Consultation Paper

# 08/24**

Financial Services Authority

# Stress and scenario testing

December 2008

FSA®

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The Financial Services Authority invites comments on this Consultation Paper. Comments should reach us by 31 March 2009.

Comments may be sent by electronic submission using the form on the FSA's website at (www.fsa.gov.uk/Pages/Library/Policy/CP/2008/cp08_24_response.shtml).

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# 1 Overview

## Introduction

1.1 Stress and scenario testing should form a key part of a suite of tools used by a firm's senior management in making integrated business strategy, risk management and capital planning decisions. Recent market events have shown the importance of strong governance in firms. Senior management at less affected firms had more successfully established comprehensive firm-wide risk assessment processes in which thoughtful stress and scenario testing played a material part, allowing better-informed and more timely decision-making. However, our SREP[1] reviews of firms' Pillar 2 individual capital assessments, and broader work on stress and scenario testing arrangements, have indicated that for many firms stress and scenario testing is not as robust, nor as embedded in senior management decision-making, as we would like.

## Policy proposals

1.2 In this Consultation Paper, we set out proposed changes to our Handbook rules and guidance on stress and scenario testing.

### Reverse-stress test requirement

1.3 First, we are proposing to introduce a 'reverse-stress test' requirement, which would apply to banks, building societies, CRD investment firms and insurers, and would require firms to consider the scenarios most likely to cause their current business model to become unviable. Our aim is to ensure that firms more fully explore 'tail risks' which, if they were to crystallise, would cause counterparties and investors to lose confidence in them, so that a firm is more aware of its business model vulnerabilities when making strategic business decisions, when contingency planning, and when considering its risk management arrangements. This is a holistic requirement which, in addition to any risks to a firm's capital position, requires firms to consider other relevant risks, including liquidity risks.

1 Supervisory Review and Evaluation Process

1.4 Our proposal to introduce a reverse-stress testing requirement should not be interpreted as indicating that we are proposing a 'zero failure' policy. We have long explained our view that such a policy is neither possible, nor desirable. In addition, consistent with the provisions of the Financial Services and Markets Act 2000 (FSMA), we continue to recognise the importance of 'innovation in connection with regulated activities' and of 'competition between those who are subject to… regulation'. We recognise that innovation, by its very nature, involves risk and uncertainty. But an underlying aim of the reverse-stress test requirement would be to ensure that a firm could survive long enough after risks have crystallised either to restructure its business, or to permit a more orderly wind-down or transfer of business.

### Risk-based capital

1.5 Second, we are proposing to make some drafting changes to our existing requirements on Pillar 2 capital stress and scenario testing (our ICAAP[2] provisions), or where firms use internal models to assess their Pillar 1 capital requirements. These are intended to clarify our current policy and address recommendation 3.6 of the internal audit report into our supervision of Northern Rock[3].

1.6 Our proposed changes to prudential rules and guidance relevant to ICAAP (ICAS) provisions are not intended to change the regulatory benchmark confidence level for firms' Pillar 2 capital assessments. However, they do signal that many firms need to strengthen their capital planning to ensure a more comprehensive assessment of their material risks and any planned mitigating actions, and our view that many firms have previously been over-optimistic in evaluating the severity and impacts of adverse scenarios.

## Purpose of this Consultation Paper

1.7 The proposed changes to our Handbook on which this CP consults are intended to better reflect the importance that we attach to robust stress and scenario testing and clarify our expectations of firms. Planned changes will affect our provisions on 'Senior Management Arrangements, Systems and Controls' (SYSC) and our prudential sourcebooks. In addition, we offer industry-wide feedback on conclusions from our ICAAP reviews to date, as well as EU and international work on stress and scenario testing.

1.8 We encourage firms to review their existing stress and scenario testing arrangements and to start to identify where improvements can be made even ahead of finalised Handbook changes. This CP should be seen as part of a broader programme of planned actions – first, firms can expect to experience increased supervisory focus and challenge in these areas; and second, we are intending to establish a related industry forum to facilitate discussion and the development of good practice, which will build on recent seminars that a number of banks have participated in.

2 Internal Capital Adequacy Assessment Process provisions which are set out in our Prudential Sourcebook under which a firm is required to self-assess adequate financial resources to cover its particular individual risks.

3 *The Supervision of Northern Rock: a lessons learned review*, FSA Internal Audit Division, March 2008 – Appendix 2, Recommendations and Actions (www.fsa.gov.uk/pubs/other/recommendations.pdf)

## Questions

1.9 We have invited responses to a number of questions. We set these out within the relevant chapters and we list them all in Annex 1.

## Audience

1.10 This paper should be of interest to banks, building societies, Capital Requirements Directive (CRD) investment firms and insurers. Smaller investment firms may find Annex 2 helpful in understanding our proposed scope of application for the reverse-stress test. In addition, insurers may find Annex 3 a helpful guide to how our proposed changes will apply to them.

1.11 The industry-wide feedback offered in this CP (Chapter 2) is primarily based on findings from SREP reviews we have conducted to date of BIPRU firms' ICAAP submissions. Our recent Insurance Sector Briefing[4] offered similar feedback to insurers. While some messages are sector specific, there are nevertheless also some common high-level themes for all constituencies: firms need to be more imaginative and thoughtful in their stress and scenario testing, and it should be better embedded in integrated senior-management decision-making.

## Structure of this paper

1.12 *Chapter 2:* Market Failure Analysis, summary cost-benefit analysis and context for Proposed Changes. This chapter contains our detailed analysis of the rationale for prudential regulation, the place of stress and scenario testing within this and our analysis of the costs and benefits of our proposals. We also comment on recent market events and offer some feedback on stress and scenario testing based on both our own work and broader international work.

1.13 *Chapter 3:* Proposed changes to Handbook rules and guidance. Here we outline our proposed changes to Handbook rules and guidance, including the reverse-stress test, which will form part of our Senior Management Arrangements, Systems and Controls (SYSC) requirements. Other amendments are proposed to our GENPRU, BIPRU and INSPRU rules and guidance.

1.14 *Annex 1:* Complete list of consultation questions.

1.15 *Annex 2:* Application of reverse-stress testing to smaller investment firms.

1.16 *Annex 3:* Key messages for insurers.

1.17 *Annex 4:* Cost-benefit analysis of our proposed Handbook amendments.

1.18 *Annex 5:* Statement on compatibility with our objectives and the principles of good regulation.

1.19 *Appendix 1:* Draft Handbook text.

4 Insurance Sector Briefing: Risk and capital management update, FSA, September 2008 (www.fsa.gov.uk/pubs/other/isb_risk_update.pdf)

## Next steps

1.20 This CP should be read alongside other relevant FSA papers: first, we have published a CP on liquidity requirements for banks, building societies and full-scope CRD investment firms[5]; second, we have published a CP on banking reform[6]; and third, we have set out our intention to publish a more general DP on reform of prudential requirements for BIPRU firms in Q1 2009.

1.21 The forthcoming DP arises from a request from the Chancellor of the Exchequer for us to review the lessons to be learned from the global financial crisis and to outline our views on the changes that are likely to be necessary in terms of both domestic and international regulatory frameworks. Although our stress and scenario testing CP is not formally part of this review, its objectives are fully consistent with it.

1.22 When the UK bank recapitalisation package was agreed on 8 October, the Tri-partite authorities imposed a prescriptive stress test on affected institutions to determine the appropriate level of capital for each. This framework used common benchmarks of capital to risk weighted assets (total tier 1 capital of at least 8%, and core tier 1 of at least 4% in the stressed scenario) to ensure broad consistency between different institutions. Our statement of 14 November[7] notes that this test was applied in a specific context and was not intended to set new minimum capital ratios. This topic will be addressed in our Q1 2009 DP and our stress and scenario testing CP does not cover it, therefore.

1.23 In Chapter 2 of this CP, we outline the wide range of recent and ongoing work on stress and scenario testing in wider European and international forums, including in the Basel Committee[8], CEBS[9], IAIS[10] and the Financial Stability Forum. We are actively engaged in this broader work. Our renewed supervisory focus on stress and scenario testing will build on previous work that we have done with FSA regulated firms and our CP proposals are intended to ensure our policy is broadly consistent with emerging international and EU recommendations. In taking forward our stress and scenario testing policy, we will be informed both by respondents' feedback on the proposals in this CP, and any evolving Basel and CEBS recommendations.

1.24 Firms and other stakeholders are invited to respond to the questions in this CP; the period for comment runs until 31 March 2009.

5 *CP08/22: Strengthening Liquidity Standards*, FSA, December 2008. This CP does not propose specific quantitative or reporting requirements for insurers, for which liquidity risks are generally less material. A general requirement for insurers to consider liquidity risks remains part of the ICAS provisions.

6 *CP08/23: Financial stability and depositor protection: FSA responsibilities*, FSA, December 2008

7 FSA Statement on Capital Approach Utilised in UK Bank Recapitalisation Package, 14 November 2008

8 The Basel Committee on Banking Supervision

9 Committee of European Banking Supervisors

10 International Association of Insurance Supervisors

## Consumers

1.25 This paper is important for consumers because our prudential requirements and high-level standards (SYSC) for BIPRU firms and insurers are a means of achieving our consumer protection objective and changes to these requirements therefore have potential impact on consumers. Firms are required to undertake stress and scenario testing for risk-management purposes, to assess the adequacy of financial resources and in making contingency plans against potential adverse circumstances.

# 2 Market failure analysis, summary CBA and context for proposed changes

## Introduction

2.1 This CP proposes changes to our current Handbook rules and guidance on stress and scenario testing. We have committed to undertaking market failure analysis (MFA) and cost-benefit analysis (CBA) when proposing new Handbook rules and guidance. We consider the MFA and CBA together to help ensure that the regulatory intervention that such new requirements represent:

- addresses an identified market failure; and
- an overall net benefit, taking into account costs and benefits to all relevant stakeholders.

2.2 In this section, we explore the rationale for prudential regulation of financial firms and the imposition of stress-testing requirements on firms as part of this. We note the real costs that have been evident from the recent financial failure of some firms. In addition, firms that fared better in difficult circumstances tended to have stronger governance arrangements in place, as senior management had established more comprehensive, firm-wide risk assessment processes. For these firms stress and scenario testing formed part of a suite of tools that aided the firm's senior management in its task of identifying, assessing and managing risk. The full cost-benefit analysis for the specific policy proposals that we make is set out in Annex 4 and this MFA should be read alongside the considerations set out there.

2.3 The general economic rationale for prudential regulation was explored in *Occasional Paper Series 1*[11]. This noted that: 'regulation for systemic reasons is warranted when the social costs of failure of financial institutions exceed private costs and such potential costs are not incorporated in the decision-making of firms. Firms may therefore be induced into more risky behaviour than they would if all risks (including those for the system as a whole) were incorporated in their pricing'. In addition to systemic considerations the paper notes that 'there is a case for prudential regulation of financial firms when:

11 *Occasional Paper 1, The Economic Rationale for Financial Regulation,* FSA, April 1999

- the institution performs a fiduciary role;
- consumers are unable to judge the safety and soundness of institutions at the time purchases or contracts are made;
- post-contract behaviour determines the value of contracts, and when the institution may become more risky because of a change in its behaviour after a long-term contract has been taken out by consumers; and
- there is a potential claim on an insurance fund or compensation scheme because the costs of hazardous behaviour of an individual financial firm can be passed on to others (those who in the end pay financial compensation). If, for instance, other firms in the industry are required to pay the compensation liabilities of failed institutions (as in the UK) it would be reasonable for these firms to demand certain minimum standards of behaviour which they are unable to enforce themselves without an external agency's intervention.'

2.4 For these reasons, our Handbook of rules and guidance contains provisions relevant to the prudential regulation of financial firms. These include provisions that set out how a firm should assess the capital necessary to cover the risks that it is currently exposed to, but our Handbook also contains relevant provisions on business and capital planning, corporate governance and systems and controls.

2.5 Our Handbook currently includes a requirement for firms to undertake stress and scenario testing. Stress and scenario testing is used by firms for Pillar 2 purposes, when they are assessing their individual capital requirements. In addition, deposit takers and CRD investment firms that use more advanced approaches (e.g. internal models for market or credit risk) for Pillar 1 are also subject to more specific stress and scenario testing requirements. More generally, stress and scenario testing is a tool that firms use to help them to identify, assess and manage risks arising from the business they conduct.

2.6 Stress and scenario testing is an important tool for firms' prudential risk-management. In particular, it can be useful to a firm's senior management decision-making by:

- enabling them better to shape the risk profile of the firm through a better understanding of the risks the firm is exposed to;
- helping to provide a more forward-looking assessment of risk, as a complement to other risk management tools, and helping to overcome the limitations of reliance on historical data;
- helping to evaluate the impact of extreme events which may result in significant losses;
- helping to identify risk concentrations across multiple business lines or units;
- enabling them better to integrate business strategy, risk management and capital planning decisions; and

- providing a framework which supports a firm's internal and external communication.

2.7 Our view is that the need for robust stress and scenario testing that is integrated into a firm's senior management decision-making has generally materially increased over recent years, as a result of the changes in firms' business models and the increase in structured products with complex risks.

2.8 An important consideration in MFA and CBA is recognition that any identified market failure is only addressed, and any identified net benefit of associated regulatory requirements is only realised, when firms adequately implement the relevant regulatory requirements.

2.9 In this CP we propose changes to our existing Handbook requirements on stress and scenario testing. These are intended to address market failures which resulted in:

- the failure of some firms that pursued business plans (business models) that became unsustainable as wider market and economic conditions changed, with consequent wider costs to society; and
- the need for a number of financial firms to raise additional capital at a time of low market confidence and the difficulties and increased costs that some experienced in doing so (leading in some cases to the need for the government to intervene to provide additional capital).

2.10 Broadly speaking, our reviews of firms' stress and scenario-testing arrangements to date, our SREP reviews to date, and lessons emerging from recent events have led us to conclude that:

- many firms' current stress and scenario testing arrangements are not as robust, nor as embedded in senior-management decision-making as we would like;
- there is some confusion and uncertainty amongst firms about our current stress and scenario testing requirements in an ICAAP context, with the consequences that (as they may not be adequately implemented):
    - o the identified ICAAP (or more generally, prudential regulation) CBA benefits may not be achieved in practice; and
    - o firms may incur additional costs arising from the need to make multiple ICAAP submissions before ICG is agreed.
- It is desirable to introduce a new requirement for firms explicitly to identify and assess the scenarios most likely to cause their current business plan to become unviable. In this context, a firm's business model should be assumed unviable at the point that crystallising risks cause the market to lose confidence in it, with the consequence that counterparties and other stakeholders are unwilling to transact with it or provide it with capital. We intend introducing this new requirement to encourage firms to: explore more fully the vulnerabilities of their business model (including 'tail risks'); make decisions that better integrate business and capital planning; and improve their contingency planning. An

underlying objective would be to ensure that a firm can survive long enough after risks have crystallised for one of the following to occur:

- the market decides that its lack of confidence is unfounded and re-commences transacting with the firm;
- the firm down-sizes and re-structures its business;
- the firm is taken over, or its business is transferred in an orderly manner; or
- public authorities take the firm over, or wind down its business in an orderly manner.

2.11 As a result, we believe that improved stress and scenario testing arrangements at firms should help both to reduce the probability of firms failing, and also the consequent impact and wider costs of any financial failure.

Q1: What is your view of our analysis of the market failures?

## Summary cost-benefit analysis

2.12 Our full cost-benefit analysis is in Annex 4 of this paper. We present a summary of that work here.

2.13 First, we estimate that the total cost to those firms[12] that will be subject to the reverse-stress testing requirement will be approximately £65 million. Investment firms are estimated overall to face the highest costs although this reflects more the larger number of firms, rather than a much higher cost per firm.

2.14 The reverse-stress test is a tool intended to enhance risk management within a firm. The benefit of a reverse-stress test is expected to arise from a more informed view of a firm's risks, to both the firm and the FSA, and the management consideration of any action to mitigate those risks.

2.15 We are also proposing amendments to both Pillar 1 and Pillar 2 stress-testing policy, which will be reflected in our Handbook rules in GENPRU[13], BIPRU[14] and INSPRU[15]. However, these changes represent a clarification of existing policy requirements and are not intended to represent additional requirements on the part of BIPRU firms and insurers.

Q2: What is your view of our cost-benefit analysis?

12 We estimate that there will be approximately 4,000 such firms – BIPRU firms, excluding BIPRU 50K firms with less than £1bn funds under management, and insurers.

13 General Prudential sourcebook (applicable to Banks, Building Societies, CRD Investment Firms and Insurers)

14 Prudential sourcebook for Banks, Building Societies and Investment Firms

15 Prudential sourcebook for Insurers

## Recent market events and feedback on stress testing

### Introduction

2.16 Recent market events have highlighted the importance of stress testing within banks and other financial services organisations. There are several key themes in the initial lessons learned from recent market turmoil:

- Senior management involvement: It is essential that senior management are involved in overseeing a comprehensive and coordinated stress and scenario testing programme. Governance, resourcing and methodology (including ongoing review) are all important for achieving high quality and relevant stress and scenario analysis. Senior management engagement is a necessary condition for integration of stress testing into business, risk and capital decisions and encourages more thorough exploration of tail risks as well as milder adverse scenarios.
- Contagion: It is important for firms to pursue more thorough analysis of risk transmission and contagion mechanisms (including ripple and reinforcing effects from a primary stress scenario extending to other markets or products) and also to better reflect how risk correlations may vary in stressed conditions.
- Firm-wide holistic view: Firms should be able to conduct stress and scenario testing that helps them identify and assess risks at a firm-wide level. A firm's stress testing programme should be holistic in terms of risk capture and coverage. A firm needs to be able to carry out stress testing at different levels (for example also at business unit, or business line, level) and to bring together top-down and bottom-up risk assessment in a coherent manner.
- Liquidity stresses: Contagion from a liquidity stress situation in one market may spread across multiple markets, and as well as affecting firms' liquidity positions may ultimately also expose firms to capital stresses, including those arising from pipeline transactions which cannot be distributed as planned in conditions of decreased demand, and off-balance sheet exposures which are re-assumed.

