



ASIA PACIFIC FINANCE AND RISK SERIES

HOW WELL DO YOU KNOW YOUR BANKS?

THE CASE FOR SUPERVISORY STRESS
TESTING DEVELOPMENT IN ASIA

1. THE EMERGENCE OF SUPERVISORY STRESS TESTING

Over the last 20 years, banking regulators have experimented with increasingly sophisticated risk measurement, including economic capital and formulaic approaches to calculating Risk-Weighted Assets (RWAs). However, the industry is now looking for a new prudential paradigm that deals with weaknesses in these techniques which were exposed by the global financial crisis.

Led by the United States and Europe, this search has been characterised by a focus on financial stability, including a greater emphasis on macro-prudential regulation and its link to supervision, and enhancements to micro-prudential tools.

Against this backdrop, supervisory stress testing has emerged as a critical instrument of analysis. In this paper, we define supervisory stress testing as a system-wide stress testing exercise centrally coordinated by the prudential regulator, with the involvement of banks. By linking capital adequacy to specific scenarios, stress tests have, in some ways, superseded regulatory minimum capital buffers, which some have criticised as opaque and model-dependent. Regulators have also used stress tests as a transparent tool with which

“ This exercise...bolstered transparency in the banking sector and exposed the areas in the banks and the system that need improvement. ”

– Danièle Nouy, Chair of the European Central Bank (ECB) Supervisory Board, 2014

“ The supervisory stress tests developed by the Federal Reserve over the past five years provide a much better risk-sensitive basis [than the IRB approach] for setting minimum capital requirements. ”

– Daniel Tarullo, Member of the Board of Governors of the Federal Reserve, 2014

to communicate credibly with worried markets, and as a crude but increasingly effective way to understand the link between macro-economic movements and the balance sheet sensitivities of individual banks.

Although stress testing is part of the requirements of the second pillar of Basel II, the current approach to stress testing emerged as a response to specific financial crises. The 2009 Supervisory Capital Assessment Program (SCAP) in the United States, and the European stress test, conducted by the Committee of European Banking Supervisors (CEBS), aimed to provide assurance to investors. They were designed to estimate the impact of the crisis, and the amount of capital required to fill the gap in bank balance sheets. Subsequently, Europe and the United States have followed two distinct paths for supervisory stress testing.

As Europe struggled with successive crises, its supervisory stress testing scenarios were criticised as too optimistic. Banks, such as Dexia and Bankia, passed the 2011 CEBS stress test, but ultimately needed to be rescued. Consequently, supervisory stress testing in Europe became increasingly focused on accurately assessing asset quality. The 2014 European Central Bank (ECB) Comprehensive Assessment included an Asset Quality Review (AQR), in addition to the stress test, to ensure balance sheets were correctly valued. By scrutinising their asset valuations, a key input to the stress test, the AQR showed that banks had the capital to withstand a crisis, and served as a credible health check.

In the United States, stress testing evolved from a tool used in crisis response into an ongoing supervisory tool. Supervisory stress testing is now timetabled in bank calendars. The motivations of the Federal Reserve's annual Comprehensive Capital Analysis and Review (CCAR) go beyond estimating the impact of a crisis. By testing banks' risk identification, measurement, and management capabilities, CCAR pushes them to improve their risk management and capital planning, thus setting a higher bar for the most complex banks.

Oliver Wyman has played a major role in both of these developments, working with supervisors and banks to design, build and execute stress tests. It is our contention that there is a strong case for Asian regulators to embrace stress testing, and act accordingly, before a potential economic downturn.

2. THE CASE FOR SUPERVISORY STRESS TESTING IN ASIA

In comparison to United States and Europe, Asia suffered much less from the global financial crisis. Asian regulators have not therefore had to develop as robust a stress testing toolkit as their Western peers. Nevertheless, they have adopted a combination of stress tests conducted by regulators, and those carried out by banks under a regulatory mandate. For example, the Monetary Authority of Singapore (MAS) periodically asks banks to conduct stress tests, using house price scenarios it has developed. Similarly, the Bank of Japan and Reserve Bank of India conduct outside-in stress tests for semi-annual financial system stability assessments.

