Proposed Guidance on Stress Testing for Banking Organizations with More than $10 Billion in Total Consolidated Assets

29 July 2011

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July 29, 2011

Response to the Agencies' request for comments on the document for Proposed Guidance on Stress Testing for Banking Organizations with more than $10 Billion in Total Consolidated Assets.

Dear Jennifer J. Johnson,

We have been steadily devoting significant effort into understanding the development of best practice and regulations for risk management. As a matter of fact, our prime interest is to provide our clients with systems and solutions that effectively address the needs of risk-taking institutions, favour risk awareness, assessment and management, support good decisions and help complying with regulatory requirements.

In the same vein, we have aimed at contributing to the development of methodologies and practices for effective risk management as a responsibility. The documentation we have produced since 2007 on liquidity risk management should be seen as a step in this direction. This includes:

- Two White papers on Recent Liquidity Risk regulations, Basel III and Dodd-Frank, 2010 and 2011 respectively.
- Two White Papers on Liquidity Risk published in the early stages of the crisis; December 2007;
- The response to the Basel Committee Consultative Paper: Proposed Enhancement to the Basel II Framework, April 2009;
- The response to the Financial Services Authority Consultative Paper CP 09/13 on Strengthening Liquidity standards.
- The response to the Basel Committee Consultative Document: International Framework for liquidity risk measurement, standards and monitoring, April 2010.
- Articles in our corporate magazine Th!nk.

Please see the reference section at the end of this document for details.

Following up in this spirit, we respectfully submit the following suggestions as a response to your request for comments to the document: Proposed Guidance on Stress Testing for Banking Organizations with More than $10 Billion in Total Consolidated Assets.

During our response, we will use the name “Agencies” to refer to all three agencies, the Office of the Comptroller of the Currency (OCC), the Board of Governors of the Federal Reserve System (“Board” or “Federal Reserve”) and the Federal Deposit Insurance Corporation (FDIC).

Firstly, we will start with an introduction and a high level summary of what we think are the main points in the stress testing document that require greater attention. In the second section, we will demonstrate our suggestions on these principles and what further explanation we think is required when writing the final stress testing requirements. Continuing, we will set forth our recommendations on the stress testing approaches by emphasizing the importance of enterprise-wide and reverse stress testing. Before concluding, we will discuss the weight of considering other international principles when writing stress testing requirements in order to avoid regulatory arbitrage and we will conclude our response by giving some additional more general recommendations that we believe might give more clarity in the building a stress testing framework.

1. Introduction

The recent market failure has shown the importance of stress testing in the prudential risk management of a firm. Since the stress testing that currently was in place had failed to consider the extent and the dynamic effects of changes in the external environment the result was apparent. We saw the failure of firms who pursued business plans that became unsustainable as wider market and economic conditions changed. In addition, we observed the need of firms to raise additional capital at a time of low market confidence and the difficulties and increased costs that some experienced.

The principles proposed in the document witness an effort from the three “Agencies” to achieve a higher degree of harmonization among the stress testing frameworks incorporated by institutions in the US and also reduce the probability of firms failing and the consequent impact and wider costs of any financial failure.

In this context however, we note that stress testing requirements remain at a high level left to each institution and there might be substantial differences between stress testing requirements across different organizations due to the nature of their banking activities.

In this Proposal, the "Agencies" stated that the four main stress testing principles that all institutions should have in mind when building their stress testing framework are:

- Principle 1:

  It should cover the full set of material activities, exposures and risks whether on- or off- balance sheet. In addition, it should be applied at various levels in the organizations such as business line, portfolio and risk type and tailored at the relevant level of aggregation.

- Principle 2:

  It should employ multiple conceptually sound stress testing activities and approaches and all stress testing assumptions should be properly documented.

- Principle 3:

  It should be sufficiently dynamic and flexible to incorporate changes in an organization's on- and off- balance sheet activities, portfolio composition, business strategy and any risk that may arise. Furthermore, it should be flexible to conduct new or ad-hoc stress tests in a timely manner to address rapidly emerging risks.

- Principle 4:

  The results derived from stress testing should be clear, actionable, well supported and inform decision-making. In general, stress test assumptions must be reviewed regularly by management in order to determine the validity of the scenario assumptions and the reasonableness of the results.

2. Comments on General Stress Testing Principles

In general, we support the "Agencies" objective for introducing the four above mentioned principles on stress testing.