### Development of recent events

2.17 The last year has been eventful for the financial markets and high volatility has been a dominant feature. The precursor to the current market conditions was a period of strong global economic growth and a high level of savings emerging from Asian economies, particularly China, and the big oil producers. Exchange rate policies resulted in a large proportion of these savings taking the form of foreign exchange reserves, which were invested in fixed-income instruments, such as US Treasuries. This high level of savings combined with apparent asset preferences led to an extended period of very low real risk-free interest rates in developed economies. Financial firms' access to cheap funding and their broader search for sources of yield were conditions that fuelled, among other things, high retail sector borrowing in the US and the UK, but also in other countries. This included a rapid expansion of mortgage credit, often on dangerously relaxed lending standards (including to US so-called sub-prime borrowers). Financial innovation in structured products, notably development of securitisation technologies and their markets and the shadow

banking sector (e.g. structured investment vehicles (SIVs) and conduits) facilitated the development of the so-called 'originate and distribute' model. However, the complexity of some of these products, financial firms' hunt for yield, and the resultant lack of transparency about who was exposed to which risks led ultimately to asset valuation difficulties and more general uncertainties about the credit-worthiness of financial counterparties.

2.18 The US sub-prime crisis quickly sparked a broader reappraisal of risk including a dramatic dislocation in structured credit markets. Lack of liquidity and a re-pricing of credit risk have led to financial firms deleveraging and have revealed a connectedness that was hitherto insufficiently appreciated. Firms have suffered from several mutually reinforcing factors:

- the effects of chronic contractions of supply of credit and liquidity;
- the erosion of their capital due to a collapse of asset prices;
- increased capital and liquidity requirements resulting from the need to retain risks on balance-sheets or to support off-balance sheet vehicles;
- credit rating downgrade feedback effects (e.g. collateral triggers linked to ratings downgrades); and
- more generally sustained high volatility and high correlations in financial markets.

2.19 In the summer of 2007, the securitisation markets and other wholesale funding channels were significantly diminished, leading to liquidity problems for many banks. LIBOR[16] spreads increased dramatically as banks hoarded cash and were reluctant to lend to each other. There was significant uncertainty around the value of impaired and illiquid assets and which firms were holding them. To maintain their reputation some banks took back onto their balance sheets instruments that had been previously transferred to SIVs. As the year went on, banks were forced to write-down many of their exposures related to mortgage-backed securities. The focus of these write-downs was initially on US subprime, but it soon widened to other asset classes and geographies. Monoline insurers providing financial guarantees also came under stress, as some firms suffered significant increases in loss estimates and negative rating agency actions.

2.20 The subsequent developments in the real economy include rapid falls in residential and commercial property prices and a significant contraction in overall economic activity.

2.21 The following section draws out some of the lessons learned from these events and proposes how stress testing methodologies and processes should be strengthened to help make the risk management of financial services firms more robust for the future. These findings are not focused purely on the stress testing practices of UK-based firms, but also draw on relevant international work. Indeed, our intention is partly to highlight findings from the wider international community that may be helpful in alerting UK firms to areas in which they can better establish stress testing within their risk-management framework. Our findings have been drawn from

16 LIBOR is the London Inter-Bank Offered Rate – the rate at which banks lend to each other over a given time period.

published material such as the Senior Supervisors' Group[17] report and the recent industry recommendations prepared by the Institute of International Finance (IIF)[18] and the Counterparty Risk Management Policy Group III (CRMPG III)[19] . We have also drawn upon firms' ICAAP submissions and contact with the industry through various private and public forums, including a series of stress and scenario testing seminars run jointly by the Bank of England and us.

## Feedback

2.22 It is hard to draw together definitive industry-wide lessons learned while the market is still volatile and in a downturn. It may be some time, beyond the current business cycle before market participants can fully assess the impact of recent market events and what way to ensure firms are better able to weather a crisis in future.

2.23 Many firms noted that their stress tests were not fit for purpose as they were not designed for the type of extreme market event that occurred. Firms' stress tests failed to consider adequately the magnitude of shocks, duration of the shock, risk concentrations and the extent of correlation (and contagion) between different positions, risk types and markets. Furthermore, firms' stress tests did not adequately flex their dependency on liquid capital markets (i.e. asset liquidity) for managing, distributing, and hedging risk. Historical statistical relationships (normal market assumptions including rules of thumb) did not hold true during the recent market turbulence.

2.24 There was an over-reliance on historical data in designing stress tests in the past which, amongst other failures led to an underestimation in the magnitude of market moves, did not adequately capture tail events and failed to capture the systemic nature of the crisis. Firms now consider it important to build in a more hypothetical set of assumptions for how exposures may change in light of unexpected shocks. Further significant investments in IT infrastructure are likely to be required at many firms to provide risk information that is sufficiently granular in order to construct a comprehensive firm-wide view of stress testing.

### FSA review work

2.25 Through our review work we find that stress testing for traded assets tends to be well established both at desk level and across their aggregate trading positions. However, the stress testing undertaken has not always been effective. For example, the holding period and the duration of the stress are often very short and take little account of the possibility of extended periods of market disruption such as conditions witnessed over the last year. Furthermore, the implementation of these stress tests fails to take into consideration the correlations and co-dependencies of the firms' risks and positions beyond those in their trading books.

17 *Observations on Risk Management Practices during the Recent Market Turbulence,* Senior Supervisors Group, March 2008 (www.newyorkfed.org/newsevents/news/banking/2008/SSG_Risk_Mgt_doc_final.pdf)

18 *Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations,* IIF, July 2008 (www.iif.com/press/press+75.php)

19 *Containing Systemic Risk: The Road to Reform,* The Report of the CRMPG III, August 2008 (www.crmpolicygroup.org/docs/CRMPG-III.pdf)

2.26 Our experience in reviewing firms' ICAAP submissions[20] suggests that firm-wide stress testing, which aims to capture the impact of cross-market and cross-risk type dependencies on the assets of the firm as a whole, is at an early stage of development. The focus of these firm-wide approaches is often on the impact of macroeconomic downturn scenarios that evolve over a number of years in order to support the firm's strategic planning process. Due to the slow-burning and high-level expression of such macroeconomic events, they usually assume liquid markets continue to exist and there is no impediment on the ability to trade assets or raise capital.

2.27 The recent market turmoil has forced firms to reassess the level of severity that they regard as plausible. Nevertheless, the stress tests presented in firms' ICAAP submissions have not yet gone so far as to significantly challenge their underlying business models. This recent experience and the events surrounding Northern Rock also raised the question of whether firms should be expected to search for scenarios which threaten their continued viability as going-concerns and to carry out 'reverse-stress tests'. The emphasis of a 'reverse-stress test' would be on identifying the high impact stress events which would cause the firm to fail and considering the appropriate action, if any, to protect against such failure. It is in this context that we are proposing to introduce a requirement for firms to undertake a reverse-stress test in Chapter 3. The CRMPG III report makes a similar recommendation for firms to carry out a 'reverse-stress test where the emphasis is on the contagion that could cause a significant stress event to the firm'. Our proposal is for a reverse-stress test that is broader than that envisaged by the CRMPG III. However, this industry recommendation illustrates that reverse-stress testing is seen as a useful risk management tool for firms.

## Lessons learned

### Senior management engagement and governance

2.28 Senior management involvement is critical to the effectiveness of any stress-testing programme. Observations published in the Senior Supervisors' report found that firms that already had a high degree of management involvement before the market turmoil performed better during it. Senior management buy-in and involvement is essential in defining scenarios, discussing results, assessing potential actions, and in constructing an effective governance framework to ensure the quality of stress testing and scenario analyses.

2.29 Before the recent market turmoil, a particular challenge to risk managers was in obtaining senior management and business-line acceptance of more severe scenarios. Too extreme or innovative scenarios were often regarded as implausible by senior management. Furthermore, senior management was more interested in moderate scenarios with a reasonable likelihood of occurring over the next three to five years. This is because they felt that they could actively manage these events while public authorities would step in during market-wide, severe scenarios. There is some evidence arising from contact with firms that senior management involvement and

20 ICAAPs are submitted by banks, building societies and CRD investment firms

buy-in has increased significantly over the period of market turbulence, and that stress tests are playing a much greater role in business management.

2.30 Senior management engagement and buy-in is also important to ensure adequate consistency and control around the stress testing methodology, and is a necessary condition for the full integration of stress testing into risk and capital decision-making processes. It is also important to ensure that firms are robustly exploring severe scenarios. This engagement should include a framework to ensure thorough challenge and regular review processes around all aspects of the governance and methodology.

2.31 An essential part of the governance process is that firms have a thorough understanding of scenario drivers and its rationale and relevance to the business. Stress scenarios may often be fairly abstract in composition making it difficult to understand true drivers/sensitivities in a real stressed scenario. Stress test scenarios should be intuitive yet capture significant complexity in order to more accurately reflect behaviour in distressed markets. Scenarios are likely both to change and evolve and to vary in importance compared to other scenarios over time. It is therefore important for the stress testing methodology to facilitate frequent yet controlled review and amendment to ensure stresses are up-to-date.

### Contagion

2.32 Current practice in stress testing often makes reference to historical worst-case market events. However, this approach embeds implicit assumptions regarding the direction of market movements and their correlations. Furthermore, high-level, non-granular, assumptions are made about the behaviour of broad asset types, without consideration of the true nature of dynamics in distressed conditions. The result, as highlighted by the collapse of the subprime market, is a failure by firms to fully capture correlation and contagion dynamics in their composition of stress tests.

2.33 Firms should capture contagion effects by considering what potential knock-on events might reasonably arise in stressed conditions for which there is little or no historical precedent. Such 'hypothetical' scenarios should form part of an overall stress testing programme that comprises both historic and hypothetical scenarios. Although these hypothetical scenarios should be informed by historical data, they will invariably involve significant expert judgement.

### Firm-wide holistic view

2.34 A further key lesson learnt from recent events is that firms should aim to achieve a firm-wide, holistic view of their risks. Their stress-testing programme should involve complete and thorough capture and coverage of risk to a sufficient level of granularity to ensure an appropriate level of understanding of how a firm's risk will evolve in any distressed environment. In addition to considering key sources of risk, firms should consider less obvious sources of risk. Risks that are often inadequately captured in stress testing include, but are not limited to: the behaviour of complex products under stressed liquidity conditions; basis risk in relation to hedging strategies; pipeline or warehousing risk; contingent risks; and funding liquidity risk.

2.35 Firms may often be severely constrained in their stress testing by a lack of granularity in their data and in their reporting systems. A stress testing programme should continually seek to improve the risk coverage, capture and quality of data. In addition, stress-test methodologies themselves can introduce extra elements of risk through the assumptions they impose. For example, many firms use bands and groups of risk within their stress testing which introduce (amongst other risks) additional basis risk. When constructing stress tests, proper consideration should be paid to what (risk management) incentives are encouraged or discouraged by stress testing. The challenge for firms is to integrate a comprehensive range of stress tests into a more complete picture of their firm-wide risks. Firms should endeavour to integrate the desk-level view with the broader firm-wide perspective, taking account of the impact of stresses that may lead to contagion effects across the whole industry.

### Liquidity

2.36 Finally, recent events have highlighted the importance (and associated difficulties) in considering liquidity in distressed markets. Liquidity has shown itself to be a mechanism by which contagion from a stress situation in one market may spread across the whole market, and so becomes the source of the systemic shock itself. Recent events have highlighted the importance of:

- Stress scenarios that feature the (catastrophic) release of asset price bubbles. These would likely entail narrowly focused shocks, directed on specific markets or asset types, but which are of such severity and duration that there is contagion to other markets and the sudden drying up of liquidity or a sudden closure of a particular market.
- Liquidity as a mechanism by which contagion from a stress situation in one market may spread across the whole market, and so therefore become the source of the systemic shock itself. This may ultimately expose firms to capital stresses, including: pipeline transactions that cannot be distributed as planned due to decreased demand; and off-balance sheet exposures which are re-assumed.
- The inter-linkages between capital and liquidity. Firms need to capture liquidity effects, for example by considering scenarios of varying duration (10 days, 30 days, 90 days and so on). Less liquid positions should be analysed to understand what drivers would cause them to become illiquid in distressed markets and to design appropriate mitigating actions accordingly. Appropriate data should be analysed and used where appropriate to indicate liquidity constraints relevant to a particular firm.

## Supervisory stress testing initiatives

2.37 This consultation builds on a body of previous work that we have undertaken on firms' stress and scenario testing. In particular, the theme of senior-management engagement has been one that we have consistently promoted as being central to firms' stress and scenario testing programmes. We summarise that work below.

Moreover, recent market events have led to further consideration of stress and scenario testing both at a European Union and wider international level. This consultation aims to build on that work too, particularly that of the Risk Management and Modelling Sub-Group (RMMG) of the Basel Committee on Banking Supervision (the Basel Committee).

### FSA

2.38 We have been actively promoting improvements in stress testing practices over a number of years. Our 2005 Discussion Paper (DP05/2) set out the benefits of effective stress testing and described a 'Comprehensive Approach' (the Approach) to stress testing developed in conjunction with the industry. A key feature of the Approach is a high level of involvement by senior management at the key stages of the overall stress testing process.

2.39 We followed this up with a 'Dear CEO' letter to banks, building societies and CRD investment firms in 2006[21], which reported on a review of how stress testing practices at 10 major firms met the standards of the Approach and gave examples of good practice. This letter reiterated that we expected to see all firms, particularly the larger and more complex institutions, moving towards incorporating the principles of the Approach within their risk management frameworks.

2.40 The need to improve stress testing practices was also a major theme of our Financial Risk Outlook (FRO) in both 2006 and 2007. In the former, as well as noting shortcomings against the standards of the Approach, we pointed out that, despite the low volatility at that time, it was important for firms to evaluate how they would react to extreme risk scenarios. Some examples were given of scenarios that firms might find it helpful to evaluate, including a reappraisal of risk by the market.

2.41 This work has been supplemented by SREP reviews that we have undertaken as part of the ICAAP process for banks, building societies and CRD investment firms and the ICAS process for insurers. Some feedback on our ICAAP work can be found in Chapter 3, whilst we have recently published an insurance sector briefing outlining feedback on stress and scenario testing from reviewing insurers' ICAs. We have also recently jointly hosted a series of seminars for banks with the Bank of England.

### International Regulatory Authorities

2.42 Internationally and in the EU, banking supervisors have also been focusing on stress testing practices and we have been fully engaged in these efforts. Much of this work has been related to the implementation of Basel 2, mainly but not exclusively, on the use of stress testing in the internal-ratings based (IRB) approach to credit risk and/or Pillar 2. The work has looked at expansion on that framework's high-level standards for stress testing, which were published in 2001 and have remained largely unchanged since that time. This led to the Committee of European Banking Supervisors (CEBS) publishing guidelines on stress testing (GL03[22]) in December 2006.

21 *Stress testing thematic review,* October 2006 (www.fsa.gov.uk/pubs/ceo/stress_testing.pdf)

22 CEBS' guidelines: 'The Application of the Supervisory Review Process under Pillar 2'. (www.c-ebs.org/getdoc/00ec6db3-bb41-467c-acb9-8e271f617675/GL03.aspx)

2.43 International groups of supervisors have also been considering stress testing as part of the work of the Basel Committee on Banking Supervision (the Basel Committee). They have focussed more on sharing ideas and best practice amongst supervisors rather than publishing public documents. This output of these groups has included:

- a subgroup of the Committee's Research Task Force working on a project on industry practices in stress testing infrequently traded credit portfolios over 2007-08; and
- the Committee's Accord Implementation Group report on supervisory experiences of implementing the Pillar 1 and Pillar 2 stress testing requirements, and an agreed set of supervisory expectations in this regard.

2.44 More recently work has focused on the market turbulence that commenced in the summer of 2007:

2.44.1 The Senior Supervisors' report identified weaknesses in stress testing practices as one of the factors that contributed to losses incurred by particular firms during the recent market turbulence, as part of their review of firms' risk-management practices.

2.44.2 The Financial Stability Forum (FSF) included strengthened stress-testing guidance for risk management and capital planning purposes, and the need to ensure that capital buffers are sufficient for risks through the cycle, amongst its recommendations to the Basel Committee and national supervisors in its Report on Enhancing Market and Institutional Resilience in April 2008.

2.44.3 The Basel Committee announced a number of measures in response to the FSF's recommendations, also in April 2008. These included the intention to issue guidance on Pillar 2 stress testing and capital planning processes. As part of this initiative, the Committee has asked its Risk Management and Modelling Sub-Group (RMMG) to produce a study on the range of practices of the industry during the period of turbulence. This is expected to be published in December 2008. The proposals in this CP are intended to be consistent with the guidance emerging from this process.

2.44.4 Recommendations on improvements in stress testing practice have also appeared in complementary private sector initiatives – most notably the IIF's response to the market turmoil of 2007-2008, which was published in July 2008. The key recommendations from that report are outlined below.

2.44.5 For insurers, the International Association of Insurance Supervisors has been addressing the FSF recommendations. In October 2008, the IAIS adopted standards and guidance for insurers on enterprise risk management for capital adequacy and solvency purposes and the use of internal models for regulatory capital purposes. "Stress testing by Insurers" guidance has been in place since October 2003, expanding

on Insurance Core Principle 10. It recommends that capital adequacy and solvency regimes should be supplemented by a focus on firms' risk management systems. At the European level, the proposed Solvency 2 Framework Directive includes stress testing as part of an insurer's own risk and solvency assessment.