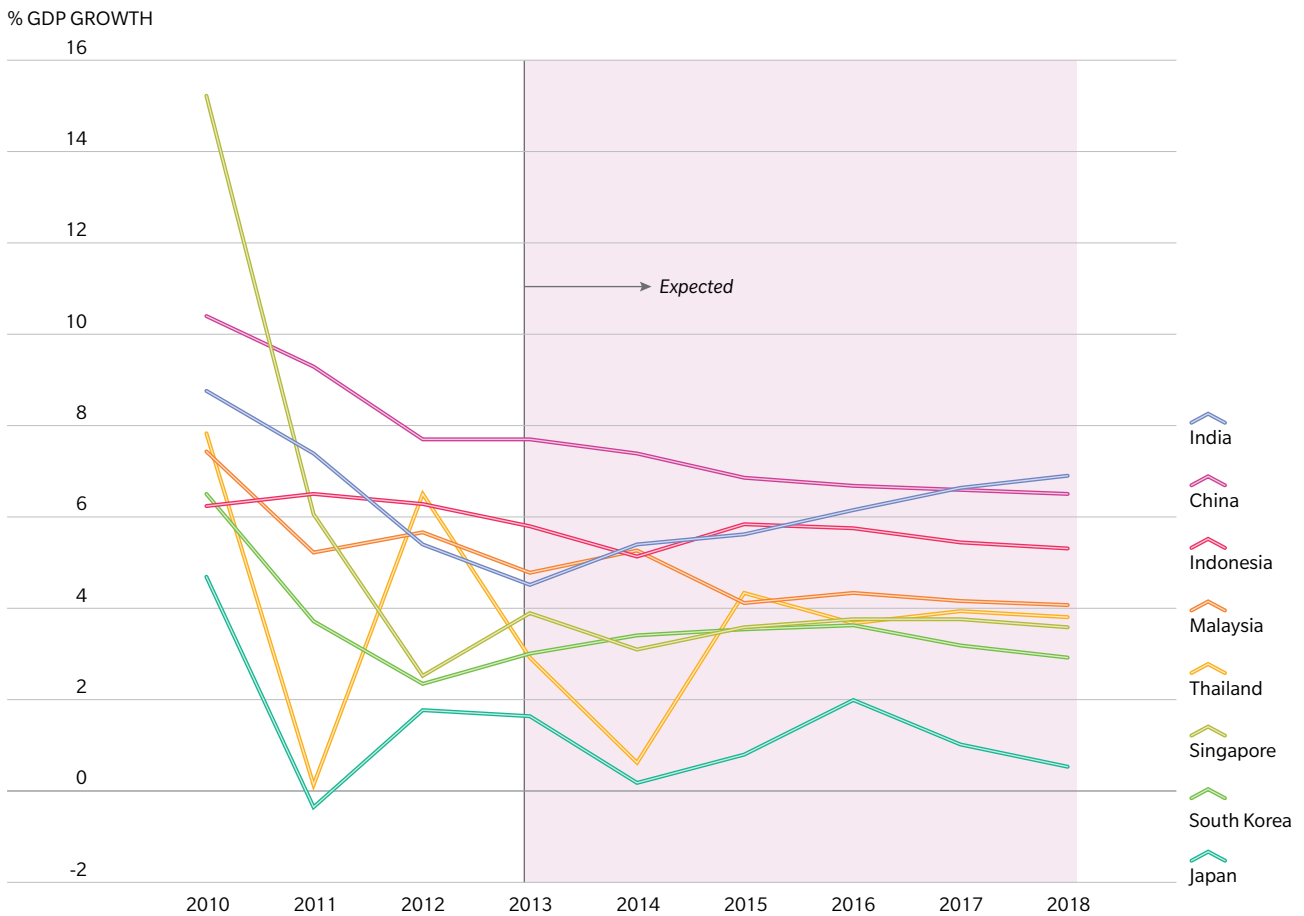
There are five key differences between Asian supervisory stress testing regimes and those employed in the United States and Europe. These are outlined in Exhibit 1.