We have the following general comments/suggestions about the proposed principles:

- Institutions must be wise when choosing the various assumptions and measures of their stress testing framework since these can differ vastly among institutions with different activities and contexts. Even more importantly, institutions should consider the impact of these assumptions on local credit conditions since these can vary a great deal. In general, the "Agencies" have

adopted a prudent approach by stating that "a banking organization should develop and implement its stress testing framework in a manner commensurate with its size, complexity, business activities and overall risk profile." However, we believe that this approach gives institutions a large degree of freedom that can enable them to lessen the impact of their stress testing assumptions. We believe that some standard stress coefficients or models should be suggested by the "Agencies" as benchmark for the stress testing framework of institutions. The following IMF suggestions can be considered as examples.

- According to the IMF's stress testing suggestions a proper stress testing framework should consider the following three events:
  - A stressed macro and financial environment leading to a reduction in funding from the unsecured funding markets due to a heightened perception of counterparty and default risk
  - Banks during stressed conditions seek to meet their cash flow obligations using fire sale of assets. Fire sales always lead in decreasing asset prices which affect asset valuations and margin requirements for all banks in the system and these in turn affect funding costs, profitability and generate systemic solvency concerns.
  - The uncertainty over counterparty risk and lower asset valuations encourages banks and investors to maintain increased liquidity and therefore lower funding of liquidity is observed. This at the end results in systemic liquidity shortfalls.
- In addition, we believe that disclosure should be provided regarding how interactions between stress assumptions and the instruments to which they apply are factored in the definition of stress coefficients. For instance, if there is an assumption of rating downgrade on a certain class of marketable instruments, this assumption should also be reflected in the haircut applicable to that class of instruments. Not properly considering interactions can lead to underestimated potential exposures in stress times and eventually to insufficient or ineffective mitigation actions.
- It is advised that banking organizations should have appropriate management information systems (MIS) and data processes that enable it to collect, sort, aggregate and update data and other information. This however, will enforce costs on institutions since they will have to update their Information Systems or in cases where MIS are not in place, they will need to implement them. The economic burden for this will be significant for institutions, especially for smaller

organizations. If, in fact, the upcoming new rules were intended to stop the problem of *too-big-to-fail*, ironically, the unintended consequence may be that some banks will be *too-small-to-survive* the onslaught of the upcoming rules. On top of that institutions should consider the costs of IT expertise who will be in charge of managing and maintaining IT infrastructures.

3. Comments on Stress Testing Approaches and Applications

In general, we fully support the approach that the "Agencies" are adopting for the four stress tests applications mentioned in the document, namely scenario analysis, sensitivity analysis, enterprise-wide stress testing and reverse stress testing. We are in complete agreement with the importance given to scenario analysis and sensitivity analysis. However, we believe that further details should be given to institutions about what information is expected from them to include when choosing their scenarios. This will help clarify the scene and avoid discrepancies among institutions and regulators.

Some elements we find necessary for institutions to have in mind when preparing their scenarios are:

- They should address all risk types and factors that are applicable to the activities of their institution with great focus on financial, namely asset and liability management, credit risk, market risk, operational risk and liquidity risk, and non financial risks.
- The scenarios should consider a sequence of events and not assume that events occur in isolation.
- The scenarios should contain a tale that includes various events that can trigger the institution's failure.
- The scenarios should address all firm-specific susceptibilities, including specific product or business-line exposures and concentrations, up to the legal entity level.

We would like to discuss the two remaining stress testing applications in a bit more detail. The concepts of enterprise-wide stress testing and the reverse stress testing have emerged as a result of the 2007 financial crisis and are continuously proving to be extremely important and necessary for a complete risk management framework.

3.1. Enterprise-Wide Stress Testing

This should be of primary focus for both banking organizations and regulators. Stress testing should no longer speak in terms of *siloed risks* but instead consider a more integrated approach.

Most financial institutions have in place today siloed risk systems that look either at the risk of the product such as Market Risk, ALM, and Liquidity Risk or at the risk inherent to the counterparty, such as for example Credit Risk as shown in figure 1 below.