## Industry recommendations for stress-testing

2.45 This section of the paper summarises the industry recommendations described in the 'Final Report of the IIF Committee on Market Best Practices: Principles of Conduct and Best Practice Recommendations'. We fully support such industry-led initiatives.

2.46 IIF members found that during the recent market turbulence, the magnitude of losses at many firms made it clear that their stress-testing methodologies needed refinement. In summary, the IIF recommendations with respect to stress testing are:

- Firms should make stress testing part of the management culture. This should include reinforcement of procedures to promote active discussion between senior management and risk management as to the tests to be performed, the scenarios to be tested and their implications for the firm.
- Firms should ensure that their stress-testing methodologies are consistently and comprehensively applied throughout the organisation. Account should be taken of both on and off balance sheet exposures, including pipeline and warehousing risks (e.g. with respect to securitizations and leveraged loans). Further, the stress tests should take both group-wide views as well as business and entity-specific views. The stress-testing methodologies should be designed to deal adequately with risk concentrations.
- Stress testing should play an integral role in assessing the bank's risk profile in relation to its risk appetite across all business activities, risk types and exposures. Stress testing methodologies should be actively used to complement and explicitly address the limitations of other risk-management tools, including Value at Risk. Stress testing should be used to explore the assumptions and identify the limitations of models used for pricing and risk modelling.
- Stress testing should include challenging scenarios and should be designed so that the likelihood of severe events is not consistently underestimated and the bank's ability to manage crises in an effective and timely manner is not overestimated.
- Finally, the IIF warn that stress testing should not be seen as a perfect, single-metric solution: results should be taken into account in decision making but such output should be used thoughtfully and not made automatic.

# 3 Proposed changes to Handbook rules and guidance for stress and scenario testing

## Introduction

3.1 Our SREP reviews of firms' ICAAP and ICAS submissions, along with broader work on stress and scenario testing, as noted in Chapter 2, have shown us that firms' arrangements are not as robust and embedded in senior-management decision-making as we would like. In addition, it is evident that some firms are unclear about our expectations of them as regards stress and scenario testing. One of the key recommendations of the FSA's internal audit review of our supervision of Northern Rock[23] (the NR report) was that the FSA should 'increase its focus on prudential supervision, including…stress testing'. In particular, the NR report recommended with regard to stress testing that the FSA should:

- re-confirm the approach to stress testing taken following its 2006 thematic review, including the decision not to add further Handbook rules or guidance; and
- consider the case for amendment of the Handbook to make it easier to understand the body of material on stress testing and how its parts fit together.

3.2 Recent market events and those surrounding Northern Rock in 2007 have also shown that several firms' business models were particularly susceptible to specific risks.

3.3 The options available to us, following a review of our Handbook rules and guidance in respect of stress and scenario testing, were to:

- retain our current Handbook rules and guidance, but not to update or clarify them;
- include a number of prescribed scenarios within our Handbook rules; or
- amend and clarify our rules and guidance in a more principles-based way, including introducing a new high-level 'reverse-stress test' requirement for a firm to analyse its business model vulnerabilities and to identify the scenario(s) most likely to cause its business models to become unviable.

3.4 Based on our work with firms, the NR report recommendation and our view that stress and scenario testing is becoming increasingly important as firms' structures

23 *The Supervision of Northern Rock: a lessons learned review,* FSA Internal Audit Division, March 2008 – Appendix 2, Recommendations and Actions (www.fsa.gov.uk/pubs/other/recommendations.pdf)

and risks increase in complexity, we are proposing to follow the third option: clarifying our existing requirements in a principles-based way and adding a new high level reverse-stress testing requirement.

3.5 Our current Handbook has various stress testing provisions that are relevant to firms in different contexts:

- first, there are provisions covering the use of stress and scenario testing as part of the general process of risk identification, assessment and management in firms;
- second, there are GENPRU provisions relevant to the use of stress testing and scenario analysis to estimate financial resources under ICAAP in the circumstances and events being considered. These apply to banks, building societies, CRD-scope investment firms and insurers;
- third, there are various BIPRU provisions that set out specific stress testing requirements for banks, building societies and CRD investment firms that use more advanced approaches to assess their Pillar 1 capital (for example, firms that use internal models to assess credit risk or for trading-book market risk); and
- fourth, insurers may use stress and scenario testing to assess current capital adequacy when performing their ICAs (INSPRU 7).

3.6 In developing our proposals, our intention has been to:

- emphasise the importance of stress and scenario testing as a tool for identifying and assessing risks at the firm-wide level. In particular, stress and scenario testing is one of a suite of tools that are relevant to senior management's responsibility to understand and manage the firm's risks, and to make suitably integrated business strategy, risk management and capital planning decisions; and
- introduce better 'signposting' so it is clearer how our various provisions on stress and scenario testing relate to one another.

3.7 BIPRU firms should note that, in addition to this CP, which covers our proposals on reverse-stress testing, and clarifications on the role of stress testing when firms are assessing their capital resources requirements (ICAAP), our Liquidity CP[24], contains proposals on the role of stress and scenario testing when assessing liquidity requirements.

3.8 As part of our review, we considered whether we should introduce to our Handbook prescribed stresses and scenarios that firms would be required to test. Our Handbook already requires BIPRU firms to project their capital through an economic recession of a severity such as might be experienced once in 25 years. But it does not set out, for example, what equity, interest rate and credit stresses should be applied to meet this requirement.

3.9 We have decided to maintain a more principles-based approach (with high-level requirements and supporting guidance) and not to introduce further prescription for three reasons. First, further prescription undermines the principle of senior

24 *CP08/22: Strengthening Liquidity Standards*, FSA, December 2008

management responsibility – it is for firms to identify their most material risks and scenarios that are appropriate to their business and risk profiles. Second, it would be difficult to keep scenarios up to date, or relevant to a diverse range of firms. Indeed, this latter point was made in the Senior Supervisors report[25], which noted that 'stress tests themselves should be dynamic – such that they consider new scenarios as business conditions evolve'. And third, detailed prescription in Pillar 2 would potentially duplicate, or conflict with, Pillar 1. However, we are proposing several drafting changes to clarify our existing requirements and we have included more specific guidance on a number of issues.

3.10 It is likely nevertheless to remain the case that, from time to time, we will – potentially in conjunction with the Bank of England – wish to ask groups of firms to test the impact of a prescribed scenario on their financial position. This approach can provide useful information about the resilience of the system as a whole, or particular business sectors, to a given shock. Firms may also wish to consider how such prescribed shocks compare with those used in their reverse and capital stress testing.

### Industry involvement in considering scenarios

3.11 We intend to maintain an increased focus on stress and scenario testing and consider that there should be an appropriate high-level industry forum for stress and scenario testing. So, we propose to hold a regular industry forum to discuss the sorts of stresses that firms should be considering. This forum would be chaired by a member of our senior management.

## Proposed changes to FSA policy

### Reverse-stress testing of a firm's business-model vulnerabilities

3.12 We are proposing to introduce to our Handbook a new requirement for a firm explicitly to identify and assess the scenarios most likely to cause its current business plan to become unviable. In this context, a firm's business plan should be assumed unviable at the point that crystallising risks cause the market to lose confidence in it, with the consequence that counterparties and other stakeholders are unwilling to transact with it or provide capital to the firm and, where relevant, that existing counterparties may seek to terminate their contracts. Recent experience suggests that such a point may be reached well before a firm's regulatory capital is exhausted.

3.13 The intention behind the introduction of this new requirement is to encourage firms: first, to explore more fully the vulnerabilities of their current business plan (including 'tail risks' as well as milder adverse scenarios); second, to make decisions that better integrate business and capital planning; and third, to improve their contingency planning. In the case of "common platform firms" the reverse-stress test requirement elaborates the MiFID-derived requirements on risk control in SYSC

25 *Observations on Risk Management Practices during the Recent Market Turbulence,* Senior Supervisors Group, March 2008

7.1.2R to 7.1.7R. The proposed requirement is intended to be holistic, so firms should consider liquidity risks as well as risks to their capital positions.

3.14 An underlying objective would be to improve consumer protection and market confidence by ensuring that a firm can survive long enough after risks have crystallised for one of the following to occur:

- the market decides that its lack of confidence is unfounded and re-commences transacting with the firm;
- the firm down-sizes and re-structures its business;
- the firm is taken over, or its business is transferred in an orderly manner; or
- public authorities take over the firm, or wind down its business in an orderly manner.

3.15 As a result, it is our view that adequate stress and scenario testing arrangements at a firm should help both to reduce the probability of its financial failure of a firm and the consequent wider impact and costs of any financial failure by making any wind-down or re-structuring orderly.

3.16 The process of identifying and analysing adverse scenarios that, if they were to occur, would cause a firm's business model vulnerabilities to crystallise should include a consideration of the likelihood or remoteness of such risks arising in practice.

3.17 The introduction of a reverse-stress test requirement should not be interpreted as indicating that we are now pursuing a 'zero-failure' policy. We have long explained our view that such a policy is neither possible, nor desirable. In addition, we continue to recognise the importance of 'innovation in connection with regulated activities' and 'competition between those who are subject to…regulation' as set out in the Financial Services and Markets Act 2000 (FSMA[26]); and we recognise that innovation by its very nature involves risk and uncertainty.

3.18 But in circumstances where reverse-stress test results reveal that a firm's existing business model poses an unacceptable risk to our statutory objectives (in particular those relating to market confidence and the protection of consumers) we will consider what action might be appropriate.

3.19 It is an existing feature of our supervisory ARROW[27] process that supervisors assess the risks inherent in a firm's business model; the emerging risks to the firm that may be posed by wider environmental and market conditions; and the adequacy of a firm's capital and risk controls to support the firm's intended business. Where our supervisors judge that a firm poses a risk to the achievement of our statutory objectives, they have a wide range of regulatory tools at their disposal to help mitigate the risk. The tools used in individual cases may vary according to the probability of a risk crystallising and its impact. So any action taken may differ according to the severity of the identified risk and the nature of the firm's business, but may commonly include requiring a firm to rectify identified systems and

26 FSMA is the legislation that gave us our statutory powers.

27 ARROW is our Advanced Risk-Responsive Operating Framework, which is designed to identify the main risks to our statutory objectives as they arise and to help us plan how to address these risks in line with our regulatory approach.

controls weaknesses and issuing individual capital guidance (ICG). In more serious cases we may impose requirements on a firm's permission or even vary (limit) a firm's permitted regulatory activities using powers conferred by Part IV of FSMA.

3.20 Introducing a reverse-stress test requirement is not intended to change our ARROW approach. However, firms can expect to experience an increased supervisory focus on stress and scenario testing. We consider that information from the implementation of the reverse-stress test requirement will be a useful complement to ICAAP stress and scenario analyses for both firms and us.

3.21 The introduction of the reverse-stress test requirement does not change the regulatory benchmark confidence level for firms' Pillar 2 capital assessments. For insurers, ICAS requirements in INSPRU require firms to assess the adequacy of their capital, including an assessment comparable with a confidence level of 99.5% over a 1 year timeframe. In addition, GENPRU provisions require insurers to project their capital resources, capital resources requirements and financial adequacy over a time horizon of 3-5 years, based on their business plan and taking account of an appropriate range of adverse variations around the base case.

3.22 Deposit-takers and CRD investment firms are also required by GENPRU to project their capital resources over 3-5 years and to estimate financial resources needed to withstand the impact of a cyclical downturn (including, in the case of BIPRU firms with an IRB permission for credit risk, the impact of a recession of 1/25 years severity). Such a downturn may address a firm's predominant risks where the majority of its business is composed of non-trading book activities. But BIPRU firms are additionally expected to meet BIPRU requirements including holding capital to withstand specified yield curve shifts where they are exposed to banking book interest rate risk, and more sudden, severe market events that may be particularly pertinent to trading-book risks.

3.23 When supervisors are discussing reverse-stress testing with firms they are likely to consider, amongst other things, the extent and quality of senior management involvement. In particular, senior management may be expected to provide appropriate input and challenge to the identification of relevant scenarios, and to discuss the results of testing with a view to giving a high-level steer on any appropriate consequent actions.

3.24 We expect reverse-stress testing to provide useful input (considering also other relevant sources of information) to senior management decision-making in the following areas:

- A firm's business strategy, including pre-identification of trigger points for review and revision of strategy.
- Firm-wide risk tolerances, including the setting of risk limits and risk review triggers across business units and business lines.
- Capital and liquidity planning: notwithstanding our Pillar 2 requirements as specified in GENPRU, BIPRU and INSPRU, a firm may nevertheless identify certain low probability but high impact scenarios that it would wish to survive; or there may be capital consequences arising from any business restructuring

envisaged as a result of 'Doomsday' scenarios. In addition, focusing on variations around the most likely ruin scenarios may help a firm to identify Pillar 2 capital stress test scenarios. It may also help a firm better to understand the sensitivity of its capital and liquidity positions to different stress calibration assumptions.

- Hedging and other risk mitigation strategies.
- Contingency planning.

3.25 In identifying events which might cause a firm's business model to become unviable, a firm should consider whether it has a material exposure to liquidity risk, as well as risks that may affect its capital position. Where liquidity risk is material, we would expect to see analysis of a scenario which has a primary effect on a firm's liquidity (which may or may not have an impact on capital) and also an analysis of a scenario where a loss of capital undermines confidence in a firm and has a secondary impact on its liquidity. Firms should have regard to the origins of liquidity risk and the drivers set out in our Liquidity CP. Our Liquidity CP proposes a requirement for a firm to self-assess adequate liquidity resources so it would be able to withstand a variety of potential liquidity events; in contrast, the reverse-stress requirement in this CP proposes that a firm should consider what sort of a liquidity event could cause the firm's business model to become unviable.

3.26 Scenarios that may constitute business plan failure for a firm may differ from those that may constitute such failure for a group of which it is a member. Whereas the failure of a group is likely to be accompanied by the failure of a member firm, the opposite may not necessarily be true. Therefore, for a firm that is a member of a group, the reverse-stress test should be carried out on a solo as well as group basis.

3.27 We plan to include the reverse-stress test requirement in our Handbook in a new chapter of SYSC (SYSC 19), the part of our Handbook that sets out high-level requirements for senior management arrangements, systems and controls. This reflects the importance of reverse-stress testing to firms' high-level decision-making on business strategy and risk management as well as capital planning. We will expect a firm to document its reverse-stress testing and to be able to demonstrate that it has been signed off by its Board; and supervisors may seek to review it alongside a firm's Individual Capital Assessment (ICA/ICAAP) as part of the Supervisory Review and Evaluation Process (SREP).

3.28 The requirements that we propose to add to SYSC will be applicable to BIPRU firms and insurers. However, smaller BIPRU 50K investment firms (i.e. those with funds under management of less than £1 billion) will be excluded from the scope of this requirement.

3.29 While implementation of the reverse-stress test requirement should be proportionate to the nature, scale and complexity of a firm's business, compliance costs are often not fully scalable for smaller firms. BIPRU 50K investment firms do not take deposits, take positions, deal as principal, or hold client money. However, BIPRU 50K investment firms may have substantial funds under management. So, while smaller BIPRU 50K investment firms may pose limited prudential risks to our consumer protection and market confidence objectives, we consider it appropriate to explicitly

require larger BIPRU 50K investment firms to contingency plan for orderly run-off or transfer of business in the event that their business plan ceases to be viable.

3.30 All BIPRU 50K investment firms continue, nevertheless, to be subject to our Pillar 2 requirements (as they remain within the scope of application of the CRD). In addition, they remain subject to our MiFID-based high level requirements for 'common platform firms', including those relating to risk control (SYSC 7). So, notwithstanding our proposed scope of application, BIPRU 50K investment firms should consider whether reverse-stress testing has a role in meeting these obligations.

Q3: Do you consider our reverse-stress testing proposal reasonable?

Q4: To what extent are firms already undertaking reverse-stress tests? What is the involvement of senior management in the design and review of these tests? What further steps would firms need to undertake to carry out a reverse-stress test as outlined in these proposals?

Q5: Is it appropriate to exclude BIPRU 50K investment firms from the reverse-stress testing requirements if wind-down scenarios are an important part of their risk analysis? Given that our expectations would be based on a proportionate approach by smaller firms, would reverse-stress testing be resource intensive for BIPRU 50K investment firms?

## Clarification of Pillar 1 stress-testing policy

### Credit risk

3.31 Our current BIPRU rules[28] provide a high-level outline of stress testing expectations for firms using the internal ratings-based (IRB) approach for credit risk. While the impact of the specific requirement to test the effects of a once in 25 years economic recession is incorporated into an IRB firm's Pillar 2 capital assessment (see below), other stress tests are linked more directly with the IRB estimation process (and hence with the firm's Pillar 1 capital requirement).

3.32 Our proposals in this paper aim to clarify our guidance (BIPRU 4.3.39A G) to reflect the fact that stress testing should be used as a tool to increase confidence in the accuracy, or at least the conservatism, of the IRB parameters. This is because of the inherent problems in:

- measuring credit risk, as a result of a combination of often scarce historic data and inadequate understanding of estimated and/or actual default outcomes;

28 BIPRU 4.3.39 R

- exposure at default and loss given default data, which varies with the economic cycle; and
- the potential, more generally, for future outcomes to differ from past outcomes even where historic data is plentiful.

3.33 So our proposed changes include stating that, as part IRB quantification, we expect firms to use stress testing routinely as a tool in calibrating and/or validating the IRB parameters. As well as increasing the accuracy or conservatism of the estimates, this stress testing should include a thoughtful exploration of a wide range of outcomes that differ from the firm's normal expectations. This should give the firm a clear view of the potential for the forward-looking estimate to be different from that indicated by the primary data source(s) and this should be an integral part of a firm's quantification process. A firm should have clear standards for how the results of the stress tests affect the final estimates used for the IRB parameters.