Exhibit 1: Supervisory stress testing practices by geography

	EVOLVING	DEVELOPING	DEVELOPED	ADVANCED
Structure <i>Degree to which stress tests are coordinated by regulator</i>	<ul style="list-style-type: none"> Some stress testing conducted by individual banks, usually via ICAAP submissions Separate top-down stress test may be conducted by regulator for systemic stability purposes 	<ul style="list-style-type: none"> Regular system-wide stress test coordinated by regulator, involving most or all banking institutions 		<ul style="list-style-type: none"> Multiple annual system-wide stress tests coordinated by regulator
Scenarios <i>Source and comprehensiveness of stress scenarios</i>	<ul style="list-style-type: none"> Scenario primarily defined by individual banks Supervisor-prescribed scenarios limited to specific risk factors 	<ul style="list-style-type: none"> Regulator provides scenario, but scenario may be limited to a few risk factors 	<ul style="list-style-type: none"> Regulator provides broad macroeconomic parameters, and potentially additional benchmarks 	<ul style="list-style-type: none"> Regulator provides full set of economic scenarios, and event/ portfolio-specific tests Banks also provide scenarios
Governance <i>Oversight of stress test process by board and senior management</i>	<ul style="list-style-type: none"> High-level review of scenarios and results by board and senior management Use test may not be rigorously enforced 		<ul style="list-style-type: none"> Some focus on how bank reviews, challenges and uses results 	<ul style="list-style-type: none"> In-depth review and challenge of methodology and risk drivers, not just results Embedding in planning processes
Supervisory assessment <i>Oversight of the stress test process by the regulator</i>	<ul style="list-style-type: none"> Regulatory review of end results used to inform bank supervision 		<ul style="list-style-type: none"> Some review of analytics and process Results tested against regulators' top-down model outputs, benchmarks, or cross calibration 	<ul style="list-style-type: none"> In-depth qualitative review of analytics and process Results tested against regulators' parallel granular model outputs Results linked to approval of strategic capital actions