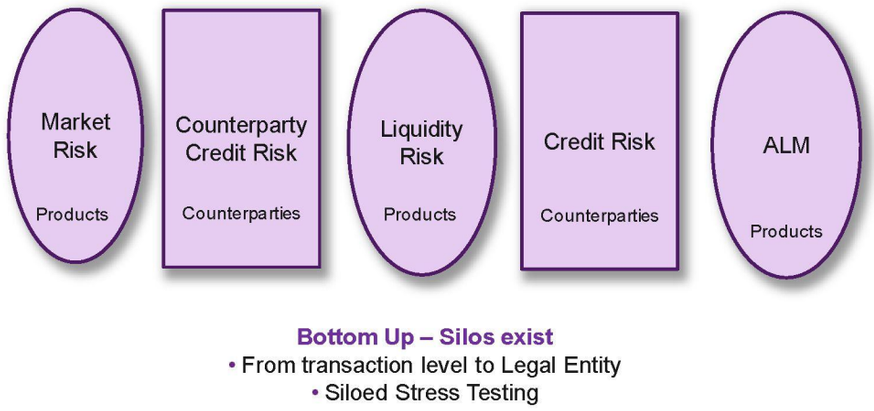

Figure 1 Bottom Up Silos Risk Framework

In reality, financial institutions trade *a product with a counterparty*, therefore to analyse synergies and avoid risk of duplication and double counting, financial institutions should use enterprise risk systems or set up appropriate enterprise risk frameworks that will allow the analysis of risks financial institutions face when they trade a product with a counterparty. Using this view it is possible to break the "silos" perspective and allow a much more efficient decision making process that exploits the risk-return value by creating strategies more adherent to real world business applications for best risk management practices as shown in figure 2 below.

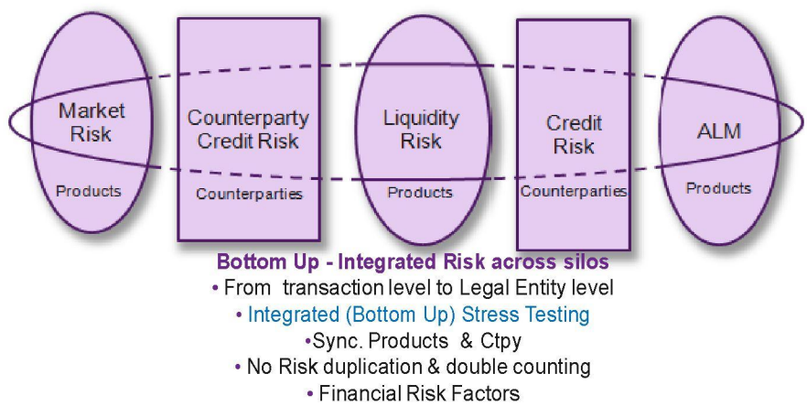

Figure 2. Bottom Up Integrated Risks Across Silos

The best approach to capture this integration among risks and to avoid double counting is by using a top down – bottom up integrated & enterprise-wide stress testing approach. Bottom up testing is where the lowest level financial risk factors are tested first and then used to facilitate testing of higher level components, until the enterprise-wide level of the institution is being reached. The top down approach is where financial and non financial risk factor testing and coefficients *integrated* testing begins from the enterprise-wide level and then descends to individual legal entities, business lines and portfolio levels of the institution. The approach that all regulators are now trying to adopt is an integrated version of both bottom-up and top-down stress tests in order to achieve an enterprise-wide risk management framework which can support management decisions on an enterprise-wide basis by integrating all relevant risk components. Consecutively, banking institutions will need to evolve beyond traditional risk measurement reports and synchronize their senior management processes with the risk control activities occurring at lower levels and within various business units.

A step towards endorsing this enterprise risk framework is the correct selection of scenarios. It is extremely important that the scenarios are defined jointly across the organization so that each scenario has a consistent interpretation across ALM, liquidity, credit, market and operational risk. Interesting to note at this stage is that Basel III's guidelines for stress testing do not talk in terms of siloed risk types, and rightly so because economic stress testing cuts across financial risks. But still the critical link/trade-off between financial and non financial risks observed from an integrated bottom up and top down perspective is not captured. We will illustrate this key enhancement in the next paragraphs.

The aim of the regulators is to incorporate integrated stress test results into capital adequacy considerations and enable practitioners to analyze the early warning signals for each of the integrated risks but also from a best practice enterprise risk management perspective. It is generally important to ensure that the organizations' risk appetite is broadly defined by senior management and then adhered to the business units. It is also very important that institutions are able to identify key non financial risks such as systemic, reputation and regulatory which are not captured by the traditional risk silos and incorporate them in their stress testing framework.