Q6: Do you agree with our proposed clarification of the use of stress testing in IRB quantification?

## Credit risk mitigation

3.34 Our aim in making changes in this area is to ensure that our rules reflect the need for the overall effectiveness of the various types of credit risk mitigation to be assessed in stressed conditions. Noting the current structure of the Handbook and wishing to keep changes to a minimum, we believe this is best addressed under our 'Minimum requirements' (BIPRU 5.2.9R).

3.35 We also wish to strengthen requirements relating to 'The financial collateral comprehensive method: Own estimates of volatility adjustments approach: Quantitative Criteria' and propose that BIPRU 5.4.53R be amended to reflect the need for more than merely one stress to be considered.

3.36 Finally, based on our experience of working with firms, we have taken the opportunity to bring a little more clarity to our thinking in terms of stress testing as it relates to 'Calculation of the fully adjusted exposure value: the master netting agreement internal models approach'. So we are introducing guidance through a new BIPRU 5.6.19AG aimed at encouraging firms to reflect upon the simultaneous influence of individual stresses upon counterparty exposure, positions and the aggregate amount of margin calls. In addition, we are giving guidance on the possibility that liquidation periods may be extended.

Q7: Do you agree with our proposed clarification of the use of stress testing for credit risk mitigation purposes?

## Operational risk

3.37 The current BIPRU rules for Operational Risk (BIPRU 6) do not contain specific requirements for firms to undertake stress testing for Operational Risk. Nevertheless, AMA firms may use scenarios –

- As a means of inputting into the quantification of the amount of capital required for operational risk;
- As a check on the inputs, outputs and accuracy of risk models.

3.38 In addition, all BIPRU firms are required to have effective processes to identify, manage, monitor and report the operational risks they are, or might be, exposed to. These must be comprehensive and proportionate to the nature, scale and complexity of the firm's activities and a number of firms use scenarios as part of the process of meeting this requirement. We generally expect this practice to be evident amongst large complex firms.

3.39 In the operational risk arena "stress testing" tends to be understood by firms, and the FSA, as a requirement to examine extreme, but not implausible, scenarios. Scenario frequency or severity outputs used to provide AMA model inputs are stressed in some AMA models and, as part of the AMA calculation, are evaluated at a 99.9% confidence level.

3.40 We do not propose any additional stress testing requirements specifically for operational risk as we consider that the proposed clarification of the stress testing requirements in GENPRU and BIPRU will be sufficient. In addition, we do not intend to prescribe set scenarios as this will encourage firms to model stresses that we have provided instead of considering the risks that exist in their own risk portfolio.

3.41 When we discuss the use of scenarios and stress testing of operational risks with firms we will expect the firm to have taken full account of the GENPRU and BIPRU requirements and in particular to:

- Carry out stress tests and scenario analyses that are appropriate to the risks the firm is, or might be, exposed to;
- Determine the impact and frequency of the event, as well as the controls and risk mitigants the firm plan to use to manage the risks as well as any remedial action that is to be taken; and
- Comprehensively document the scenario and stress testing process, including recording scenarios, stresses applied, risk management options and outcomes, and management action taken.

Q8: Do you agree with our perception of the role of stress testing in operational risk and our proposal not to prescribe any additional stress testing requirements specifically for operational risk?

## Clarification of Pillar 2 stress testing policy

### Feedback on firm's performance of Pillar 2 stress testing

3.42 GENPRU 1.2.26R[29] requires firms to hold adequate financial resources and BIPRU firms and insurers must self-assess their capital under the "overall Pillar 2 rule"[30]. For insurers, the ICAS provisions set out in INSPRU 7.1 are relevant to meeting GENPRU 1.2.26R. For BIPRU firms various BIPRU provisions are relevant, including the requirement to assess interest-rate risk in the banking book and stress testing requirements for firms with IRB permissions for credit risk. However, in addition, BIPRU firms and insurers are subject to a more general stress testing requirement in GENPRU 1.2.42R.

3.43 GENPRU 1.2.42R requires firms to 'take reasonable steps to identify an appropriate range of realistic adverse circumstances and events' and to estimate the financial resources the firm would need as a consequence.

3.44 GENPRU 1.2.73G guides that a firm should, as a part of its obligations under 1.2.42R, project its financial position over, typically, a 3-5 year time horizon, so as to estimate both its capital resources and its financial adequacy throughout an economic or business cycle. For BIPRU firms with IRB permissions, assessing the impact of an economic recession of once in 25 years severity is relevant (BIPRU 4.3.39R).

3.45 While 1.2.42R imposes a general requirement, to date our SREP reviews of BIPRU firms' ICAAP assessments indicate that firms have typically focused on their most material risk (sometimes to the exclusion of other risk types): credit risk for banks and building societies; market risk for investment banks; and operational risk for fund managers.

3.46 One aim of GENPRU 1.2.73G is for firms and us to assess the potential procyclicality of their capital requirements under a macroeconomic downturn scenario and other relevant scenarios.

3.47 In practice, many BIPRU firms – not least since a condition of IRB use for Pillar 1 is the requirement to assess the effects of a once in 25 years economic recession – have responded to 1.2.73G by considering a simple re-run of the early '90's recession. In addition, in doing so, such firms often made the implicit assumption that liquid markets would continue to exist and contagion effects between firms and markets would not be material. As a result, for these firms, their implementation of the Pillar 2 stress testing requirement was of limited use in preparing them for more recent market events.

3.48 When a firm is projecting its available and required capital resources under the capital planning stress, the gross effects of the stress on the firms' position may be offset by the mitigating effects of any realistic management actions, to arrive at a net impact. A condition of this is that firms are required to seek Board sign-off of identified actions and to rehearse them so that they are better prepared if risks crystallise and they need to put the actions into effect. Based on our SREP reviews of BIPRU firms, this is currently one of the most under-developed aspects of their

29 The overall financial adequacy rule

30 GENPRU 1.2.30R

ICAAP submissions. We consider that all firms, including insurers[31], need to give further thought to the viability of proposed actions – including considering whether they would realistically be feasible in practice, taking account of wider market conditions in an adverse scenario and reputational effects. In addition, firms have proved to be over optimistic in assessing the degree of mitigation that proposed actions would achieve.

3.49 When, as part of the SREP, we review a firm's capital planning assessment we look to see how well integrated it is with the firms business planning processes. What is submitted to FSA should include a base case, based on the firm's expected business plan (including any new business), but should also include how the business plan would flex under adverse scenarios. As such, it should reflect changes in factors such as customer demand.

3.50 A firm's submission should show an analysis of the impact of the identified management actions in an adverse scenario, for example by showing the financial position both gross and net of management actions[32]. To enable us to make an adequate review of identified actions, firms must present granular, quantified information, including the timing of proposed actions. Examples of actions that firm's have proposed include raising new capital resources, capital injections from a parent, reducing capital distributions and ceasing to write new business.

3.51 Our SREP review is therefore based on both qualitative and quantitative factors, which are then reflected in the individual capital guidance (ICG) we give a firm as part of the SREP. Where there is a shortfall between a firm's current available capital and any net increase in its requirement over the time horizon, we discuss with the firm consequent action needed in order to ensure that they remain compliant with our requirement to have adequate financial resources.

3.52 In some cases, our experience has been that the capital planning stress included in a firms ICAAP submission has been undertaken solely for regulatory purposes and not integrated into firms' decision-making. However, we acknowledge that this is a relatively new field that will take time to embed, and firms continue to develop their frameworks to integrate stress testing into their risk-management processes.

## Handbook changes to clarify our expectations

### Higher level requirements

3.53 We intend to make it clearer that to comply with the overall Pillar 2 rule, firms must satisfy the general stress testing requirement set out in GENPRU 1.2.42R as well as (where relevant) provisions in INSPRU and BIPRU. We have therefore re-drafted 1.2.42R and clarified a number of the supporting items of guidance.

3.54 We consider that currently the interactions between 1.2.42R (general stress testing) and the additional guidance on stress testing and scenario analysis from GENPRU 1.2.63G to 1.2.78G, including 1.2.73G (capital planning stress), require further clarification.

31 See INSPRU 7.1.27G

32 We would expect the firm to articulate the impact on its capital resources and capital requirements as a result of these scenarios.

1.2.42R requires a firm to consider all its material risks, including those which are not adequately addressed by Pillar 1 capital requirements. 1.2.75G, on the other hand refers to a firm projecting its CRR[33] (Pillar 1 requirement). We propose to clarify our expectation that when firms carry out their capital projections they should project capital requirements based on capital needed to address all material risks to which they are exposed (including those which fall outside the scope of Pillar 1 and are assessed in Pillar 2), as well as the CRR. This should enable a firm to demonstrate that it will continue to meet the overall financial adequacy rule, as well as complying with minimum capital requirements.

3.55 The overall Pillar 2 rule requires firms to assess the necessary capital required to adequately support the material risks to which the firm is exposed. A firm may be exposed to sudden severe market or credit events followed by a longer-term economic recession (as we are currently witnessing). In addition, a firm may be exposed to concentrations of risk across business lines or across banking and trading book activities. We propose to make it clearer that firms should consider how risks may combine, and 'ripple effects' where an initial stress event subsequently leads to wider-ranging stress scenarios (GENPRU 1.2.42R).

3.56 We do not prescribe whether such assessments are made by considering integrated scenarios or by combining the results of separate stress tests. However, where, for example, a firm were to assess a market risk scenario and a credit risk scenario separately our presumption would be that the firm should hold capital against both risks. This is because these risks can be highly correlated in times of stress. Where a firm presents a suite of scenarios, they must include a commentary on how these inter-relate.

3.57 We have also included additional text with the intention of providing further clarity to firms on appropriate mitigating management actions. (GENPRU 1.2.73AG) Such actions can be considered in devising the stress test outcomes net of management actions, although we will continue to request gross stress test outcomes as well where this is helpful in analysing the impact and feasibility of those actions. We note that reliance on overseas parents of subsidiary undertakings to commit to downstream funds on request is only likely to be deemed credible in exceptional circumstances, for example if there is clear legal certainty that such transfers would take place in times of stress.

3.58 We are proposing some amendments to BIPRU 2.2 to emphasise the requirement that BIPRU firms should (where relevant to their business) consider a range of market shocks (both instantaneous and more extended) as part of their stress testing. Insurers also assess market shocks as a part of the ICAS provisions, but we are not proposing changes to those.

3.59 BIPRU provisions make it clear that when a firm is assessing the effects of an economic recession it should be a recession of a severity such as is experienced once in 25 years. We are proposing changes to GENPRU 1.2.42R to apply this standard more generally to other economic or business cycles considered as part of the capital planning stress.

33 Capital Resources Requirement

3.60 We are also proposing amendments to BIPRU 2.2 to clarify our expectations that, in general, BIPRU firms should hold sufficient capital now to meet their overall financial adequacy rule (GENPRU 1.2.26R) in the face of a stress scenario after allowing for realistic management actions.

3.61 As part of their stress and scenario testing, firms should consider the impact of their stress tests on the eligibility of their capital resources. This is because losses can have a potentially significant impact on the eligibility of a firm's capital resources when the capital resources gearing rules are taken into account. We have therefore added some extra Handbook text (GENPRU 1.2.42C G) to clarify that firms should consider this issue as part of their stress and scenario testing.

Q9: Do you have any comments on the proposed changes to the general stress and scenario testing rule and additional guidance for firms?

Q10: Do you have any comments on our requirements that in general firms should hold capital now against the overall financial adequacy rule, including in a stress scenario after allowing for realistic management actions?

## Market risk

3.62 The events of the past year have shown that there can be a high correlation (and contagion) between different positions, risk types and markets. Firms did not reflect these events in their stress testing for market risk and we are seeking to clarify our rules and provide guidance to steer firms in the right direction.

3.63 Stress testing is an important risk-management tool and it is essential that firms perform regular and comprehensive stress testing on their trading book portfolios. Our prudential rules require that all firms with trading books have a documented trading strategy, policies and procedures to monitor their strategy. This will include using stress testing to measure and manage all material sources of market risk.

3.64 Stress testing should be used by senior management to set and monitor policies and limits for the firm, who should then take appropriate action based on the results of the stress tests. Appropriate action could include reassessing whether the firm continues to operate within its risk appetite, changing the firm's strategy and taking mitigating actions.

3.65 These stress testing requirements are not intended to affect a firm's capital requirements directly. However, a firm should consider the results of this stress testing in its Pillar 2 capital assessment.

3.66 Our proposed new requirements in BIPRU 7.1 aim to clarify the nature of the stress testing that firms should undertake for positions that are subject to the standard market risk rules. These requirements clarify the fact that stress testing of the trading book must be comprehensive. We have also highlighted a number of factors that it

might be appropriate for a firm to consider depending on the size and complexity of its trading book. These include:

- The frequency of the stress testing should be determined by the nature of the positions.
- The stresses should include instant shocks as well as longer term periods of stress. Where the stresses take place over an extended period of time firms should consider the hedging strategies that would be used over this period of time, as the cost of dynamically hedging may be significant.
- Stress testing should be conducted both at the trading desk level and on a firm-wide basis. While firms may be able to identify risks at the trading desk level quite well they should also be able to prepare holistic scenarios that consider market risk for the firm.
- Firms should consider how prudent valuation principles (GENPRU 1.3) will be met in a stressed scenario. In particular, stressed conditions may lead to illiquidity of positions, which will require firms to consider valuation adjustments or reserves.

3.67 Firms with CAD 2 model recognition tend to have more complex trading books and their stress testing framework should reflect this. We have updated BIPRU 7.10.72R(2) to include a number of additional factors that those firms should address in their stress testing. This list is not exhaustive and firms should take account of the nature of positions held when defining their stressed scenarios. The additional factors that should be considered are as follows:

- Whether the firm's stress-testing framework is comprehensive and appropriate for the size and complexity of trading book positions held.
- Secondary risk factors.
- Basis risk.
- Systemic as well as localised stresses.
- Full revaluation or a reliable approximation of positions. This is important for firms that have material exposure to non-linear products.
- Instant shocks as well as the effects of longer term periods of stress. Where the stresses take place over an extended period of time firms should consider the hedging strategies they would use over this period, as the cost of dynamically hedging may be significant.
- Calibration changes under stressed conditions.

3.68 These stress tests do not directly impact on the capital requirements of firms with model recognition. However, the results of these stress tests should be considered as part of a firm's Pillar 2 capital assessment.

3.69 A firm that has identified market risk as material should conduct Pillar 2 stress and scenario testing. Pillar 2 stress testing must focus on risks not captured by Pillar 1 or only partially captured due to the nature of the risk.

3.70 Where the output of the stress test shows the crystallisation of substantial risks firms should hold additional capital as well as demonstrate that they have taken mitigating actions to manage the risk.

3.71 Scenarios should consider an appropriate range of stresses that are severe and include extreme and/or large loss events. It is important that firms' stress and scenario testing are forward-looking to capture expected changes in the risk profile of their trading books. This means that firms will not only capture historical events but the effect of future adverse market movements on their trading books. It is important to note that adverse market movements can cause a reduction in the value of positions which will reduce capital resources.

3.72 The stress testing will vary based on the nature and complexity of positions held and in particular should consider the volatility of positions, concentrations and valuation adjustments necessary in periods of stress to sell or hedge out from positions held.

3.73 Additional guidance on market risk stress testing has been provided in BIPRU 7.1 and this will be taken into account under the overall Pillar 2 rule. While the guidance provided is fairly comprehensive it will not be considered sufficient for firms to rely solely on this for stress testing under Pillar 2.

Q11: Do you agree with our proposed clarification of the use of stress testing for market risk purposes?

### Interest rate risk in the non-trading book

3.74 Our experience in discussions with firms, including during our SREP reviews, has led us to conclude that under our 'General Requirement' it would be helpful to signal more clearly those risks that we feel should receive particular attention. So, we have made a suitable change to BIPRU 2.3.9 G (1).

Q12: Do you agree with our proposed amendment to our stress testing guidance for interest rate risk in the banking book?

### Securitisation risk

3.75 Current market conditions have shown that funding from securitisation cannot be relied upon as a matter of course. Firms have experienced several difficulties, including: closure of the securitisation markets; higher funding costs; provision of additional support to structures; the unwinding of securitisations as triggers have been met; and pipeline transactions not being completed. It is evident that many financial institutions did not fully understand the risks associated with their securitisation activities and the potential firm-wide impact in stressed market conditions. Where securitisation is a material source of funding there can be an

impact on credit risk, concentration risk, counterparty risk, market risk, liquidity risk and reputational risk.

3.76 So, when performing stress testing, firms should consider their securitisation activities and other off-balance sheet exposures and the firm-wide impact that they may cause in times of stress. We have therefore added additional guidance at GENPRU 9.1.8AG to reflect this. Stress testing of securitisation should take into account both existing securitisations and pipeline transactions, as there is a risk that these transactions will not be completed in stressed market conditions. We would expect that the risks associated with securitisation will be a part of a regular programme of stress testing undertaken by firms. The results of the stress testing must be communicated to senior management and appropriate action should be taken. This could include mitigation of risks identified, seeking alternate sources of funding or changes in a firm's strategy.

Q13: Do you agree with our proposed amendment to our stress testing guidance for securitisation?

## Pension obligation risk

3.77 It has become apparent from our SREP reviews that there is some confusion about our expectations as regards a firm's assessment of pension obligation risk. Pension obligation risk is the risk that a firm's obligations towards an employee pension scheme may increase because of a deterioration in the scheme position. A firm's obligations may increase due to biometric risks, for example longevity risk. In addition, financial risks, such as interest rate risk, wage inflation and equity price falls may also adversely affect a fund's position and increase funding costs for the sponsoring firm.

