is planned or projected within those firms, what is realistically achievable and what is good practice. The firms selected will be a representative sample, including a small number of broker dealers, some investment banks, asset managers, banks and building societies. At this stage, we do not propose to include insurance companies as we have already gained significant information on their stress-testing practices through the ICAS process.

Dear CEO letter - third quarter of 2006

4.5 One main output of these thematic reviews will be a Dear CEO letter, probably in the third quarter of 2006, setting out the findings of the reviews, our expectations of future developments in the light of the CRD and the sharing of good practice. This will include constructive practical suggestions on technical issues.

On-going assessment of stress-testing methods through the risk-assessment framework

4.6 We expect all credit institutions, investment firms and insurance firms to develop their coverage of stress testing in a manner appropriate to the risk profile of each firm.

4.7 For those firms subject to our ARROW risk-assessment process, we shall assess the appropriateness of the stress tests that are being carried out, having due regard to the scale, nature and risk profile of each business. We will also assess through the ARROW process the extent of senior management and business heads' engagement in firms' stress-testing processes and the extent of integration of stress testing within each firm. Through the ARROW process, we intend to open a dialogue with firms to understand more clearly the key extreme but plausible risks included in stress-testing exercises and scenarios.

4.8 We have planned to change the existing ARROW process in early 2006. These changes will integrate firm reviews with thematic work and accommodate the stress-testing requirements of the ICAS. When finalised, the stress testing requirements of the CRD will also be integrated within the revised risk assessment framework. The revised assessment methodology will be published in the first quarter of 2006, with a more lengthy paper of additional guidance in the second quarter of that year.

4.9 As stated above, we do not propose to be prescriptive in setting rules or guidance in the area of stress testing (beyond those already imposed by the ICAS and CRD), but will periodically review whether it is appropriate to introduce specific guidance if evidence from ARROW assessments and thematic reviews indicate that developments are insufficient.

Stress testing and the Financial Stability Joint Forum[3]

4.10 The Joint Forum has undertaken to do further work on stress testing for publication in the year ahead.

3 The Joint Forum is a group of experts, working under the umbrella of the Basel Committee on Banking Supervision, the International Organisation of Securities Commissions and the International Association of Insurance Supervisors. The Joint Forum was set up in 1996 to look at areas of common interest in the banking, insurance and securities fields.

Definition of stress testing

We have used the following definitions for terms in this paper:

Stress testing typically refers to shifting the values of individual parameters that affect the financial position of a firm and determining the effect on the firm's business. Scenario analysis typically refers to a wider range of parameters being varied at the same time. Scenario analyses often examine the impact of catastrophic events on a firm's financial position, for example simultaneous movements in a number of risk categories affecting all of a firm's business operations – such as volumes, investment values and interest rate movements.

Scenarios generally could also be considered under three broad categories. For example, changes to the firm's business plan, scenarios that involve changes in business cycles and those relating to extreme events. Firms can derive the scenarios in a variety of ways – by using stochastic models, analysing historic experience or repeating a historical event. Scenarios can be developed with varying degrees of precision and depth.

List of non confidential respondents to DP05/2

Acadametrics

Artemis Investment Funds Ltd

Bonnier Business Information Ltd

British Bankers' Association

Friends Provident

International Underwriting Association

Investment & Life Assurance Group

Investment Management Association

London Investment Banking Association

Corporation of Lloyd's on behalf of Council of Lloyd's

Royal & Sun Alliance Insurance Group plc

Zurich Financial Services (UKISA) Limited

List of major groups at the Stress Testing Conference in September 2005

Abbey

ABN AMRO Asset Management Ltd

Allied Irish Bank

Alliance & Leicester

Aviva

Bank of America

Barclays Bank Plc

Bear Stearns

BGC Partners

BNP Paribas

Britannia Building Society

Calyon

Cantor Fitzgerald

CIS Ltd

Citigroup

Co-operative Financial Services

CSFB

Deutsche Bank Group

Dresdner Kleinwort Wasserstein

Fortis Bank

Goldman Sachs International

HBOS

HSBC

ICAP

ING Bank NV

Investec Bank UK Ltd

Kas Bank

Legal & General Group Plc

Lehman Brothers

Lloyds of London

Lloyds TSB

Merrill Lynch

Morgan Stanley

NAB Group

Nationwide Building Society

Nomura International Plc

Norwich Union Life

Royal Bank of Canada

Societe Generale

Standard Bank

Standard Chartered Bank

The Bank of New York

The Co-operative Bank

UBS

WestLb

Zurich Financial Services

Matrix characterising our findings about firms' current use of stress testing

Stress Test	Stress Testing					Correlation	
	Market	Liquidity	Credit	Operational (Basel definition)	Other	Market/ Credit	Other
Single variable ↓ Multi Variable ↓ Complete scenarios							
Aggregated across the firm	Often	Often	Rarely				

The 'Comprehensive approach'

Good practice has stress testing forming an integral part of a firm's risk management framework. Senior management may decide to delegate the performance of stress testing to a firm's risk management department. However, they must be involved in determining the relevant stresses and have a clear understanding of the implications of any outputs on the business. Changes to risk appetite, capital allocation and changes to direction in a firm's strategy may follow from these outputs.

At the workshop we held in February 2005, and in the conference in the following September, a set of characteristics for integrating stress testing into a firm's risk management framework were discussed. The characteristics found broad support amongst industry participants (particularly for larger and more complex firms). In summary, the characteristics of this good practice 'comprehensive approach' are:

- senior management will be able to identify and articulate a firm's risk appetite and understand the implications of stress events within this context;
- senior management will take an active part in identifying potential stress scenarios;
- outputs from stress testing will be communicated to senior management in a comprehensible format;
- senior management will have an overview of firm-wide risks and stresses and a concept of total risk even where precise aggregation is not possible;
- senior management will consider formally the implications of stress testing for a firm's strategy or business profile; and
- IT systems, resources and procedures will allow senior management to identify, quantify and manage efficiently the stresses that affect a group.

There is more discussion of this good practice approach in the Discussion Paper DP05/2: Stress Testing[4].

4 A copy of Discussion Paper DP05/2: Stress Testing can be found on the FSA website, www.fsa.gov.uk

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