OCTOBER 2013

MOODY'S ANALYTICS

RESEARCH/ ARTICLE

Moody's Analytics: Proposed Bank of England Stress-Testing Framework to Place Significant Financial Pressure on UK Banking Sector

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On 1 October 2013, the Bank of England (BoE) released its proposed stress-testing framework, which it will ultimately use as a new supervisory tool in regulating the UK banking sector. The proposed stress-testing framework will place significant financial pressure on the UK banking sector, as banks will have to invest heavily in operational infrastructure to bring them in line with stress-testing requirements. Added pressure on UK banks comes from the fact that they will have to move quickly to meet the stress-testing timeline set out in the BoE's framework (see "Stress-Testing Cycle – 2014 Exercise" exhibit in box on page 4).

We have identified three main areas of attention that will become priorities for UK banks: data, models and IT infrastructure. If UK banks fail to make timely and critical decisions about, and invest sufficiently in, the development and implementation of new databases, risk models, and IT infrastructure, they will not be compliant with the regulatory framework and will potentially expose themselves to critical weaknesses.

The financial costs to UK banks of developing and implementing the required operational infrastructure will be comparable to those incurred by US banks in their efforts to comply with the equivalent US stress-testing framework, the Comprehensive Capital Analysis and Review (CCAR). For example, in its most recently disclosed figures, one US bank with a global presence saw its workforce rise by 500 (dedicated solely to stress test submissions) and its IT expenses soar by 27% as a result of compliance[1]. The anticipated surge in demand for skilled resources in the data, modelling and IT fields will create additional challenges for banks. However, fast movers could benefit from increased investor and market confidence and could vastly improve their operations, risk management capabilities and their strategic and financial planning capabilities.

The BoE's proposed stress-testing framework is similar in many ways to the approach taken by the US with the CCAR. Stress testing in the US has facilitated a deeper understanding of financial sector health and restored market confidence.

Data

UK banks face two key data-related challenges in complying with the BoE's stress-testing framework: 1) supplementing and enhancing their existing databases with a consistent, flexible and scalable data architecture to process and store substantial internal and external data to ensure they have wider samples to analyse; and 2) ensuring that the quality of data is sufficient for stress testing.

1 Jamie Dimon, J.P. Morgan Chairman and CEO, "Letter to employees", September 17, 2013

In relation to the former, within one organisation we may find a number of databases that are predominantly heterogeneous and are not always consistent and easy to merge. Regulatory, managerial and accounting data cannot be simply put together to ensure a unique view. Even if this were possible, the final result may not be adequate to satisfy proposed stress-testing requirements, as external data is also required to support the bank's modelling efforts (e.g., macro-economic models, asset correlations and liquidity models).

Data quality is also a big challenge that affects all the actors involved in stress-testing development, including regulators. Without the highest quality data the results could be flawed or provide wrong insights.

Models

As part of the proposed BoE stress-testing framework, UK banks will have to test their current models with new assumptions, while making sure that these models encompass macro financial variables. The modelling portion of the stress-testing framework is somewhat complex in nature and will place further pressure on the banks.

In the past few years, most banks have developed their own models to support stress testing and internal capital estimates. The BoE's proposed stress-testing framework, however, is adding additional pressure on the banks to 1) develop appropriate models that are able to include macro scenarios (as provided by the BoE); and 2) translate these scenarios into projections of bank profitability and capital ratios in a coherent framework.

There are three main challenges banks will face related to their models:

» **Modelling all risks across all asset classes.** UK banks will have to develop an integrated framework for enterprise-wide stress testing that includes not only all the risks but also the impact of profits and loss and capital allocation for each scenario. This will allow banks to understand the implications and the contributions of each risk factor.

» **Testing models with new data definitions.** Banks will be obliged to review internal models to cope with the broader definition of "impairment" as proposed by the European Banking Authority in its consultation paper issued in March. As this definition is crucial for the European Central Bank's Asset Quality Review, it is very likely that BoE stress testing will be applied following the same approach.[2]

» **Making models more intelligent.** Models will have to "recognize" when they are under stress. Periods of stress will have different patterns that need to be modelled. Risk parameters (i.e., probability of default and loss given default) and model parameterisations (e.g., transition matrices and asset correlations) are strongly dependent on macroeconomic conditions. If these aspects are not accurately captured in the modelling, then the final results may be unrealistic. Banks will also be challenged to further assess the reliability of their models by exploring multiple alternative model approaches as checks on their primary stress testing models.

For example, Exhibit 1 illustrates how rating transitions exhibit different behaviours according to macroeconomic conditions.[3] This phenomenon of asymmetry in credit behaviours is particularly apparent when looking at the transition matrices of corporate ratings in two different periods, from 1983 to June 2007 (see Exhibit 1), and from June 2007 to October 2009 (see Exhibit 2).

2 EBA (03/2013) "Consultation Paper on supervisory reporting on forbearance and non-performing exposures"

3 Juan M. Licari, José Suárez-Lledó, and Barnaby Black (05/2013) "Stress Testing of Credit Migration. A Macroeconomic Approach", Moody's Analytics.

Exhibit 1: Average probabilities (1983M1-2007M1)

	Aaa	Aa	A	Baa	Ba	B	Caa-C	Def
Aaa	92.10%	7.52%	0.33%	0.00%	0.04%	0.00%	0.00%	0.00%
Aa	0.99%	90.49%	8.07%	0.37%	0.04%	0.03%	0.00%	0.02%
A	0.07%	2.76%	90.65%	5.67%	0.65%	0.15%	0.03%	0.02%
Baa	0.05%	0.24%	5.51%	87.91%	4.75%	1.14%	0.23%	0.17%
Ba	0.01%	0.07%	0.47%	6.35%	82.56%	8.60%	0.60%	1.33%
B	0.01%	0.05%	0.18%	0.52%	5.52%	82.90%	4.74%	6.08%
Caa-C	0.00%	0.02%	0.10%	1.20%	1.19%	7.12%	69.42%	20.96%

The probabilities of migration for best rating grades are structurally different.