3.78 We are therefore proposing additional guidance for both BIPRU firms and insurers in GENPRU (GENPRU 1.2.79G – 1.2.85G) to clarify the fact that, for Pillar 2 purposes, a firm should take account both of the direct impact of adverse scenarios on the firm's own business, but also the knock-on consequences for the firm, if any, of a consequent pension scheme deterioration.

Q14: Is our explanation of how estimates of pension obligation risk are impacted by other stress tests sufficiently clear?

## Stress testing requirements for BIPRU firms whose activities are simple

3.79 We are taking this opportunity to clarify to BIPRU firms whose activities are simple what our requirements are in relation to stress testing (BIPRU 2.2.25G (4)). Some additional text in relation to the definition of firms with simple activities has been provided to explain that such firms should be small and have limited credit exposure. It is also intended to provide guidance about our expectations for appropriate stress testing, based on a proportionate approach, for these firms.

Q15: Do you have any comments on our clarification of the Handbook text for BIPRU firms whose activities are simple?

## Group risk

3.80 Membership of a group can change the nature of the risks to which the firm is exposed. These risks are often referred to as 'group risk', which is the risk that a firm may be adversely affected by an occurrence (financial or non-financial) in another group entity or an occurrence that affects the group as a whole. These risks may occur through reputational contagion, financial contagion, leveraging, double or multiple gearing, concentrations and large exposures (particularly intra-group).

3.81 Under the Pillar 2 framework, a firm that is a member of an insurance group (in respect of which it is required to maintain group capital), a UK consolidation group or a non-EEA sub-group is required to carry out an ICAAP/ICAS on a consolidated basis[34]. A firm must assess the amounts, types and distribution of capital resources under Pillar 2 rules on a consolidated basis and explain how the various risks and the resources required by each member of the group have been aggregated. In essence, a firm should consider how its relationships with other entities may impact on its ability to comply with its regulatory objectives. However, group risk may also arise from members of the group that are outside of the consolidation group for which a consolidated assessment is required. So, irrespective of whether an assessment is being consider on a solo basis or on a group basis risks arising from group members that are outside of a consolidation group must also be taken into account.

3.82 In this context, we note that some firms have included the following 'group risk' elements in their ICAAP/ICAS assessments:

- intra-group exposures (credit or operational exposures through outsourcing or service arrangements, as well as more standard business exposures);
- concentration risks (from credit, market or insurance risks which could put a strain on capital resources across entities simultaneously);
- contagion (reputational damage, operational or financial pressures); and
- complex group structures (with dependencies, complex split of responsibilities and accountabilities).

3.83 Given the importance of group risk to the Pillar 2 assessment, it is appropriate that this should be included explicitly in the list of major risks required to be taken into account for Pillar 2 purposes and the stress testing aspects of risk assessment[35]. This should clarify the position of group risk within risk assessments as well as emphasising its relevance in the context of stress testing in particular.

34 Please note that the scope of a group for Pillar 2 consolidation purposes is the same as that for Pillar 1. All relevant subsidiaries and participations must be included.

35 GENPRU 1.2.30R (2) requires a firm to have in place sound, effective and complete processes, strategies and systems that enable it to identify and manage the major sources of risks including credit, operational, concentration and insurance risk etc.

### *Group risk stress testing and scenario analysis*

3.84 In explaining its risk-management framework, a firm should include a description of the group's:

- broad business strategy;
- view of its principal risks; and
- approach to measuring, managing and controlling the risks – including the role of stress testing, scenario analysis and contingency planning in managing risk at the solo and group level.

3.85 We noted in Chapter 2, that in order to maintain their reputations, many firms took back onto their balance sheets instruments that had previously been transferred to off-balance sheet vehicles and conduits such as SIVs. As such, we expect firms' stress testing to take into account the risk that a group may have to bring off-balance sheet activities back onto its balance sheet as a result of reputational contagion – despite the appearance of legal risk transfer. Firms should also identify and take into account other aspects of their business where reputational affects will outweigh legal considerations and cause them to behave differently in stressed conditions.

3.86 In managing group risks, firms may decide to hold additional capital resources at the solo and/or group levels or put in place other mitigating tools (for example, to counter risks arising from complex group structures). So, firms should include group risks in their stress testing and consider what actions are relevant and appropriate.

### *Group risk systems and controls requirements – Handbook changes proposed in the CP*

3.87 SYSC 12[36] sets out a firm's obligation to have adequate, sound and appropriate risk management processes and internal control mechanisms for the purpose of assessing and managing its own exposure to group risk on solo and group bases.

3.88 In order to clarify the relationship that our current Handbook rules in GENPRU and SYSC have with Pillar 2, particularly stress and scenario testing, and to provide guidance on what we expect in the context of group risk, we propose to:

- Insert 'group risk' in the list of major sources of risks in GENPRU 1.2.30R (2). Group risk in this context may well be considered under other headings such as operational, credit or counterparty risk, so this is mainly for clarification purposes. As with the other ICAAP rules, the 'general stress and scenario testing rule' in GENPRU 1.2.42R will continue to apply on a consolidated basis or on a solo basis as before.
- Provide guidance in GENPRU 1.2.32G on what we mean by 'group risk'.
- Include further guidance on group risk stress testing as new GENPRU 1.2.88 G – GENPRU 1.2.91G to reflect our comments under the sub-heading '*Group risk stress testing and scenario analysis*' above.

36 SYSC 12.1.8R (1) and (2), which corresponds with GENPRU 1.2.49R (1)(b) for Pillar 2 purposes.

- Insert guidance in SYSC 12.1.9G, cross-referencing it to GENPRU 1.2.49R, to clarify that stress tests and scenario analyses of group risk will form part of risk management processes and internal control mechanisms in SYSC 12.1.8R (1) and (2). Note that there is no change to the existing requirement as it is only a cross-reference.

Q16: Do you have any comments on the proposed amendments to our group risk Handbook text?

**Annex 1**

# Summary list of questions

## Chapter 2 – Market failure analysis, summary CBA and context for proposed changes

Q1: What is your view of our analysis of the market failures?

Q2: What is your view of our cost-benefit analysis?

## Chapter 3 – Proposed changes to Handbook rules and guidance for stress and scenario testing

Q3: Do you consider our reverse-stress testing proposal reasonable?

Q4: To what extent are firms already undertaking reverse-stress tests? What is the involvement of senior management in the design and review of these tests? What further steps would firms need to undertake to carry out a reverse-stress test as outlined in these proposals?

Q5: Is it appropriate to exclude BIPRU 50K investment firms from the reverse-stress testing requirements if wind-down scenarios are an important part of their risk analysis? Given that our expectations would be based on a proportionate approach by smaller firms, would reverse-stress testing be resource intensive for BIPRU 50K investment firms?

Q6: Do you agree with our proposed clarification of the use of stress testing in IRB quantification?

Q7: Do you agree with our proposed clarification of the use of stress testing for credit risk mitigation purposes?

Q8: Do you agree with our perception of the role of stress testing in operational risk and our proposal not to prescribe any additional stress testing requirements specifically for operational risk?

Q9: Do you have any comments on the proposed changes to the general stress and scenario testing rule and additional guidance for firms?

Q10: Do you have any comments on our requirements that in general firms should hold capital now against the overall financial adequacy rule, including in a stress scenario after allowing for realistic management actions?

Q11: Do you agree with our proposed clarification of the use of stress testing for market risk purposes?

Q12: Do you agree with our proposed amendment to our stress testing guidance for interest rate risk in the banking book?

Q13: Do you agree with our proposed amendment to our stress testing guidance for securitisation?

Q14: Is our explanation of how estimates of pension obligation risk are impacted by other stress tests sufficiently clear?

Q15: Do you have any comments on our clarification of the Handbook text for BIPRU firms whose activities are simple?

Q16: Do you have any comments on the proposed amendments to our Group risk Handbook text?

Annex 2

# Application of the Reverse-Stress Test to smaller Investment Firms

## Background

1. Smaller BIPRU investment firms (excluding BIPRU 50K investment firms with funds under management of £1bn) will be required to undertake a 'reverse-stress test' under the proposals in this CP. The purpose of this test, as explained in Chapter 3, is for a firm to understand its vulnerabilities and to identify scenarios in which its business model would fail. For these purposes, 'failure' should be considered to be a scenario where significant financial losses impacting the firm's capital, lack of liquidity or reputational damage to the firm mean that its existing business model is no longer viable. In particular, a firm's business model may become unviable at a point before it breaches its regulatory capital and liquidity requirements – as recent events have shown. We set out below some of the benefits to smaller investment firms of undertaking a reverse-stress test and the use that the FSA will make of the results.

2. We have not included smaller BIPRU 50K investment firms (i.e. those with funds under management of less than £1 billion) within the scope of this requirement. This is because, whilst we are mindful that while implementation of the reverse-stress test requirement should be proportionate to the scale and complexity of a firm's business, compliance costs are often not fully scalable for smaller firms. BIPRU 50K investment firms do not deal as principal, nor hold client money, though some may have substantial funds under management. So, we consider it appropriate to explicitly require larger BIPRU 50K firms to undertake a reverse-stress test.

## Reverse-stress test – benefits for firms

3. Our experience of market conditions in the past few months has shown us that (limited licence) investment firms' capital surpluses can disappear quickly under stress conditions. So, a reverse-stress test is likely to benefit firms if they put in place adequate contingency plans to deal with the types of stresses that would cause their business model to fail. (For example, if there was a sudden and sustained fall in income accompanied by reduced consumer confidence, which may subsequently result in lower business volumes.)

4. As a result of considering such scenarios, firms may either do nothing or amend their business model or put in place contingency plan triggers to deal with such

events. In practice, we would expect a firm to at least consider putting in place some contingency plan triggers. This would ensure that their business was prepared to respond flexibly to a scenario that threatened its continued existence.

5. The information required for a reverse-stress test is also, most likely, already generated by firms. Our current rules require limited licence[37] investment firms to produce three to five year business plans. And considering potential business model failure (e.g. a problem with the relationship with one or more large clients) may be part of the analysis that firms consider as part of that annual corporate planning cycle, such as SWOT[38] analysis. So, it is likely that many firms are already undertaking a reverse-stress test of their business as an integral part of the process. This requirement will increase the focus on this aspect of firms business planning, which may make this information more user-friendly.

6. The reverse-stress test is also likely to increase senior management engagement in considering the firms key risks. One key point about the ICAAP for small firms is that new Directors, in particular, find it an invaluable source of information about the firm's financial profile and risks. Material on a firm's reverse-stress test would be a helpful supplement to this information for all of a firm's Directors and senior management.

7. We would also expect there to be active senior-management discussion of both the design and results of such a reverse-stress test, and evidence that it had informed senior management decision-making – be that a decision either to accept the risk (e.g. because the scenario is sufficiently unlikely) or to amend the current business model, or otherwise to mitigate the risk. This information should also be used by senior management in considering the firm's overall risk appetite and the underlying aggregate risk tolerances and triggers across business lines, and contingency planning to reduce the impact of adverse scenarios crystallising.

## Regulatory use of reverse-stress test

8. We will review the reverse-stress test alongside a firm's ICAAP for those firms that have an FSA relationship manager. This does not mean that the reverse-stress test will necessarily be a part of our consideration in terms of individual capital guidance (ICG). However, the SREP may be an appropriate time to open up dialogue and discuss the outcomes of the reverse-stress test. Those firms without a relationship manager will be expected to provide a copy of their reverse-stress test when we request their ICAAP.

37 BIPRU 125K and BIPRU 50K firms

38 Strengths, weaknesses, opportunities and threats

**Annex 3**

# Key messages for insurers

1. Our recent Insurance Sector Briefing[39] (the briefing) updated insurers' senior management and their advisers on important aspects of their risk and capital management in current market conditions. In particular, it highlighted the need for insurers to continue actively to embed change 'including continuing to make advances in the integration of risk and capital management'. One key aspect of these advances was the need for insurers to be 're-thinking and updating stress and scenario practices'. The briefing also provided some feedback for insurers on how – within the existing rules and guidance – we expected them to develop their approach to stress and scenario testing in light of recent market events.

2. Our stress and scenario testing CP was trailed in the briefing and proposes some changes to our Handbook rules and guidance across the insurance, banking, building society and investment firm sectors.

3. In addition, our CP offers further industry feedback on stress and scenario testing. Some of this is specific to BIPRU firms and complements the recent feedback to insurers. But there are common high-level themes, consistent with our recent briefing for insurers, namely that firms in all sectors need to be more thoughtful in their stress testing and scenario analysis and that these activities should be better embedded into senior management decision-making processes.

## Aspects of this CP of particular interest to insurers

4. While insurers will find other aspects of interest, we suggest below areas that they should particularly focus on:

5. ***Chapter 2 – Context for our proposed changes:*** recent market events and feedback on stress testing (paragraph 2.16); and lessons learned (paragraphs 2.28 onwards).

6. ***Chapter 3 – Proposed changes to Handbook rules and guidance:*** While some of our proposed Handbook changes affect BIPRU and are therefore relevant only to banks and other firms subject to the CRD, a number of our proposals are relevant to insurers. In particular, insurers should consider the following:

39 *Insurance Sector Briefing: Risk and capital management update*, FSA, September 2008 (www.fsa.gov.uk/pubs/other/isb_risk_update.pdf)

- ***Reverse-stress test:*** we propose to introduce a 'reverse-stress test' requirement, whereby an insurer must identify and assess the scenarios most likely to cause its current business plan to become unviable. This proposal is discussed in paragraphs 3.12 to 3.30. A new SYSC chapter is proposed to set out this requirement (SYSC 19);

- ***Capital Planning:*** the clarification of our GENPRU rules and guidance on stress and scenario testing in the context of capital planning[40], typically, over a 3 to 5 year time horizon. These set out the requirement for an insurer to project the capital necessary to cover all its material risk exposures and to support any new business plans taking account of the effects of potential adverse economic and business cycles. These clarifications are discussed in paragraphs 3.42 to 3.61 and primarily affect GENPRU 1.2.42R, GENPRU 1.2.73G, GENPRU 1.2.75G and INSPRU 7.1; and

- further guidance on pension obligation risk (paragraphs 3.77 to 3.78, GENPRU 1.2.79G to GENPRU 1.2.85G) and group risk (paragraphs 3.80 to 3.88, GENPRU 1.2.30R(2)(l) and GENPRU 1.2.87G to GENPRU 1.2.91G).

- The draft instrument for Handbook text is appended to this CP.

7. Insurers should also consider the cost-benefit analysis of our proposals in Annex 4 of this paper.

40 Insurers should particularly consider GENPRU 1.2.42 R, GENPRU 1.2.73 G and GENPRU 1.2.75 G

Annex 4

# Cost-benefit analysis

## Introduction

1. This annex contains our cost benefit analysis for the measures set out in Chapter 3. We are required to provide an estimate of the costs and an analysis of the benefits under the Financial Services and Markets Act 2000.

2. There are two issues addressed in this cost-benefit analysis: reverse-stress testing; and amendments to Pillar 1 and Pillar 2 stress-testing policy.

3. For this analysis, we undertook a survey of firms to obtain an estimate of the expected costs of the reverse-stress test. In considering the likely benefits of the amendments to Pillar 1 and Pillar 2 stress testing policy, we have used estimates from the Real Assurance studies undertaken in 2006[41], adjusted for changes to prices. The CBA is set out as follows:

   a) a brief description of the firms that will be affected by the proposed measures;

   b) the market failures addressed by the proposed measures;

   c) estimates of the costs and consideration of the benefits of reverse-stress testing; and

   d) estimates of the costs and benefits of the amendments to Pillar 1 and Pillar 2 stress testing policy.

## Firms affected by policy measures

4. The two policy measures considered in this consultation apply to two broad groups of firms:

   a) BIPRU firms, namely banks, building societies and CRD investment firms, all of whom are subject to the CRD; and

   b) Insurers.

41 *Estimation of FSA Third Party Administrative Burdens*, Report for the FSA by Real Assurance Risk Management, December 2006 (www.fsa.gov.uk/pubs/other/admin_burdens.pdf)

5. In total, we estimate that around 4,000 firms will be affected by the policy measures, all of whom are subject to prudential capital requirements under either the CRD or our prudential requirements for insurers regimes (see Table 1).

6. By far the largest sub-set of BIPRU firms is CRD investment firms which may be further sub-divided into different categories, according to the provisions of BIPRU 1.1.18R. Nearly three-quarters of CRD investment are classified as BIPRU 50K firms which do not take positions, deal as principal, nor hold client money. Given the limited scope of the activities undertaken by these firms, we expect that the costs and benefits of the measures imposed should be smaller than for other groups of firms.

Table 1: The population of firms affected by policy measures

| | Small | Medium | Large | All Firms |
|---|---|---|---|---|
| **CRD Firms** | | | | |
| Banks | 128 | 12 | 10 | 150 |
| Building Societies | 53 | 5 | 1 | 59 |
| Investment Firms[42] | 3008 | 234 | 148 | 3390 |
| **Insurance Firms** | 214 | 121 | 63 | 398 |

Source: FSA regulatory returns

7. Large banks, building societies and insurers, while smaller in number, are in general more complicated than investment firms, a factor that is reflected in the cost estimates from the survey. We also note that, while the reverse-stress test policy will apply to both CRD[42] firms and insurers, many of the amendments to Pillar 1 and Pillar 2 stress testing will only affect firms subject to the CRD.

## Market failures

8. As noted in Chapter 2, we have undertaken to adopt new policy where there is an identifiable market failure and where policy intervention provides net benefits. To place the CBA in context, these market failures are set out below.