We are aware that taking an integrated view of risk and building the various stress scenarios will not be an easy task for financial institutions since most of risk applications and reporting procedures occurring at the moment are silo based. It is in fact difficult both methodologically and technologically linking together stress tests across risk types. Therefore we recommend that the "Agencies" will provide more detailed guidelines on how to achieve this key objective. However, we would like to give our recommendations on how to best approach this.

To begin with, integrated enterprise-wide stress and scenario analysis should be performed using deterministic, semi-deterministic and stochastic scenario-based planning framework at different points in time depending on the type of non-financial and/or financial risk factors being considered. These scenarios should be defined jointly across the organization so that each scenario has a consistent interpretation and more importantly the consequences of each of them are evaluated both from a single silo and at enterprise level. On top of that we strongly recommend having firm-wide, dynamic indicators that are dynamically linked with financial and risk data flowing within the organization on a continuous basis. The objective here is to close the loop for decision-making, planning, and monitoring activities based on both top-down and bottom-up perspective, as illustrated in figure 3 below.

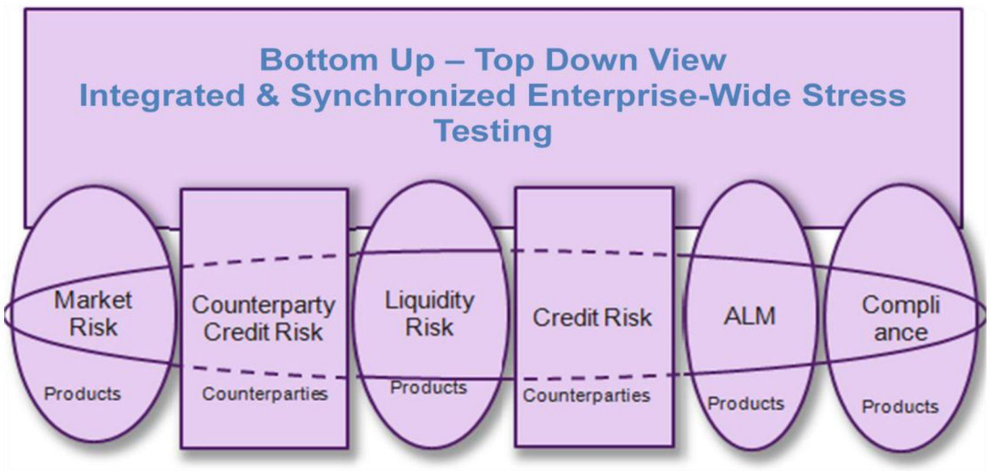

Figure 3 Bottom-Up & Top-Down ERM

As it is possible to infer from the picture it is crucial that the integrated risk considerations which have been gathered at top down level are then communicated in a consistent manner to the various legal entities and business units down to at least portfolio level using scenarios and risk factors which are, whenever possible *the same, jointly defined and* used in both top down and bottom up framework; otherwise it becomes impossible to communicate risk considerations to the business entities and the treasury department. This will avoid incurring into model risk and thus avoiding unintended actions in terms of hedging or risk taking.

A significantly important element for achieving a proper integrated enterprise-wide stress testing framework is to ensure a collaboration of different senior experts within the organization such as risk and finance department, business experts, treasury, strategy planners, cost control, internal auditors and should be managed and supervised by the CRO and CFO.

Another element that will turn out to be extremely helpful to financial institutions is the build of a unified risk and finance data model. The best practice for designing this unified risk technology architecture is to ensure that finance and risk technologies are sufficiently allied with the needs of the business. In particular, alignment of finance with risk measures, consolidation of fragmented risk, finance and treasury applications and finally the decrease in interfaces which make processing more complicated and the reconciliation efforts even harder are just some of the possible options for institutions to achieve this.

Finally, we would like to stress the tradeoffs between efficiency and other value drivers which might come as a consequence of this convergence between risk and finance. It is something which needs to be carefully considered, both by institutions and regulators. The depth of this convergence is a firm's decision and based on their banking activities and the complexity of their operations they can either aim for a bare minimum convergence with manual data integration, or "balanced" approaches with separate risk and finance applications which have automated interfaces, or even a full integration into a single risk and finance system/data model, which should be the aim of major financial institutions.