Source: Oliver Wyman analysis

Exhibit 2: GDP growth in Asia by country, 2010-2018E

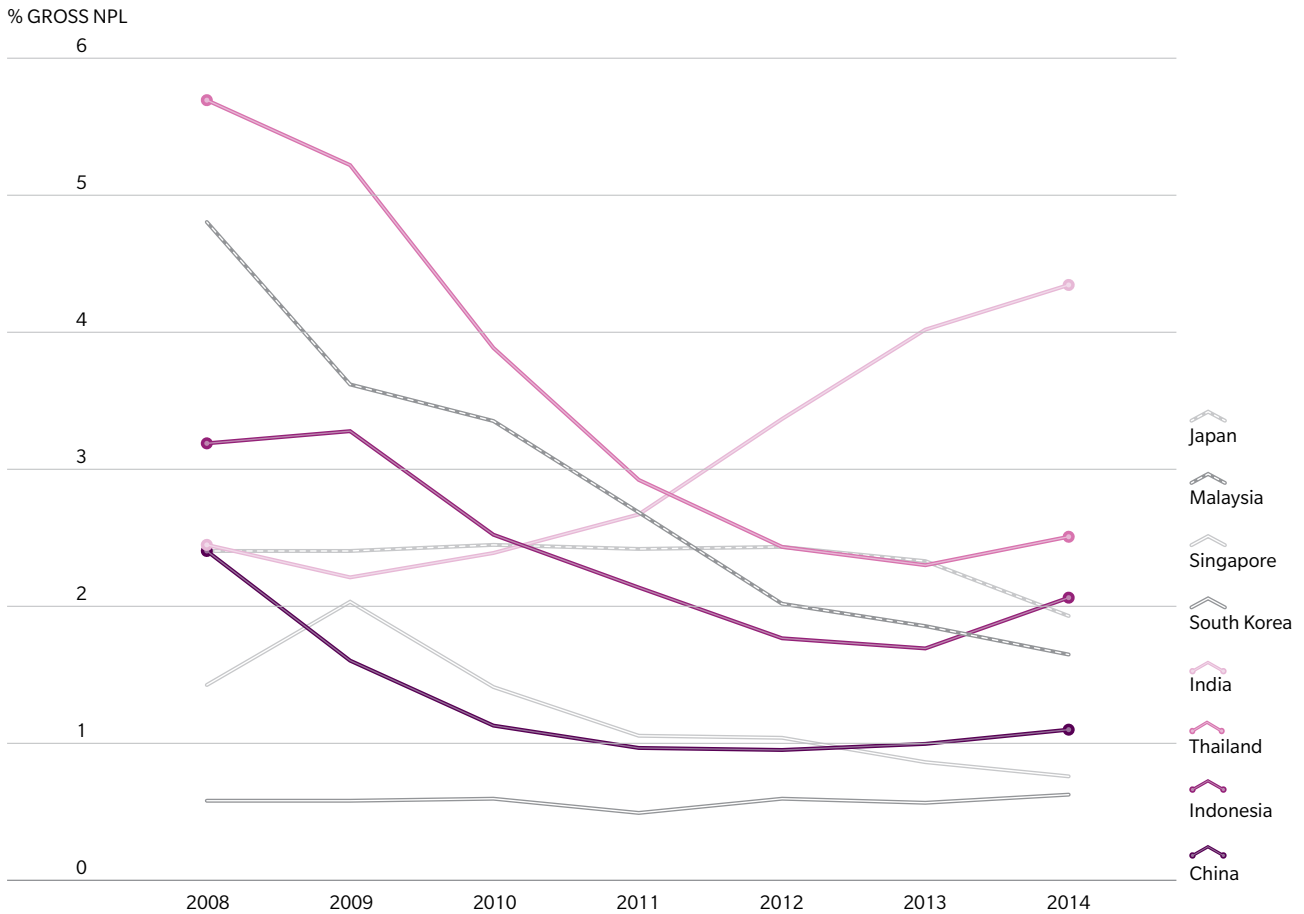


Source: National governments and central banks

As Asia has enjoyed significant growth and credit expansion in the aftermath of the financial crisis, this “light-touch” approach to stress testing has probably been sufficient. However, the past is not always a guide to the future. Asia’s growth in credit and asset prices has been fueled by hot money flows, and long-term low rates in developed economies. As in any boom, the tide of easy money may conceal risky investments, poor lending decisions, and other hidden risks, which will only become apparent in the next downturn.

Asian GDP growth has already started to slow down, and is forecast to continue to do so, as shown in Exhibit 2. Regulators and banks should ask themselves if they are ready for the turn of the credit cycle. In some parts of Asia, such as China, Indonesia, Thailand and India, bank gross Non-Performing Loans (NPLs) have already begun to rise. Exhibit 3 illustrates these developments.

Exhibit 3: Rising NPLs in Asian banks



Source: 2015 Global Financial Stability Report, International Monetary Fund

There is also a shortage of accurate information on credit portfolio quality in many markets, making concentration risks harder to identify and understand; this issue should raise alarm signals at board-level. Supervisory stress testing can expose balance sheet risks and help banks prepare for the next downturn, but they can also help pinpoint areas where banks' internal risk and data management requires improvement.

Global macroeconomic conditions have also become more volatile, and are increasingly shaped by substantial policy shifts responding to specific local circumstances. In the last few years, banks have had to respond to the normalisation of US interest rates, the start of quantitative easing programs in Europe and Japan, and the collapse in oil prices. Regulatory capital measures, such as countercyclical buffers, were designed to adjust for changes in the economic cycle, not to anticipate the impact of sudden macroeconomic shifts. Supervisory stress testing is the best approach to ensure banks are sufficiently prepared and capitalised to manage macroeconomic risk.

Exhibit 4: Impact of significant macroeconomic changes on banks

DATE	MACROECONOMIC SHIFT	IMPACT
2014	Price of iron ore declines 50% in one year	Earnings impact on Australian miners
Oct 2014/Nov 2014	Oil prices drop by 50% in five months	Significant earnings impact on energy sector
31 Oct 2014	Japan increases quantitative easing program to fight deflation	Japanese Yen falls to lowest level in seven years
15 Jan 2015	Swiss National Bank abruptly scraps currency cap, immediately leading the Swiss Franc to appreciate 30% against the Euro	Losses for investment funds and currency brokers, including insolvency (e.g. Alpari UK)
28 Jan 2015	Singapore changes exchange rate policy outside of regular policy meeting	Singapore dollar falls to lowest level in four years
11 Aug 2015	China devalues RMB by 2%, the biggest one-day move since 1993	Shock to commodity prices and energy sector
Dec 2014/Jan 2015	US dollar rallies approximately 10% against emerging market currencies in six months	Impact on cost of US dollar borrowing for Asian corporates
2015-2020	IMF and World Bank estimate China GDP growth to decline to an average of approximately 6.6% to 7%	Decline in exports from South East Asian economies

Source: Oliver Wyman analysis

Now is the time, while conditions are still relatively benign, to introduce such capabilities in Asia's regulators, and not – as in Europe and the United States – when great harm has already been done. Moreover, given the current uncertainty and disquiet from banks regarding Basel III and the potential new Standardised Approach, stress testing offers a consistent way of understanding bank's balance sheets that remains unaffected by global regulations.