9. We undertake prudential regulation to overcome a number of market failures that result in firms holding insufficient capital for the risks that they face in relation to an efficient market outcome. The market failures stem from:

   a) insufficient competitive pressure from shareholders and other stakeholders (consumers and counterparties). Complicated products and firm business structures make it difficult for shareholders and stakeholders to assess a firm's overall level of risk. Consequently, shareholders/stakeholders cannot identify those firms that match their own risk appetites, so there is insufficient competitive pressure on firms to choose an appropriate capital level.

   b) firms that may consider themselves to be 'too big to fail'. These firms may have an incentive to raise their returns by increasing risk, as there is an expectation

42 BIPRU 50K investment firms with less than £1 billion in funds under management are excluded.

that they will be bailed out (and the additional risk absorbed) by the public sector in the event that they become insolvent.

c) The potential social cost of a firm's failure. A firm may hold sufficient financial resources to reduce its risk of failure, but may not consider the costs that would be incurred if its failure were to either precipitate or exacerbate a systemic failure. A firm's customers may suffer losses as a result of the firm failing if compensation schemes do not offer a 100% guarantee. Additionally, if a firm's failure causes wider systemic disruption, other market participants may suffer losses that would impact their investors, or that may be passed on to consumers in the form of higher prices.

10. Recent events evidence some of these market failures and suggest that, in practice, firms' implementation to date of our current prudential policy does not address them sufficiently. We consider that they demonstrate the need to strengthen our current policy to help ensure that firms more fully explore 'tail risks' and low probability, high impact events. We are proposing to introduce new requirements to help ensure that firms are aware earlier when developing events pose a significant threat to their business model, so that they may adjust their strategy to prepare for a more orderly wind-down, transfer, or re-structuring of their business.

11. In addition, our experience to date of ICAAP submissions from firms subject to the CRD is that one of the reasons that firms have not yet fully implemented our current stress and scenario testing requirements is that some are confused about our expectations. In addition, there is also been some confusion about how our GENPRU rules on stress and scenario testing apply to insurers. So, the revision to guidance on Pillar 1 and 2 requirements is intended to ensure that existing policy is fully understood and complied with by firms, thereby ensuring that the market failure is addressed.

12. Recent market events have given rise to widespread concerns that remuneration schemes at some firms may have exacerbated the more general market failures noted above as the remuneration incentives offered to business executives were not sufficiently aligned with the interests of firms' wider stakeholders. On 13 October 2008 we published a 'Dear CEO' letter on remuneration policies which set out good and bad criteria. Amongst other matters, this suggested that bonus calculations should take risk and capital costs into account and that there should be Board level oversight of remuneration policies. Our strengthened and clarified stress and scenario testing requirements should help ensure that firms' Boards have access to fuller and more robust risk information.

## Reverse-stress testing

### Costs

13. We estimate that the total cost to firms of the reverse-stress testing requirement is approximately £65 million (see Table 2). Overall, investment firms are estimated to face the highest overall costs although this reflects more the larger number of firms, rather than a much higher cost per firm.

Table 2: Total costs of reverse-stress tests

| | £000s |
|---|---|
| Banks | 6,520 |
| Building Societies | 4,775 |
| Investment Firms | 36,900 |
| Insurance Firms | 14,400 |
| **Total** | **62,595** |

14. Detail of the cost estimates from the survey by firm size and type are shown in Table 3. Some gaps in the survey responses mean that we did not have estimates for all sizes and types of firms. We have therefore assumed that costs for some sizes and types of firms are the same as those estimated for similar firms for which we have data. The accuracy of our estimates will therefore depend, to some extent, on whether costs are very different for the firms for which we received no responses to the survey.

Table 3: Reverse-stress test costs by size and type of firm

| | £000s | | |
|---|---|---|---|
| | **Small** | **Medium** | **Large** |
| ***Banks*** | | | |
| Staff training and recruitment | 300 | 500 | 100 |
| Development of models | 2900 | 500 | 600 |
| IT systems and interface | 0 | 200 | 0 |
| Senior management review time | 800 | 100 | 400 |
| Board review time | 0 | 20 | 100 |
| **Total** | **3900** | **1320** | **1300** |

| | **Small** | **Medium/Large** |
|---|---|---|
| ***Building Societies*** | | |
| Staff training and recruitment | 200 | 10 |
| Development of models | 3300 | 10 |
| IT systems and interface | 300 | 10 |
| Senior management review time | 300 | 40 |
| Board review time | 700 | 5 |
| **Total** | **4700** | **75** |

| | Small | Medium | Large |
|---|---|---|---|
| ***Investment Firms*** | | | |
| Staff training and recruitment | 2200 | 500 | 400 |
| Development of models | 5600 | 1300 | 1900 |
| IT systems and interface | 6400 | 2500 | 1500 |
| Senior management review time | 4800 | 1400 | 700 |
| Board review time | 5300 | 1600 | 700 |
| **Total** | **24400** | **7300** | **5200** |

| | Small | Medium | Large |
|---|---|---|---|
| ***Insurance Firms*** | | | |
| Staff training and recruitment | 300 | 200 | 100 |
| Development of models | 2100 | 1200 | 300 |
| IT systems and interface | 200 | 100 | 100 |
| Senior management review time | 2700 | 1500 | 1500 |
| Board review time | 1500 | 900 | 1700 |
| **Total** | **6800** | **3900** | **3700** |

Source: FSA regulatory returns, FSA survey of firms

15. On average, firms reported that developing models and senior management review time would cause the highest costs as a result of the reverse-stress testing requirement. Some large firms in particular reported that, if the reverse-stress test is to be properly considered at board level and have sufficient traction in the firm's business decision making, several iterations would be necessary for senior management to be confident in the result.

16. Some medium-sized firms noted that they may face additional costs if they require either external consultancy services to develop or audit the reverse-stress test, or if they need to purchase additional software to properly undertake the reverse-stress test. However, it was not possible to calculate estimates of these additional costs as they would only become apparent once the reverse-stress tests are implemented.

17. Initially, we did not anticipate that firms would face additional ongoing compliance costs of undertaking the reverse-stress test as replication of the test was expected to be relatively straightforward. However, the survey results suggest that firms may face ongoing compliance costs that could be as large as the one-off cost estimate. Indeed, if just the senior management and board review costs were incurred each time regulatory submissions were made, the total ongoing cost would be around £27 million per annum.

18. We do not, in general, expect the reverse-stress test to lead to additional capital costs for firms. The reverse-stress test, by definition, will provide information on the conditions under which the firm will fail. The current prudential requirements are calibrated to reduce risk to an appropriate level, but not eliminate risk altogether. If a reverse-stress test reveals that the firm does not hold appropriate levels of capital, it is most likely that the firm will also be in breach of other prudential capital requirements.

19. However, the reverse-stress test may lead to additional costs to a firm if the outcome reveals an unacceptable risk to our statutory objectives. These costs could arise, for example, from any remedial changes to business models that need to be made, and would be in addition to those costs estimated in Table 2.

20. In addition to the direct costs to firms, there are potential impacts for other market participants, particularly consumers. The costs of conducting these tests are likely, at least in part, to be passed through to consumers in the form of higher prices. The extent of the pass through will be different for different sectors. Large firms may be better able to absorb the cost and may have a larger range of products over which any cost increase could be applied, which would lower the price impact on any particular product. However, smaller firms operating in competitive markets may have less scope to absorb costs and may see a greater pass through to consumer prices.

### Benefits

21. The reverse-stress test is a tool intended to enhance risk management within a firm. The benefits are expected to arise from a more informed view of a firm's risks, to both the firm and the FSA, and the management consideration of any action to mitigate those risks. This additional information on risk is intended to help overcome the potential mismatch between the risk appetite of the firm's management and that of shareholders and stakeholders.

22. However, the realisation of these benefits will depend on whether the test provides useful additional information for firms' risk management, and how effectively any additional information is used by both the firm and supervisors. Firms will need to incorporate any new information into their business models and management considerations to ensure that they gain the full benefits of the test. Upon implementation, we will need to consider the reverse-stress test alongside the ICAAP and ARROW frameworks to ensure that firms' senior managers are fully engaged with the process so that this benefit is realised.

23. There are also other risks to realising the benefits. A key risk is that the scenarios developed by firms for the reverse-stress test are not of sufficiently high quality (e.g. are not articulated clearly or do not consider all scenarios that might cause the firm's business model to fail). The utility of the reverse-stress test will be dependent upon the quality of the scenarios considered. This risk should, however, be mitigated by the supervisory process.

## Amendments to Pillar 1 and Pillar 2 stress-testing policy

24. There are several proposed amendments to both Pillar 1 and Pillar 2 stress testing policy which will be reflected in our Handbook rules in GENPRU[43], BIPRU[44] and INSPRU[45]. However, these changes represent a clarification of existing policy requirements and are not intended to represent additional requirements on the part of BIPRU firms and insurers.

43 General Prudential sourcebook (applicable to Banks, Building Societies, CRD Investment Firms and Insurers)

44 Prudential sourcebook for Banks, Building Societies and Investment Firms

45 Prudential sourcebook for Insurers

25. Since the CRD was implemented in January 2007, a number of firms' ICAAP submissions[46] have illustrated that there is some confusion over the current guidance on stress and scenario testing. Consequently, firms are incurring costs that are in addition to the anticipated costs of CRD implementation, as submissions have to be altered or updated. As noted above, there also appears to be some confusion about how our GENPRU rules apply to insurers.

26. Where a firm is required to alter or update its ICAAP submission, there is some possibility that this firm is non-compliant with FSA regulation until the submission is reworked and appropriate remedial action taken. In this scenario, regulation is not effectively correcting the market failures that it seeks to address.

27. So, firms will benefit from a reduction in unanticipated costs through the clarification of our rules and guidance in GENPRU, BIPRU and INSPRU. Removing this uncertainty will also benefit consumers and other stakeholders by potentially minimising the period over which a firm may be non-compliant with our requirements.

28. We do not anticipate any other incremental costs to firms, the FSA, consumers or other market participants from these amendments to Pillar 1 and Pillar 2 stress testing policies. It should also be noted that any change to capital, or other cost, considerations that may arise from repetition of firms' ICAAP submissions are not incremental to this policy measure. Rather, these other costs remain unchanged from our initial estimation of the costs of the CRD[47].

29. We estimate that the maximum benefit that may arise from amending our Pillar 1 and Pillar 2 stress testing policy could be as high as £3½-4 million. This estimate is derived by considering the likelihood that a firm will need to alter or update their ICAAP submissions based on the current experience, and the estimated cost of making a submission.

30. The estimated cost of making an ICAAP submission is based on the *ongoing* cost to CRD firms[48] of the Pillar 2 requirement. We felt this was the most appropriate cost for this purpose, although it is likely to overstate the cost of ICAAP submissions. To estimate the likelihood that a firm will need to alter or update their ICAAP submission – which would cause firms to incur at least part of the submission cost again – we considered the proportion of firms that have already undertaken some revision to their submissions. Again, we are aware that this may be an overestimate, as communication efforts by trade bodies and by us would most likely reduce the number of errors.

46 The changes that we are proposing to make to INSPRU are a result of our proposed amendments to the capital planning rules in GENPRU. So, insurers' ICA (Individual Capital Adequacy) submissions should be unaffected.

47 See CP06/3, Strengthening Capital Standards 2, February 2006, www.fsa.gov.uk/pages/Library/Policy/CP/2006/06_03.shtml

48 The CRD estimates have been adjusted by the growth in private sector average earnings, excluding bonuses to allow for increases in costs.

Annex 5

# Compatibility with our objectives and the principles of good regulation

## Introduction

1. This Annex sets out our view on how our plan to introduce a reverse-stress test requirement and our proposed drafting clarifications to our Handbook rules and guidance on stress and scenario testing are compatible with our statutory objectives and the principles of good regulation.

## Compatibility with our statutory objectives

2. The proposals set out in this Consultation Paper (CP) and the draft Handbook rules and guidance that accompany it, aim to meet our statutory objectives of market confidence and consumer protection.

## Market confidence

3. This statutory objective requires us to maintain confidence in the UK financial system. Our draft Handbook rules and guidance seek to reduce the risk of market disruption arising from financial failure of an authorised firm or group of firms. We propose to do this by:

    - Introducing a reverse-stress test requirement: this would require a firm to identify the adverse scenarios most likely to cause its current business plan to become unviable and to consider how its stress testing results should inform integrated senior-management decision-making on the firm's business strategy, risk-management and capital planning. We consider that reverse-stress testing should help ensure: better informed senior-management decision-making taking more account of low probability, high impact events; and a more orderly wind-down or transfer of a firm's business in the event of any failure.

    - Clarifying our existing policy on stress and scenario testing in a Pillar 2 capital context. This should help ensure that firms improve their stress and scenario testing and assess their required capital taking into account all the material risks to which they are exposed. In particular, these changes are intended to improve firms' capital planning and their assessment of the impact on their capital position of adverse market events and economic downturns.

## Consumer protection

4. Consumers may suffer detriment from the financial failure of a firm if: they suffer direct losses that are not fully guaranteed by the Financial Services Compensation Scheme; or if there is a consequent wider systemic failure resulting in costs arising from public sector remedial interventions or adverse wider economic impacts. Requirements that improve the standard of regulated firms' risk management and capital planning through the use of stress and scenario testing, thereby reducing the risk to consumers from financial failure of a firm, should hence contribute to consumer protection.

## Compatibility with the need to have regard to the principles of good regulation

5. Section 2(3) of the Financial Services and Markets Act 2000 (FSMA) requires that, in carrying out our general functions, we should have regard to the principles of good regulation. The most relevant principles in this context are set out below.

### Need to use our resources in the most efficient and economic way

6. Our clarifications of our stress and scenario testing Handbook policy should ensure that firms submit improved ICAAP/ICAS submissions. This will lead to a reduction in the resources used by us in undertaking SREP reviews.

### The responsibilities of those who manage the affairs of authorised persons

7. Stress and scenario testing is critical to senior managers making well-informed decisions about business strategy, risk management and capital planning. The proposals outlined in this CP are aimed at improving that decision-making through improvements to a firm's stress and scenario testing programmes.

8. The proposals in the CP are also principles-based. This recognises the fact that a firm's senior management are the responsible for securing improvements in decision-making. So, we expect them to achieve any necessary improvements through active engagement in the design and implementation of their firm's stress and scenario testing arrangements.

### The restrictions we impose on the industry must be proportionate to the benefits that are expected to result from those restrictions

9. We have undertaken cost-benefit analysis, including a survey of firms to assist us in understanding the impact of the reverse-stress test, to help inform this consultation. The results of this are set out in Chapter 2 and in Annex 4.

10. We have not estimated the costs of the clarifications to our rules and guidance regarding Pillar 1 and Pillar 2 stress testing. This is because these changes are a clarification of existing policy and are not intended to represent additional requirements for BIPRU firms and insurers. We have, however, estimated the benefits of these clarifications. These benefits arise from the costs saved by firms in not having to alter or update their ICAAP submissions.

### The desirability of facilitating innovation in connection with regulated activities

11. The proposed reverse-stress test and clarified Handbook rules and guidance are designed to enhance a firm's risk management. (And they should not be interpreted as indicating that we are now pursuing a 'zero-failure' policy.) Indeed, this focus on stress and scenario testing should facilitate risk management innovation.

### The international character of financial services and markets and the desirability of maintaining the competitive position of UK regulated firms

12. Internationally, firms and supervisors have been considering improvements to stress and scenario testing practices. We consider that UK regulated firms should share the benefits of this work on enhanced risk management practice. So, the proposals in this CP have been drawn up in the context of these international developments, in particular the work of the Senior Supervisors Group and the Basel Committee's Risk Management and Modelling Sub-Group.

### The desirability of facilitating competition between those who are subject to any form of regulation by FSA

13. The overall effect of our proposals should be to improve senior management decision-making through enhanced risk management. This should, in turn, lead to more effective competition.

### Acting in a way which we consider most appropriate for the purpose of meeting our statutory objectives

14. Our view is that stress and scenario testing is an important tool for firms' prudential risk management. However, our experience has been that for many firms stress and scenario testing is not as robust or embedded in senior management decision-making as we would like.

15. So, we consider it desirable to require a firm to ensure that it explores more fully its 'tail' risks which, if they were to crystallise, would cause its business model to fail. We have also proposed some clarifications of our existing Handbook rules and guidance. Our aim in both cases is to enhance a firm's risk management through improved senior management decision-making.

**Appendix 1**

# Draft Handbook text

**PRUDENTIAL REQUIREMENTS (STRESS TESTING) INSTRUMENT 2009**

**Powers exercised**

A. The Financial Services Authority makes this instrument in the exercise of:

(1) the following powers and related provisions in the Financial Services and Markets Act 2000 ("the Act"):

(a) section 138 (General rule-making power);
(b) section 150(2) (Actions for damages);
(c) section 156 (General supplementary powers); and
(d) section 157(1) (Guidance); and

(2) the other powers and related provisions listed in Schedule 4 (Powers exercised) to the General Provisions of the Handbook.

B. The rule-making powers referred to above are specified for the purpose of section 153(2) (Rule-making instruments) of the Act.

**Commencement**

C. This instrument comes into force on [ ].

**Amendments to the Handbook**

D. The modules of the FSA's Handbook of rules and guidance listed in column (1) below are amended in accordance with the Annexes to this instrument listed in column (2).

| (1) | (2) |
|---|---|
| Glossary of definitions | Annex A |
| Senior Management Arrangements, Systems and Controls (SYSC) | Annex B |
| General Prudential sourcebook (GENPRU) | Annex C |
| Prudential sourcebook for Banks, Building Societies and Investment Firms (BIPRU) | Annex D |
| Prudential sourcebook for Insurers (INSPRU) | Annex E |

**Citation**

E. This instrument may be cited as the Prudential Requirements (Stress Testing) Instrument 2009.

By order of the Board

[Date]

## Annex A

## Amendments to the Glossary of definitions

In this Annex, underlining indicates new text.