Exhibit 2: Average probabilities (2007M6-2009M10)

	Aaa	Aa	A	Baa	Ba	B	Caa-C	Def
Aaa	78.15%	21.71%	0.04%	0.11%	0.00%	0.00%	0.00%	0.00%
Aa	0.05%	82.65%	16.03%	0.99%	0.11%	0.02%	0.07%	0.09%
A	0.00%	0.88%	89.58%	8.24%	0.44%	0.30%	0.15%	0.41%
Baa	0.01%	0.14%	2.20%	91.95%	4.40%	0.72%	0.20%	0.38%
Ba	0.00%	0.00%	0.04%	5.10%	81.25%	10.46%	1.83%	1.32%
B	0.00%	0.00%	0.07%	0.17%	3.35%	78.31%	13.55%	4.55%
Caa-C	0.00%	0.00%	0.00%	0.14%	0.23%	5.74%	71.19%	22.70%

The relevance of BoE internal models will become crucial in ensuring a deeper insight at the regulatory level. Indeed, Deputy Governor of the Bank of England Paul Tucker recently stressed this change of perspective in a speech to the HOC Treasury Committee on 8 October. He also raised the need for investing in new areas of research that are currently not properly covered (i.e., the treatment of feedback and amplification mechanisms and the incorporation of funding and liquidity vulnerabilities).

IT Infrastructure

The development by UK banks of IT infrastructure capable of bringing together data from different sources at a granular level, will be critical to the success of the BoE's proposed stress-testing framework. It will also place an added financial burden on the banks.

To be able to meet the strict stress-testing timelines laid down by the BoE, UK banks will have to invest in improving the efficiency of their processes for testing the macro economic scenarios provided by the BoE and developed internally as part of the stress-testing framework. These scenarios will have to be factored in across all the banks portfolios. Appropriate IT systems will ensure faster data production as well as ensuring data quality.

Developing an integrated IT platform that allows the overall management of the stress testing in all its components will be complex. Banks will have to consider: 1) the investigation of several scenarios, 2) the sensitivity analysis for the main risk drivers, 3) the assessment of the implications of outputs and 4) consolidated reporting. Specific regulatory requirements call for banks to adapt their planning and strategies to reflect the results obtained by stress testing.

Banks will also have to budget for the provision of sufficient resources to cope with the framework implementation. Indeed, BoE stresses that it is key for banks' senior management to devote appropriate resources to the necessary upgrade of their data infrastructure to enable them to service internal and external data needs easily.

BoE Proposed Stress-Testing Framework

It should be noted that the proposed framework, which currently contains a number of guidelines that will significantly affect the UK banking sector, will be subject to additional changes.

The proposed stress-testing framework is mainly characterised by the following features:

Scope:

» The 2014 stress-testing exercise will target the eight largest UK banks by total assets (i.e., Barclays, The Co-operative Bank, HSBC, Lloyds Banking Group, Nationwide, RBS, Santander UK and Standard Chartered Bank).

Going forward, the BoE suggests including as well:

» UK subsidiaries of foreign global systemically important banks

» Medium-sized banks

» Central counterparties may also be the subject of a separate stress-testing regime, given their importance in terms of system-wide financial stability.

Scenarios: The following are the macro economic scenarios that the BoE has envisaged:

» A set of common stress scenarios designed by the Financial Policy Committee (FPC), in consultation with the Prudential Regulation Authority (PRA) Board, and applied across all banks undertaking the stress test

» A common baseline scenario designed by the FPC and informed by, among other things, the Monetary Policy Committee's forecasts as communicated in the Bank's Inflation Report

» A set of bespoke stress scenarios designed by individual banks, and approved by the PRA Board, with a degree of severity calibrated to match at least that of the common stress scenarios designed by the FPC

Concurrency: To ensure increased oversight of implications of possible bank default at banking system level

Frequency: On an annual basis and concurrently across the banks that are in scope

Timing: In the medium term, BoE expects that the results will be published six/seven months after the date of the balance sheet information used as inputs for the exercises.

Public Disclosure: A key principle underpinning the proposed stress-testing framework is that the outcome of, and analysis associated with, the stress-testing exercise should be made public. Although the way in which this will be done has not been set.

Stress-Testing Cycle - 2014 Exercise

Key Milestones	Dec '13	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. PRA publishes templates and information requests	Dec 31st												
2. FPC/PRA release common scenarios				Mar 31st									
3. Banks submit detailed portfolio data to PRA				Mar 12th									
4. Banks finalize bespoke scenarios					April								
5. Banks assess impact of scenarios on their portfolios, capital, profitability and trasmission to PRA					Q2 2014								
6. FPC/ PRA conduct own analysis using regulator's models and interactions with banks					Q2 - Q3 2014								
7. FPC / PRA Board review results and agree policy actions											Q4 2014		
8. FPC/ PRA publish results													End Q4

The new UK stress testing regulatory requirements promulgated by the BoE are an important and major step in improving market transparency and confidence in the UK banking sector. As banks further improve their operations and risk management capabilities in response to the new requirements, new capabilities will emerge that will greatly enhance the capacity for the UK banks to better respond to difficult market conditions. Much work is in store for the UK banking industry to meet the high bar set by the BoE. In particular, improvements in data management, data consumption, model development and IT infrastructure will be important priorities requiring substantial attention and investment for the UK banks.

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