3.2. Reverse Stress Testing

In terms of reverse stress testing, we agree that its implementation is extremely important and it can provide additional useful information to management that can be used to improve contingency planning and management of business failure. However, we do have some comments/suggestions to provide regarding the reverse stress testing approach.

Primarily we most certainly agree that reverse stress testing should definitely be considered as an important risk management tool for a banking organization. However, we believe that further analysis should be given by the "Agencies" regarding their expectations with respect to a reverse stress test analysis since their intentions were not apparent in the document.

It is our opinion that further explanation should be given regarding how the results derived from the organizations' reverse stress tests will be used by the supervisors and whether they will be used to set individual guidance.

Despite the benefits deriving from the reverse stress testing when used as a risk management tool, institutions will run the danger of becoming swamped by the numerical analysis required to implement it. By introducing reverse stress testing, regulators are running the danger of increasing capital requirements. In the case where supervisors choose to use reverse stress tests results to set individual capital and liquidity standards by requiring from banking institutions to hold adequate capital to

withstand the impact of such a scenario, the capital increase will be an inevitable outcome. Capital levels are already at a first time high level, especially for systemic institutions due to Basel III and Dodd-Frank capital requirements and therefore putting greater pressure on them might have an even worst impact on profits. In addition, we are facing the danger that institutions might choose to adopt scenarios that do not lead to significant capital increase in order to avoid increasing the standards set by the regulators. This means that institutions will not perform appropriate stress testing and will not take into account all worst case scenarios.

Furthermore, we believe that the "Agencies" should provide details on the level where reverse stress test should be conducted. It might make more sense for reverse stress test to be conducted at group level since costs involved in conducting them at business units would be significantly higher and the benefits of doing so are unclear as they would depend upon each firm's organisational and legal structure.

Similar to the issue raised above on the level upon which stress testing will be conducted, the "Agencies" should consider whether institutions operating internationally, outside the US are expected to report their stress testing results to the US regulations.

Finally, the regulators when writing the final rules on reverse stress testing should take into consideration that most banking institutions do not have a reverse stress test framework implemented at the moment. This means that the industry might need several years to build a proper framework that is fully integrated with the overall stress testing framework of each institution and therefore supervisors should allow for sufficient time for this to be incorporated.

4. Endorsement of Basel III

In this section, we would like to urge you to exemplify how the stress testing principles outlined in this document will endorse the Basel approach outlined in the Basel III document Principles for sound stress testing practices and supervision and in general the guidelines given by other jurisdictions. Ignorance of stress testing guidelines by other jurisdictions will most probably end in regulatory arbitrage which might disfavour the US institutions. In particular, stress tests that may lead to additional capital for firms may restrict their ability to manage capital effectively, suppress competition and adversely affect the US economy.

Regulatory arbitrage has already started to appear in the US and it disfavours US institutions since major regulations being endorsed through Dodd-Frank are seriously harming US banking activities. The

endorsement of the Volcker Rule and its proprietary limits or the swap push out section of Dodd-Frank, where nothing similar is being implemented in Europe or anywhere else in the world are only some of the cases where regulatory arbitrage already exists. Building the US stress testing guidelines without considering European and International regulators will most probably result in even higher level of regulatory arbitrage since its existence through Dodd-Frank is already inevitable.

The importance of stress testing is obvious in all major regulations since they all urge institutions to include results obtained from stress testing in decision-making at senior management level and then use them to promote risk identification and control, improve capital and liquidity management and finally enhance internal and external communication. However, the depth at which regulators would like to see the stress testing results being taken into consideration when setting appropriate capital standards is not yet determined and it is at this point where regulatory arbitrage might arise.

As a result of the recent crisis regulators around the world are enforcing the need that stress testing should be used as a major risk management tool. In this way banks will be aware of adverse unexpected outcomes related to a variety of risks. It is a general concept that whilst stress testing can indicate appropriate capital levels necessary to withhold severe economic conditions, it can also help in the mitigation of increasing risk levels. The table below summarizes what we describe in this section and proves that stress testing guidelines outlined in this document seem to be compatible with the ones published by the Basel Committee and the UK regulator, FSA. For example, the robust stress testing infrastructure that institutions should put in place or the reverse stress testing procedures that they should incorporate in their stress testing frameworks are some of the main elements regulators are emphasizing. However, we would like to give some recommendations on issues which have been omitted in this document and which we feel that their consideration might aid in avoiding the increase of regulatory arbitrage and easing the creation of proper stress testing frameworks.