*group* …

(3) (for the purposes of *SYSC* 12 (Group risk systems and controls requirement), *SYSC* 19 (Reverse stress testing) and *GENPRU* 1.2 (Adequacy of financial resources) and in relation to a *person* "A")) A and any *person*:

(a) who falls into (1);

(b) who is a member of the same *financial conglomerate* as A;

(c) who has a *consolidation Article 12(1) relationship* with A;

(d) who has a *consolidation Article 12(1) relationship* with any *person* in (3)(a);

(e) who is a *subsidiary undertaking* of a person in (3)(c) or (3)(d); or

(f) whose omission from an assessment of the risks to A of A's connection to any *person* coming within (3)(a)-(3)(e) or an assessment of the financial resources available to such *persons* would be misleading.

…

## Annex B

## Amendments to Senior Management Arrangements, Systems and Controls (SYSC)

In this Annex, underlining indicates new text, unless otherwise stated.

7.1.4B G For a *common platform firm* included within the scope of *SYSC* 19.1.1R, the strategies, policies and procedures for identifying, taking up, managing, monitoring and mitigating the risks to which the *firm* is or might be exposed include conducting reverse stress testing in accordance with *SYSC* 19. A *common platform firm* which falls outside the scope of *SYSC* 19.1.1R should consider conducting reverse stress tests on its business plan as well. This would further *senior personnel's* understanding of the *firm's* business plan's vulnerabilities and would help them design measures to prevent or mitigate the risk of business failure.

…

12.1.9 G For the purposes of *SYSC* 12.1.8R, the question of whether the risk management processes and internal control mechanisms are adequate, sound and appropriate should be judged in the light of the nature, scale and complexity of the *group's* business. Risk management processes must include the stress testing and scenario analysis required by *GENPRU* 1.2.42R and *GENPRU* 1.2.49R(1)(b).

…

After *SYSC* 18, insert the following new chapter. The text is all new and is not underlined.

### 19 Reverse stress testing

Application and purpose

19.1.1 R (1) *SYSC* 19 applies to:

(a) a *BIPRU firm*, unless it is an excluded *BIPRU 50K firm*; and

(b) an *insurer* unless it is:

(i) a *non-directive friendly society*; or

(ii) a *Swiss general insurer*; or

(iii) an *EEA-deposit insurer*; or

(iv) an *incoming EEA firm*; or

(v) an *incoming Treaty firm*.

(2) In (1)(a), a *BIPRU 50K firm* is an excluded *BIPRU 50K firm* unless, if it manages individual portfolios of investments in *financial instruments*, it has funds under management of £1 billion or more (or the equivalent amount in foreign currency).

19.1.2 G This section amplifies *Principle* 2, under which a *firm* must conduct its business with due skill, care and diligence, and *Principle* 3, under which a *firm* must take reasonable care to organise and control its affairs responsibly and effectively, with adequate risk management systems.

19.1.3 G This section contains *rules* on reverse stress testing, which require a *firm* to identify and assess the events and circumstances that would cause its business plan to fail. This section also requires the *firm's* senior management or *governing body* to review and approve the results of the reverse stress testing exercise. This should help the *firm's* senior management identify its business plan vulnerabilities and design a strategy to prevent or mitigate the risk of business failure.

19.1.4 G The reverse stress testing requirements are an integral component of a *firm's* business planning and risk management under *SYSC*. For *BIPRU firms* as referred to in *SYSC* 19.1.1R(1)(a), this section amplifies *SYSC* 7.1.1G to *SYSC* 7.1.8G on risk control. For *insurers* as referred to in *SYSC* 19.1.1R(1)(b), this section amplifies *SYSC* 14.1.17G to *SYSC* 14.1.25G on business planning and risk management.

Reverse stress testing requirements

19.1.5 R As part of its business planning and risk management obligations under *SYSC*, a *firm* must reverse stress test its business plan, that is, it must carry out stress tests and scenario analyses that test its business plan to failure. To that end, the *firm* must:

(1) identify a range of adverse circumstances which would cause its business plan to become unviable and assess the likelihood that such events could crystallise; and

(2) where those tests reveal a risk of business failure inconsistent with the *firm's* risk appetite or tolerance, adopt effective arrangements, processes, systems or other measures to prevent or mitigate that risk.

19.1.6 G In carrying out the stress tests and scenario analyses required by *SYSC* 19.1.5R, a *firm* should at least take into account each of the sources of risk identified in accordance with *GENPRU* 1.2.30R(2). Where a *firm* is a member of a *group*, it should conduct the reverse stress test on a solo basis as well as on a *group* basis.

19.1.7 R The design and results of a *firm's* reverse stress tests must be documented and reviewed and approved at least annually by the *firm's* senior management or *governing body*. A *firm* must update its reverse stress test more frequently if it is appropriate to do so in the light of substantial changes in the market or in macroeconomic conditions.

19.1.8 G (1) Business plan failure in the context of reverse stress testing should be understood as the point at which the market loses confidence in a *firm* and this results in the *firm* no longer being able to carry out its business activities. Examples of this would be the point at which all or a substantial portion of the *firm's* counterparties are unwilling to continue transacting with it or seek to terminate their contracts, or the point at which the *firm's* existing shareholders are unwilling to provide new capital. Such a point may be reached well before the *firm's* financial resources are completely exhausted.

(2) The *FSA* may request a *firm* to quantify the impact on financial resources that, in the *firm's* view, would place it in a situation of business failure as described in (1).

19.1.9 G Reverse stress testing should be aligned with the *firm's* risk appetite or tolerance in relation to its business plan, as well as with the nature, size and complexity of its business. Where reverse stress testing reveals that a *firm's* risk of business failure exceeds its risk appetite, the *firm* should devise realistic measures to prevent or mitigate the risk of business failure, taking into account the time that the *firm* would have to react to these events and implement those measures. As part of these measures, a *firm* should consider if changes to its business plan are appropriate. These measures, including any changes to the *firm's* business plan, should be documented as part of the "results" referred to in *SYSC* 19.1.7R.

19.1.10 G In carrying out its reverse stress testing, a *firm* should consider the impact on its business of a failure of one or more of its major counterparties as well as the impact of a significant market disruption arising from the failure of a major market participant.

19.1.11 G (1) The *FSA* may request a *firm* to submit the design and results of its reverse stress tests and any subsequent updates together with the *firm's ICAAP*, in the case of a *BIPRU firm*, or with its *ICA*, in the case of an *insurer*.

(2) In the light of the results of a *firm's* reverse stress tests, the *FSA* may require the *firm* to implement specific measures to prevent or mitigate the risk of business failure where that risk is not sufficiently mitigated by the measures adopted by the *firm* in accordance with *SYSC* 19.1.5R, and the *firm's* potential failure poses an unacceptable risk to the *FSA's* statutory objectives.

## Annex C

## Amendments to the General Prudential sourcebook (GENPRU)

In this Annex, underlining indicates new text and striking through indicates deleted text.

1.2.27 G The liabilities referred to in the *overall financial adequacy rule* include a *firm's* contingent and prospective liabilities. It excludes liabilities that might arise from transactions that a *firm* has not entered into and which it could avoid, for example, by ~~ceasing to trade~~ taking realistic management actions such as ceasing to transact new business after a suitable period of time has elapsed. It includes liabilities or costs that arise as a consequence of strategies other than continuing as a going concern. It also includes claims that could be made against a *firm*, which ought to be paid in accordance with fair treatment of *customers*, even if such claims could not be legally enforced.

…

Systems, strategies, processes and reviews

1.2.30 R A *firm* must have in place sound, effective and complete processes, strategies and systems:

…

(2) that enable it to identify and manage the major sources of risks referred to in (1), including the major sources of risk in each of the following categories where they are relevant to the *firm* given the nature and scale of its business:

…

(j) interest rate risk (including in the case of a *BIPRU firm*, interest rate risk in the *non-trading book*); ~~and~~

(k) pension obligation risk; and

(l) group risk.

…

1.2.32 G (1) This paragraph gives *guidance* on some of the terms used in the *overall Pillar 2 rule*.

…

(6) In a broad sense, group risk is the risk that a *firm* may be adversely affected by an occurrence (financial or non-financial) in another *group* entity. For instance, losses or liabilities in one entity within a *group* may result in the diversion of financial resources of other members of the *group* to that entity or otherwise lead to a depletion of the financial resources of other *group* members. Group risk includes the risk that the financial stability of a *group* may be adversely affected by events in a solo entity or by a *group*-wide occurrence. Further guidance on group risk can be found in *GENPRU* 1.2.87G to *GENPRU* 1.2.91G.

…

1.2.37 R The processes and systems required by the *overall Pillar 2 rule* must:

(1) include an assessment of how ~~it~~ the *firm* intends to deal with each of the major sources of risk identified in accordance with *GENPRU* 1.2.30R(2); ~~and~~

(2) take into account the impact of diversification effects and how such effects are factored into the *firm's* systems for measuring and managing risks; and

(3) include an assessment of the *firm*-wide impact of the risks identified in accordance with *GENPRU* 1.2.30R(2), to which end a *firm* must aggregate the risks across its various business lines and units.

…

Stress and scenario tests

1.2.42 R (1) As part of its obligation under the *overall Pillar 2 rule*, a *firm* must, for ~~each of~~ the major sources of risk identified in accordance with *GENPRU* 1.2.30R(2), carry out stress tests and scenario analyses that are appropriate to the nature of those major sources of risk.~~, as part of which the *firm* must:~~

~~(a) take reasonable steps to identify an appropriate range of realistic adverse circumstances and events in which the risk identified crystallises; and~~

~~(b) estimate the financial resources the *firm* would need in each of the circumstances and events considered in order:~~

~~(i) to be able to meet its liabilities as they fall due;~~

~~(ii) to be able to meet the *CRR*;~~

~~(iii) to carry out the plans referred to in *GENPRU* 1.2.37R (1); and~~

~~(iv) otherwise to meet, to the extent that it considers necessary, that major source of risk.~~

(2) In carrying out the stress tests and scenario analyses in (1), a ~~*BIPRU firm* with an *IRB permission*~~ must ~~incorporate and take into account the stress tests required to be carried out under *BIPRU* 4.3.39R to *BIPRU* 4.3.40R (Stress tests used in assessment of capital adequacy)~~ identify an appropriate range of adverse circumstances of varying nature, severity and duration relevant to its business and risk profile and consider the exposure of the *firm* to those circumstances, including:

(a) circumstances and events occurring over a protracted period of time, including an economic or business cycle of a severity such as might be experienced once every 25 years;

(b) sudden and severe events, such as market shocks or other similar events; and

(c) some combination of the circumstances described in (a) and (b), which may include a sudden and severe market event followed by an economic recession.

(3) ~~In carrying out the stress tests and scenario analyses in (1), a *BIPRU firm* must incorporate and take into account any other stress tests and scenario analyses that it is required to carry out under any other provision of the *Handbook*.~~ In carrying out the stress tests and scenario analyses in (1), the *firm* must estimate the financial resources that it would need in order to continue to meet the *overall financial adequacy rule* and the *CRR* in the adverse circumstances being considered.

(4) In carrying out the stress tests and scenario analyses in (1), the *firm* must assess how risks aggregate across business lines or units, any material non-linear or contingent risks and how risk correlations may increase in stressed conditions.

(5) As part of its obligation under the *overall Pillar 2 rule*, a *BIPRU firm* must also incorporate and take into account any stress tests and scenario analyses that it is required to carry out under *BIPRU*. In particular, a *BIPRU firm* with an *IRB permission* must incorporate and take into account the stress test required to be carried out under *BIPRU* 4.3.40R(2) (economic recession such as might be experienced once in 25 years).

1.2.42A G A *BIPRU firm* with an *IRB permission* which has any material credit exposures excluded from its *IRB* models should also include these exposures in its stress and scenario testing to meet its obligations under *GENPRU* 1.2.42R. A *BIPRU firm* without an *IRB permission*, or an *insurer* that has any material credit and counterparty credit risk *exposures*, should conduct analyses to assess risks to the credit quality of its counterparties, including

any protection sellers, considering both on and off-balance sheet exposures.

1.2.42B G An *insurer* may choose to carry out its *ICA* through the use of stress testing and scenario analyses (see *INSPRU* 7.1.10G and *INSPRU* 7.1.68G). If it does so, in carrying out the stress tests and scenario analyses referred to in *GENPRU* 1.2.42R, an *insurer* should take into account the stress tests it uses for its *ICA*.

1.2.42C G In carrying out the stress tests and scenario analyses required by *GENPRU* 1.2.42 R(1), a *firm* should also consider any impact of the adverse circumstances on its *capital resources*. In particular, a *firm* should consider the *capital resources gearing rules* where its *tier one capital* is eroded by the event.

1.2.42D G A *firm* should assign adequate resources to stress testing and scenario analysis, taking into account the stress testing techniques employed, so as to be able to accommodate different and changing stress tests at an appropriate level of granularity.

1.2.42E G *GENPRU* 1.2.63G to *GENPRU* 1.2.78G provide additional guidance on stress testing and scenario analyses. In particular, *GENPRU* 1.2.73G provides specific guidance on capital planning.

…

Additional guidance on stress tests and scenario analyses

1.2.63 G The *general stress and scenario testing rule* requires a *firm* to carry out stress tests and scenario analyses as part of its obligations under the *overall Pillar 2 rule*. Both stress tests and scenario analyses ~~can be~~ are undertaken by a *firm* to further a better understanding of the vulnerabilities that it faces under extreme conditions. They are based on the analysis of the impact of ~~unlikely, but not impossible, events~~ a range of events of varying nature, severity and duration. These events can be financial, operational or legal, or relate to any other risk that might have an economic impact on the *firm*.

…

1.2.67 G ~~The *general stress and scenario testing rule* requires a *firm*, as part of carrying out stress tests and scenario analyses, to take reasonable steps to identify an appropriate range of realistic circumstances and events in which a risk would crystallise. In particular:~~

~~(1) a *firm* need only carry out stress tests and scenario analyses in so far as the circumstances or events are reasonably foreseeable, that is to say, their occurrence is not too remote a possibility: and~~

~~(2) a *firm* should also take into account the relative costs and benefits of carrying out the stress tests and scenario analyses in respect the circumstances and events identified.~~ [Deleted]

…

1.2.70 G Where a *firm* is exposed to *market risk*, ~~T~~the time horizon over which stress tests and scenario ~~analysis~~ analyses should be carried out ~~should~~ will depend on, among other things, the maturity and liquidity of the *positions* stressed. For example, for the *market risk* arising from the holding of investments, this will depend upon:

…

(2) the extent to which the market in those assets is sufficiently liquid (and would remain liquid in the changed circumstances contemplated in the stress test or scenario analysis) to allow the *firm*, if needed, to sell, hedge or otherwise mitigate the risks relating to its holding so as to prevent or reduce exposure to future price fluctuations. In devising stress tests and scenario analyses for *market risk*, a *BIPRU firm* should also take into account *BIPRU* 7.1.17R to *BIPRU* 7.1.20G.

…

1.2.73 G (1) ~~A *firm* should conduct stress tests and scenario analyses which project its financial position (both profitability and balance sheet position) so as to estimate both its *capital resources* and *capital resource requirements* throughout and economic or business cycle.~~ [Deleted]

(1A) ~~For an *insurer*, these tests and analyses are in addition to those that may be used for the *ICA* (see *INSPRU* 7.1.10G and *INSPRU* 7.1.68G). Projections should be made on different bases, including ones which are consistent with the business plan, as well as others using 'realistically adverse' alternative scenarios. In considering the tests and analyses to be used for the purposes of these projections, an *insurer* should have regard to the matters mentioned below.~~

~~(a) As with the *ICA*, it is for the *insurer* to identify an appropriate range of adverse circumstances and events. As the projections are being assessed as part of business planning, the *FSA* would expect stresses and scenarios to be more likely than the extreme conditions covered by an *ICA*. As a guide, stresses and scenarios with a probability of once in a 25 year period would be useful as a reference when an *insurer* discusses projections of its financial position with the *FSA* (see also *GENPRU* 1.2.75G (3)).~~

~~(b) Business risk is likely to be a more significant feature in projecting an *insurer's* financial position than in its *ICA* (see *GENPRU* 1.2.31R and *GENPRU* 1.2.32G).~~

~~(c) The treatment of new business is likely to be different for projecting an *insurer's* financial position than in its *ICA*. In the former, this should be based on the firm's business plan, but flexed to incorporate potential changes in trading~~

~~conditions and strategy. In the latter, account should be taken of the effects of a closure to new business (see *GENPRU* 1.2.27G, *GENPRU* 1.2.73G(3) and *INSPRU* 7.1.16G to *INSPRU* 7.1.19G).~~

~~(d)~~ ~~Methods that are more approximate than used for an *ICA* may be appropriate for projecting elements of an *insurer's* financial position (e.g. the *with profits insurance capital component* for *realistic basis life firms*).~~ [Deleted]

(2) ~~A *firm* will need to consider the cycles it is most exposed to and whether these are general economic cycles or specific to particular markets, sectors or industries. The length of time over which such projections would be appropriate will therefore vary, but typically might be between three and five years.~~ [Deleted]

(3) ~~The projections should be based on the *firm's* business plan, but flexed to incorporate adverse trading conditions and any changes in strategy which the *firm* could and would take in response to those, conditions~~. [Deleted]

(4) ~~Changes in strategy might be necessary for instance because capital needed to be able to continue its business at existing volumes is eroded. A *firm* may also alter its capital management strategy to restrict distributions of profits or to raise additional capital. The combined effect on capital and retained earnings should be estimated. A *firm* should document how it would react to such economic and business risks.~~ [Deleted]

(5) ~~The *FSA* will take the projections referred to in this paragraph and the plan referred to in (4) into account as part of its *SREP*. The purpose of examining them is to enable the *FSA* to judge, at an appropriate level of certainty, whether the *firm* will be able to meet its obligations throughout a recession.~~ [Deleted]

Capital planning

1.2.73A G (1) In identifying an appropriate range of adverse circumstances and events in accordance with *GENPRU* 1.2.42R(2), a *firm* will need to consider the cycles it is most exposed to and whether these are general economic cycles or specific to particular markets, sectors or industries. For the purposes of *GENPRU* 1.2.42R(2)(a), the amplitude and duration of the relevant cycle should be that which would be expected of a cycle of a severity such as might be experienced once in 25 years.