Naturally, different regulators will not have identical supervisory objectives, leading to some disparity in the budgets that can be deployed to improve stress testing. Importantly, making the stress test more rigorous does not necessarily mean that budget or team size need to be significantly increased. Supervisory stress testing can vary according to the circumstances. For example, the Australian Prudential Regulation Authority (APRA) adopts a less resource-intensive approach which, nevertheless, preserves some sophisticated elements from the United States and Europe, including benchmarking of bank stress test parameters.

3. IMPROVING SUPERVISORY STRESS TESTING IN ASIA

Asian regulators should advance in three ways. First, regulators should make their stress tests more rigorous, by improving the way stress scenarios are defined and applied. Second, regulators should help banks to embed stress testing in planning and performance management processes. Third, once these foundations are set, regulators should make more use of stress testing data in prudential and policy-making processes.

3.1. MAKING THE STRESS TEST MORE RIGOROUS

The experience of regulators in Europe and the United States has taught us that a credible supervisory stress test must truly probe banks' vulnerabilities. A severe macroeconomic scenario is necessary, but not sufficient, to make a stress test credible. A deeper review of banks' models is also needed to ensure balance sheets are genuinely stressed in a risk-sensitive way. Whilst this has to be carried out within the Asian context, there are areas where Asian regulators can learn from Western advances.

Developing stress scenarios

Asian regulators should consider using bank-developed scenarios for their stress test, along with their own scenarios. The Federal Reserve includes banks' bottom-up scenarios in CCAR, and the ECB has the discretion to do so as well. Asking banks to develop their own scenarios encourages more proactive thinking about their own vulnerabilities, reducing reliance on regulatory scenarios. It also allows the regulator to compare the risks identified by each bank with those it has identified as part of regulatory surveillance.

Banks' scenarios should be tailored to their vulnerabilities. The Federal Reserve required banks' scenarios to be of "comparable severity" to the regulatory stress scenario, without laying down any specifics. Banks in the United States responded by increasing stress severity for specific portfolios, or adding regional variables or event overlays to the regulatory scenario. Likewise, Asian stress scenarios should be tailored to Asian banks' macroeconomic vulnerabilities, with greater focus on factors such as commodity prices, real estate prices, downturn in China, US dollar liquidity and the impact of foreign exchange rate shifts on borrowers.

Applying the stress scenario to bank portfolios

Asian banks may face greater methodological challenges than their Western counterparts. Recent loss data may not capture significant stress, making it difficult to use it in modeling bank portfolios. As well as mandating improvements, regulators should help banks to refine their approaches. For example, regulators can construct benchmarks by analyzing historical stresses in other regions. To help banks to model asset classes with low default experience, regulators can aggregate data to construct a system-wide benchmark.

To help banks overcome methodological challenges, regulators should also provide more feedback. The experience of the United States suggests several rounds of model design feedback can help banks to develop more rigorous modeling approaches. This is especially the case for the modeling of balance sheet volume and income, which often receives less attention than loss forecasting. The experience of Western regulators also suggests that an outside-in model can help to achieve a clear understanding of stress test results. The ECB applied a top-down model and benchmarked bank parameters as part of the 2014 Comprehensive Assessment. This could potentially require some enhancement of expertise, but this should be a worthwhile investment. While the United States CCAR process is even more rigorous, with more than a hundred supervisors running outside-in models using granular data from banks, this may be excessive in the Asian context. Regulators should choose the level of assessment that meets their objectives.

Asian regulators may also be concerned about aggressive asset valuations, given that loss recognition may be delayed in a period of credit growth. If this is indeed an issue, regulators should combine a stress test with an asset quality review. The ECB applied this approach in the 2014 Comprehensive Assessment. An objective credit audit can reveal weaknesses in provisioning and valuation, as well as the extent of forbearance in the portfolio. Remediating these issues is an important part of starting a stress test at the right point, and reaching a credible result.