Stress Testing Principles	*Basel*	*FSA*	*"The Agencies"*
ST should be used as a key risk management tool.	✓	✓	✓
ST should play an important role in the firm's decision-making process.	✓	✓	✓
A robust stress testing infrastructure should be in place with appropriate IT systems and resources.	✓	✓	✓
All firms should have clearly documented policies and procedures, i.e. scenarios and assumptions should be clearly documented. However, they should be able to perform ad-hoc analysis even if this is not	✓	✓	✓

documented.			
Reverse stress testing should be a key component of a firm's stress testing framework.	✓	✓	✓
Integrated stress testing is incredibly crucial in a proper stress testing framework, with major importance placed on capital and liquidity integration.	✓	✓	✓
Regulators might need to create common supervisory scenarios that banks will have to report in order to assess specific operations or compare results among institutions.	✓	✓	
Action must be taken by regulators if material deficiencies are identified in the stress testing framework.	✓		

We strongly believe that it will be supportive if "the Agencies" create minimum common scenarios which all organizations will need to incorporate on top of their current stress testing programmes. These scenarios must capture similar characteristics and reveal similar risks as the ones in the Basel III and FSA scenarios. This will enable the "Agencies" to compare results among organizations with similar banking activities both at local and international level, assess the impact of specific stress events and therefore set proper capital and liquidity standards and avoid regulatory arbitrage.

In addition, we believe that you should regularly assess the organizations' stress testing frameworks and all documentation that they create together with all assumptions and results obtained in order to ensure that institutions remain compliant with the principles and guidelines offered in this document and in documents of international regulators. On top of that you should be able to take corrective action if you discover discrepancies in a specific framework. It is your duty to make sure that all organizations liable to comply with this regulation satisfy the principles and include stress testing results in their decision-making. At this point we would like to urge you to consider the guideline suggested by the Basel Committee which is encouraging institutions to voluntarily disclose their stress test results more broadly in order to give to the market a better understanding of their risk profiles.

Finally, we want to conclude this section by emphasizing a comment in the document which states that "the guidance does not explicitly address the stress testing requirements imposed upon certain companies by section 165(i) of the Dodd-Frank Wall Street Reform and Consumer Protection Act. The Board, FDIC and OCC expect to implement that provision in a future rulemaking that would be

consistent with the principles in the proposed guidance". We are aware that section 165(i) of Dodd-Frank refers to banking institutions with $50 billion total consolidated assets or more, therefore the range of institutions on which this will be applied is much smaller than the range on which the principles in this document will be applied. However, it is crucial that when you complete the rulemaking for this section you take into consideration all the principles and guidelines available in this document, even if larger in size and more complex banks will most probably be expected to implement even more complicated stress testing frameworks. This will help avoid any discrepancies that may arise in institutions that will need to comply with both rules.

5. Other comments/suggestions that the "Agencies" should consider

We utterly agree with the "Agencies" that capital and liquidity stress testing should be highly integrated in order for the institution to "...remain a viable financial market participant that is able to meet its existing and prospective obligations and commitments." In general, institutions need to have a credible capital backstop so that market participants can be sure that banks will be able to raise the capital that they need under a stress environment one way or another. It is, though, very important for banking organizations to realise that not all failure events are driven by lack of capital. Operational risks or changes in the market perception can equally likely cause an institution's failure. This is something that must absolutely be included in a stress testing framework.

Ultimately, we would like to make a note on the governance section of the proposed guidance. As stated in the proposal the role of the board and senior management is very important in setting up the appropriate framework. However, what we would like to note is that they should not only take action based on the tests results but they should also actively participate in implementing the institution's stress testing framework, including scenario selection and also ensuring that there is a robust stress testing infrastructure with appropriate IT systems and resources in place. It is their duty to review and maintain these regularly in order to remain in line with the organization's risk appetite.

We would like to conclude our reply by summarizing what we think deserves more consideration. Highest in priority are the two approaches requiring banks to implement enterprise-wide and reverse stress testing frameworks, since both of these approaches will allow banks to perform a proper integrated without silos stress testing. Furthermore, we would like once more to stress the necessity of considering international regulators' principles such as the ones given by Basel and FSA in order to avoid regulatory arbitrage as much as possible and ease the implementation of a stress testing framework.

We thank the Committee for its diligent review of our concerns and comments and we would welcome queries or requests for further detail on any of the topics raised or related issues.

Sincerely,

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