(2) In making the estimate required by *GENPRU* 1.2.42R(3), a *firm* should project both its *capital resources* and its required *capital resources* over a time horizon of 3 to 5 years, taking account of its business plan and the impact of relevant adverse scenarios. In making

the estimate, the *firm* should consider both the *capital resources* needed to meet its *CRR* and the *capital resources* needed in order to adequately cover its major sources of risk as identified in accordance with *GENPRU* 1.2.30R(2). The *firm* should make these projections in a manner consistent with its risk management processes and systems as set out in *GENPRU* 1.2.37R.

(3) In projecting its financial position over the relevant time horizon, the *firm* should:

(a) reflect how its business plan would "flex" in response to the adverse events being considered, taking into account factors such as changing consumer demand and changes to new business assumptions;

(b) estimate the effects on the *firm's* financial position of the adverse event without adjusting for management actions;

(c) separately, identify any realistic management actions that the *firm* could and would take to mitigate the adverse effects of the stress scenario; and

(d) estimate the effects of the stress scenario on the *firm's* financial position after taking account of realistic management actions.

(4) A *firm* should identify any realistic management actions intended to maintain or restore its capital adequacy. These could include ceasing to transact new business after a suitable period has elapsed, balance sheet shrinkage, restricting distribution of profits or raising additional capital. A *firm* should reflect management actions in its projections only where it could and would take such actions, taking account of factors such as market conditions in the stress scenario and any effects upon the *firm's* reputation with its counterparties and investors. The combined effect on capital and retained earnings should be estimated. In order to assess whether prospective management actions in a stress scenario would be realistic and to determine which actions the *firm* would and could take, the *firm* should take into account any preconditions that might affect the value of management actions as risk mitigants and analyse the difference between the estimates in (3)(a) and (3)(d) in sufficient detail to understand the implications of taking different management actions at different times, particularly where they represent a significant divergence from the *firm's* business plan.

(5) For an *insurer*, the treatment of new business when making capital projections is likely to be different from its *ICA*. In projecting its financial position, an *insurer* should take account of new business based on the *firm's* business plan, but flexed to take account of potential changes in trading conditions and strategy. When assessing its current capital adequacy under its *ICA*, an *insurer* should take

account of the effects of closure to new business (see *GENPRU* 1.2.27G, *GENPRU* 1.2.73AG(3) and *INSPRU* 7.1.16G to *INSPRU* 7.1.19G). Also, an *insurer* may use methods that are more approximate than used for its *ICA* (for example, in projecting the *with-profits insurance capital component* for *realistic basis life firms*).

(6) A *firm* should document its stress test projections and policies in a management plan approved by the *firm's* senior management or *governing body*. The stress testing management plan should be incorporated as part of the *firm's ICAAP* or *ICA*, as applicable.

(7) The *FSA* will take the *firm's* plan referred to in (6) into account as part of its *SREP*. The purpose of examining it is to enable the *FSA* to judge, at an appropriate level of certainty, whether a *firm* will be able to continue to meet its obligations through the projection period.

(8) If, after taking account of realistic management actions, a *firm's* stress testing management plan shows that the *firm's* projected *capital resources* are less than needed to continue to meet its *CRR* or adequately cover its risks identified in accordance with *GENPRU* 1.2.30R(2) over the projection period, the *FSA* may require the *firm* to set out additional countervailing measures and off-setting actions to reduce such difference or to restore the *firm's* capital adequacy after the stress event.

…

1.2.75 G (1) ~~A *firm* should assess the nature and severity of the economic recession or business cycle changes which are relevant to it given the nature and scale of its business. When projecting its *capital resources* and *CRR*, a *firm* should consider a range of stresses and scenarios both in nature and severity.~~ [Deleted]

(2) Stress and scenario analyses should, in the first instance, be aligned with the risk appetite of the *firm*, as well as the nature and complexity of its business. ~~and the~~ The calibration of ~~such~~ the stress and scenario analyses should be reconciled ~~back~~ to a clear statement setting out the premise upon which the *firm's* internal capital assessment under the *overall Pillar 2 rule* is based.

(3) ~~A firm with an *IRB permission* should ensure that the range of stresses and scenarios considered encompasses the severity of recession specified in *BIPRU* 4.3.40R (Stress tests used in assessment of capital adequacy), which is one that might be expected to occur once in a 25 year period. Other *firms* may also find that this is a useful reference point when discussing their assessments with the *FSA*.~~ [Deleted]

(4) ~~A *firm* may also consider scenarios in which the amount of capital it currently holds would be exhausted. This would provide useful information about the reasonableness or remoteness of such scenarios arising. Where a *firm* uses capital models as part of its risk management processes, considering the sensitivity of model results to variations around the most likely ruin scenario focuses testing on the most relevant scenarios.~~ In identifying adverse circumstances and events in accordance with *GENPRU* 1.2.42R(2), a *firm* should consider the results of any reverse stress testing conducted in accordance with *SYSC* 19. Reverse stress testing may be expected to provide useful information about the *firm's* vulnerabilities and variations around the most likely ruin scenarios for the purpose of meeting the *firm's* obligations under *GENPRU* 1.2.42R. In addition, such a comparison may help a *firm* to assess the sensitivity of its financial position to different stress calibrations.

…

Pension obligation risk

1.2.79 G *GENPRU* 1.2.80G ~~–~~ to *GENPRU* 1.2.86G contain *guidance* on the assessment required by *GENPRU* 1.2.30R(2)(k) ~~(Pension risk)~~ for a *firm* exposed to pension obligation risk as defined in *GENPRU* 1.2.31R(5).

1.2.80 G The pension scheme itself (i.e. the scheme's assets and liabilities) is not the focus of the risk assessment; it is the *firm's* obligations towards the pension scheme which is. A *firm* should include in its estimate of financial resources both its expected obligations to the pension scheme and any increase in obligations that may arise in a stress scenario.

…

1.2.82 G A *firm* should also assess the risks that may increase its current funding obligations towards the pension scheme and that might lead to the *firm* not being able to pay its other liabilities as they fall due.

…

1.2.83A G *Firms* are expected to determine where the scope of any stress test impacts upon its pensions obligation risk and estimate how the relevant measure of pension obligation risk will change in the scenario in question. For example, in carrying out stress tests under *GENPRU* 1.2.42R a *firm* must consider how a stress scenario, such as an economic recession, would impact on the *firm's* current and potential increase in obligations towards its pension scheme. Risks such as interest rate risk or reduced investment returns may have a direct impact on a *firm's* financial position as well as an indirect impact resulting from an increase in the *firm's* pension scheme obligations. Both effects should be taken into account in a *firm's* estimate of financial resources under *GENPRU* 1.2.30R.

…

Additional guidance on group risk

1.2.87 G *GENPRU* 1.2.88G to *GENPRU* 1.2.91G contain additional *guidance* on the assessment required by *GENPRU* 1.2.30R(2)(l) (Group risk).

1.2.88 G A *firm* should include in the written record referred to in *GENPRU* 1.2.60R a description of the broad business strategy of the *group* of which it forms part, the *group's* view of its principal risks and its approach to measuring, managing and controlling the risks. This description should include the role of stress testing, scenario analysis and contingency planning in managing risk at the solo and *group* level.

1.2.89 G A *firm* should satisfy itself that the *group's* systems (including IT) are sufficiently sound to support the effective management and, where applicable, the quantification of the risks that could affect its *group*.

1.2.90 G In performing stress tests and scenario analyses, a *firm* should take into account the risk that its *group* may have to bring back on to its consolidated balance sheet the assets and liabilities of off-balance sheet entities as a result of reputational contagion, notwithstanding the appearance of legal risk transfer.

1.2.91 G A *firm* should carry out stress tests and scenario analyses to a degree of sophistication which is commensurate with the complexity of its *group* and the nature of its group risk.

## Annex D

## Amendments to the Prudential sourcebook for Banks, Building Societies and Investment Firms (BIPRU)

In this Annex, underlining indicates new text and striking through indicates deleted text.

2.2.16 G If the *FSA* gives *individual capital guidance* to a *firm*, the *FSA* will state what amount and quality of capital the *FSA* considers the *firm* needs to hold in order to comply with the *overall financial adequacy rule*. It will generally do so by saying that the *firm* should hold *capital resources* of an amount which is at least equal to a specified percentage of that *firm's capital resources requirement*. Such amount should be sufficient to enable the *firm* to continue to meet the *overall financial adequacy rule* in the face of the adverse circumstances and events to which *GENPRU* 1.2.42R(2) refer.

…

2.2.25 G (1) This paragraph applies to a small *firm* whose activities are simple and primarily not credit related.

…

(4) A *firm* should conduct stress tests and scenario analyses in accordance with *GENPRU* 1.2.42R to assess how that *firm's* capital and *CRR* would alter and what that *firm's* reaction might be to a range of adverse scenarios, including operational and market events. Where relevant, a *firm* should also consider the impact of ~~an~~ a severe economic or industry downturn, such as might be experienced once in 25 years, on its future earnings, *capital resources* and *capital resources requirements*, taking into account its business plans.

2.2.26 G In relation to a *firm* whose activities are moderately complex, in carrying out its *ICAAP*, *BIPRU* 2.2.25G(3) to (4) apply. In addition, it could:

…

(7) assume that business does not develop as expected and consider how that *firm's* capital and *CRR* would alter and what that *firm's* reaction to a range of adverse economic scenarios might be (see *GENPRU* 1.2.30R to *GENPRU* 1.2.43G (the *overall Pillar 2 rule* and related *rules* and *guidance*); where appropriate, the adverse scenarios should consider the impact of market risk events that are instantaneous or occur over an extended period of time but which are nevertheless still co-dependent on movements in economic conditions;

…

…

2.3.9 G For a larger and/or more complex *firm*, appropriate systems to evaluate and manage interest rate risk in the *non-trading book* ~~may~~ should include:

(1) the ability to measure the exposure and sensitivity of the *firm's* activities, if material, to repricing risk, yield curve risk, basis risk and option risk (for example, pipeline risk, repayment risk) as well as changes in ~~the shape of the yield curve, changes between different market rates (i.e. basis risk) and changes to~~ assumptions (for example, those about customer behaviour);

…

…

4.3.39A G The *FSA* expects that *firms* will routinely make use of stress testing and scenario analysis as a tool in the calibration and/or validation of their IRB parameters in order to increase the accuracy or, at least, the conservatism of the estimates. Stress testing should include a thorough exploration of various outturns different to the *firm's* normal expectations in order to give the *firm* a clear view of the potential for the forward-looking estimate to be different from that indicated by the primary data source(s). *Firms* should consider this as an integral part of their quantification process, and should have clear standards for how the results of the stress tests affect the final estimates used for the IRB parameters.

…

5.2.9 R A *firm* must be able to satisfy the *FSA* that it has adequate risk management processes to control ~~those~~ the risks to which the *firm* may be exposed as a result of carrying out *credit risk mitigation*. Those processes must include appropriate stress tests and scenario analyses relating to those risks, including residual risk and the risks relating to the intrinsic value of the *credit risk mitigation*.

[**Note:** *BCD* Annex VIII Part 2 point 1]

…

5.4.53 R A *firm* must take into account the illiquidity of lower-quality assets. The liquidation period must be adjusted upwards in cases where there is doubt concerning the liquidity of the collateral. A *firm* must also identify where historical data may understate potential volatility, e.g. a pegged currency. Such cases must be dealt with by means of ~~a~~ stress scenario assessments.

…

…

5.6.19A G This paragraph provides guidance in relation to *BIPRU* 5.6.19R(8). In carrying out the stress testing programme, *a firm* should evaluate the

simultaneous impact of individual stress scenarios on its *counterparty exposures*, its *positions* and the aggregate amount of margin calls that it would receive. A *firm's* stress scenarios should take into account the possibility that the liquidation period may be substantially longer than 5 days for *repurchase transactions* and *securities lending* or *borrowing transactions*, and 10 days for other types of *securities financing transactions*.

…

Stress testing and scenario analyses of trading book positions

7.1.17 R A *firm* must conduct a regular programme of stress testing and scenario analysis of its *trading-book positions*, both at the trading desk level and on a *firm*-wide basis. The results of these tests must be reviewed by senior management and reflected in the policies and limits the *firm* sets.

7.1.18 R In carrying out the stress tests and scenario analyses required by *BIPRU* 7.1.17R, a *firm* must incorporate and take into account any other stress tests and scenario analyses that it is required to carry out under any other provision of the *Handbook*, and in particular under *BIPRU* 7.10.72R where the *firm* has a *VaR model permission*.

7.1.19 G This paragraph gives guidance in relation to the stress testing programme that a *firm* must carry out in relation to its *trading book positions*.

(1) The frequency of the stress testing of *trading book positions* should be determined by the nature of the *positions*.

(2) The stress testing should include shocks which reflect the nature of the portfolio and the time it could take to hedge out or manage risks under severe market conditions.

(3) The *firm* should have procedures in place to assess and respond to the results of the stress testing programme. In particular, stress testing should be used to evaluate the *firm's* capacity to absorb losses or to identify steps to be taken by the *firm* to reduce risk.

(4) As part of its stress testing programme, the *firm* should consider how prudent valuation principles (see *GENPRU* 1.3) will be met in a stressed scenario.

7.1.20 G The stress testing and scenario analysis under *BIPRU* 7.1.17R should be taken into account under the *overall Pillar 2 rule*.

…

Risk management standards: Stress testing

7.10.72 R (1) A *firm* must frequently conduct a rigorous programme of stress testing. The results of these tests must be reviewed by *senior*

*management* and reflected in the policies and limits the *firm* sets.

(2) The programme must particularly address:

…

(g) … ; ~~and~~

(h) ~~other risks that may not be captured appropriately in the *VaR model* (for example, recovery rate uncertainty, implied correlations and skew risk)~~ full revaluation, or a reliable approximation, of positions;

(i) instant shocks as well as effects of longer term periods of stress;

(j) calibration changes under stressed conditions;

(k) secondary risk factors;

(l) basis risk;

(m) systemic and localised stresses; and

(n) other risks that may not be captured appropriately in the *VaR model* (for example, recovery rate uncertainty, implied correlations and skew risk).

…

…

7.10.73A G The *firm's* stress testing programme should be comprehensive in terms of both risk and *firm* coverage, and appropriate to the size and complexity of *trading book positions* held.

…

9.1.8A G (1) The *FSA* expects *firms* to conduct regular stress testing in relation to their *securitisation* activities and off-balance sheet *exposures*. The stress tests should consider the *firm*-wide impact of those activities and *exposures* in stressed market conditions and the implications for other sources of risk, for example, credit risk, concentration risk, counterparty risk, *market risk*, *liquidity risk* and reputational risk. Stress testing of *securitisation* activities should take into account both existing securitisations and pipeline transactions, as there is a risk that these would not be completed in a stressed market scenario.

(2) The frequency and extent of the stress testing should be determined by the materiality of the *firm's securitisation* activities and off-balance sheet *exposures*.

(3) A *firm* should have procedures in place to assess and respond to the results produced from the stress testing and these should be taken into account under the *overall Pillar 2 rule*.

## Annex E

## Amendments to the Prudential sourcebook for Insurers (INSPRU)

In this Annex, underlining indicates new text and striking through indicates deleted text.

7.1.9A G This section sets out in greater detail the approach to be taken by a *firm* when carrying out the assessment of capital described in the preceding paragraph. This is the assessment referred to as an *individual capital assessment*. ~~The *rules* in *GENPRU* 1.2 also (see *GENPRU* 1.2.30R (1)(c)) require a *firm* to identify and assess risks to its being able to meet its *CRR* in the future.~~ *GENPRU* 1.2.42R is a general requirement for a *firm* to carry out stress tests and scenario analyses considering an appropriate range of adverse circumstances and events relevant to the *firm's* business and risk profile and to estimate the financial resources it would need to continue to meet the *overall financial adequacy rule* in the stress scenarios considered. As part of its obligations under *GENPRU* 1.2.42R, the *firm* must carry out stress tests and scenario analyses to estimate the financial resources it would need to support its business plans and continue adequately to cover its major sources of risk and its *CRR* over a time horizon of 3 to 5 years. This is a separate requirement from that to carry out an *ICA*, and *guidance* on this requirement is provided in *GENPRU* 1.2.73G. In particular, *firms* should note that there is no requirement that the level of capital required as identified by the *ICA* should be equal to, or exceed, the *CRR*.

…

7.1.10 G ~~*GENPRU* 1.2.42R requires a *firm* to carry out stress tests and scenario analyses for each of the major sources of risk identified in accordance with *GENPRU* 1.2.30R.~~ A *firm* may ~~also~~ choose to ~~approach~~ carry out its *ICA* ~~the assessment of the adequacy of its capital resources~~ in another way than through the use of stress tests and scenario analyses. The method should be proportionate to the size and nature of its business.

…

7.1.68 G ~~A~~ Where a *firm* ~~may choose~~ chooses to carry out ~~the assessment of the adequacy of capital resources~~ its *ICA* through the use of stress testing and scenario analyses (~~noting that *GENPRU* 1.2.42R requires stress tests and scenario analyses to be undertaken to determine the overall financial adequacy of a *firm's* financial resources. Where used,~~ such testing should reflect the potential range of outcomes for the risk being quantified, consistent with the prescribed confidence level for the *ICA*.

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