3.2. EMBEDDING THE STRESS TEST

Stress tests are more valuable when they are not simply “pass/fail” exercises, but also used by management to influence strategy. Under Basel II Pillar 2 standards, banks must link planning, risk appetite and performance management. But they have sometimes struggled to do so. For example, the risk appetite statement may not be cascaded to business lines, or plans not appropriately stress tested against potential future breaches of risk appetite.

Stress testing can build this link by using the scenario as a tangible expression of risk appetite, supported by minimum and target capital and liquidity levels. By forecasting balance sheet and earnings under stress, management can see the impact of alternative scenarios on strategic and investment options, in this way aiding decision-making. Stress testing should hence become a core part of the annual planning process, and help banks to set limits and plan contingencies.

Banks in Europe and the United States have made progress in embedding stress-testing in strategic planning, although they still have some way to go before truly embedding stress testing approaches in business decision-making. CCAR embeds the stress test in a pre-emptive capital management framework that considers both forecasted stress capital ratios and current capital ratios. European banks have also started to use top-down scenario forecasts and “what-if” analyses in their annual planning processes. Even in the absence of a crisis, Asian regulators should use supervisory stress testing to help banks enhance planning and strategic decision-making, if only to instill the necessary discipline to avoid nasty surprises or hurried, uninformed reactions should a crisis emerge.

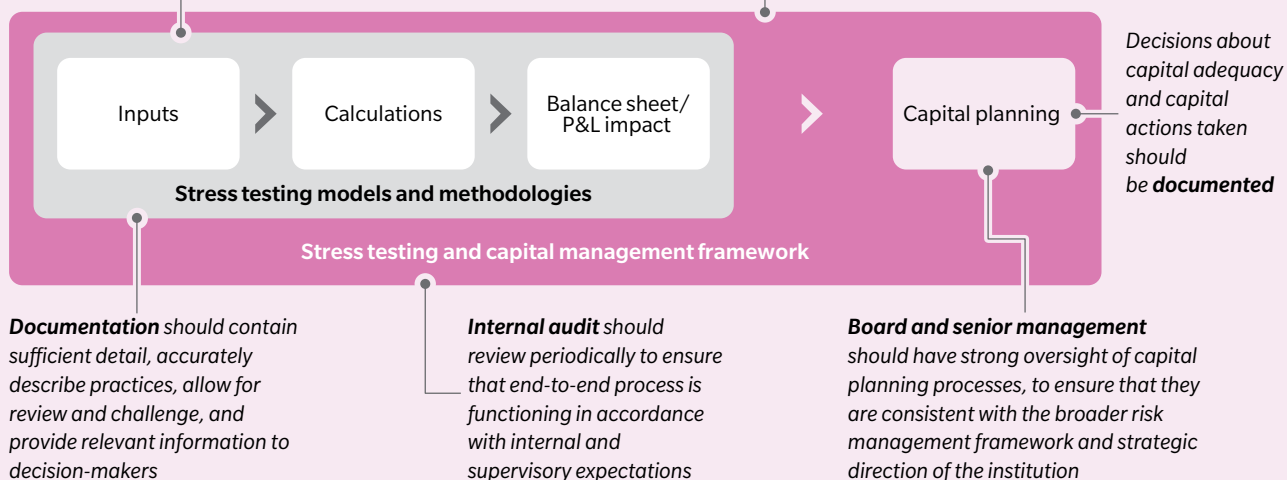
Leading regulators have broadened the focus of stress testing from the analytics, to the drivers of risk for banks’ businesses and strategy

A successful stress test includes a large number of distinct processes. Generally, banks have developed loss forecasting methodology ahead of other stress test processes. Increasingly, however, leading regulators have used stress tests to prompt more thoughtful consideration of strategic and macroeconomic risks. In doing so, they have placed more onerous requirements on their banks in several areas:

Scenario development process ensures that the scenario provided by the regulator is translated into something with real meaning for the business; in the case of less simple scenarios (e.g. an oil price shock), or financial markets businesses, this enrichment is of utmost importance

Specific **controls** should be in place to

- Ensure robustness of Management Information Systems (MIS)
- Provide for reconciliation and data integrity processes
- Address presentation of enterprise-wide results
- Ensure reports to senior management and board contain appropriate level of detail and are accurate and timely



Source: Capital Planning at Large Bank Holding Companies: Supervisory Expectations and Range of Current Practices, US Federal Reserve, Aug 2013

3.3. MAKING USE OF STRESS TEST INFORMATION

Once these foundations have been built, regulators should use stress test data in policy-making. Stress tests produce a wealth of data on how banks respond to changes in macroeconomic conditions. If potential policy changes are embedded in scenarios, stress tests can provide insight into their effects.

Monetary policy

Much of the burden of managing slowing growth and rising debt in Europe and the United States has fallen, in recent years, on central banks. By aligning banking and monetary authorities, leading regulators and central banks have started to use stress testing to enhance their ability to manage this responsibility. For example, in CCAR 2014, the rising long-term interest rate scenario was widely seen as a test by the Federal Reserve of how the ending of quantitative easing may affect banks. Likewise, Asian authorities can use the stress testing of bank's balance sheets to estimate the effectiveness of rate setting or monetary stimulus policies.

Macroprudential policy

Asian regulators are already proactively using macroprudential tools to manage systemic risks. For example, Loan-To-Value (LTV) ratio caps have been used by the MAS and Hong Kong Monetary Authority (HKMA), among other regulators, to manage rising real estate leverage. Stress testing can become a useful part of this toolkit, aiding adjustments to LTV caps, Debt Servicing Ratio (DSR) floors, and similar interventions. In addition, stress scenarios developed by banks can be aggregated to improve understanding of emerging systemic risks, and the main variables identified in stress testing can be monitored as early warning signals of potential downturns.

Microprudential supervision

Regulators can also use stress tests to inform supervisory inspections. Poor performance should be closely followed by remedial actions. For example, the Federal Reserve has used CCAR results to prioritise resources and discuss portfolios of concern with banks. Similarly, the ECB has used the results of the AQR, in the 2014 Comprehensive Assessment, to scrutinise specific portfolios.

Beyond the results, as mentioned earlier, rigorous requirements can also shine a light on risk model and data quality weaknesses. For example, at some banks in the United States, the need to calibrate conditional risk-rating migrations to macro risk drivers has highlighted gaps in rating processes. Banks in some Asian jurisdictions suffer from relatively acute credit risk data quality issues, and the stress tests would be ideal tools for pinpointing which areas of potential concentration risk require immediate attention in this regard.

4. NEXT STEPS FOR ASIAN REGULATORS

Asian banks weathered the global financial crisis better than their Western peers. They therefore have a unique opportunity to learn the lessons from Europe and the United States. Asian regulators should take action now, to overhaul their supervisory stress testing regimes. We see five next steps for Asian regulators, each of which poses several questions:

1. Review potential applications of stress testing

- How do we compare with the leading regulators?
- How can we use enhanced stress testing to support our overall objectives?
- How do we ensure stress testing leads to tangible outcomes, and is more than an academic exercise?

2. Develop a holistic supervisory stress testing framework

- How do we develop a framework aligned to prudential objectives?
- Should an industry-wide, regulator-led stress test be run? How often?
- Which banks should be required to participate?
- What is the right timeline for this exercise?
- Which scenarios should we provide to the banks?
- Should additional scenarios be tested by the banks?
- What information should be released to the public?

3. Define expectations for banks

- How should banks be required to develop their own stress scenarios?
- What depth of analysis should be required from banks?
- What level of documentation should be required from banks?
- What should be the level of involvement of senior management and boards of directors in signing off results and capital plans?

4. Enhance supervisors' methodological expertise

- How much scrutiny should we place on banks' results?
- How do we plan to benchmark bank results? How do we know the results are sufficiently stringent?
- Should top-down models be run by a supervisory team?
- What are the leading industry practices in stress test model design?
- How do leading regulators collect and process stress testing submissions from banks comprehensively, yet efficiently?

5. Enhance supervisors' process expertise

- How do we ensure internal consistency between the various parts of a bank's analytical forecast (e.g. balance sheet and profit and loss statement)?
- What are the leading industry practices in process and governance?
- What are the leading industry practices in embedding stress testing in strategic planning and business decision-making?

Asian supervisors should use stress testing, the key prudential tool created to combat the last crisis, to strengthen their financial systems. If they accomplish this successfully, they will have seized the opportunity to prevent the next crisis.

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialised expertise in strategy, operations, risk management, and organisation transformation.

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