Executive Summary

Relevant risk management information is critical to making informed business plans and strategic decisions. So when bank management takes a “check the box” approach to stress testing that focuses exclusively on compliance, they miss out on important opportunities to better understand the strengths and weaknesses of their business. But the usefulness of business-specific stress testing depends heavily on how bank staff identify key risks and scenarios, how stakeholders interact, and how they use risk insights to affect and make changes to their firm. In this second paper in a two-part series on stress testing, learn best practices gleaned from banks that are successfully using bank-specific stress tests to run their business smarter, safer and more profitably.

The Current State of Stress Testing

Across the globe, regulators have been rolling out stress test programs to understand how well banks can withstand adverse economic scenarios. Countries vary primarily in terms of the maturity of their implementations. For international banks, they are setting up and executing multiple stress test projects mandated by the US Federal Reserve, the European Banking Authority and the Bank of England. The quality of these stress tests is measured in part by their ability to provide desired transparency around specific post-stress capital ratios.\(^1\) For example, the purpose of DFAST in the US is to assess quantitatively how bank capital levels would fare in various stressful situations.\(^2\)

Over the years, most banks have hired highly skilled analysts, automated complex processes and deployed new software to run these government-mandated, systemic-risk scenarios against their book of business and balance sheet. Because their focus is on systemic risk, these tests provide little insight into the risks facing individual banks. For example, systemic stress tests can’t help bank managers and executives discern when they are overstepping risk limits when issuing mortgages to new customers.

So it’s no surprise that in a 2014 SAS survey of 100 senior risk and finance executives, results showed that 41 percent of banks indicated that stress testing is not yet influencing business decisions.\(^3\) However, the research did indicate that banks are looking to take steps to make stress testing an integrated part of the business (as opposed to an annual regulatory exercise) to drive better decision making. This is exactly what’s needed to successfully walk the tightrope between opportunity and risk.

Survey Question: In the past two years, which of the following business decisions have been directly influenced as a result of your regulatory stress testing, and which do you expect to be influenced in two years’ time? Please select all that apply.

Figure 1: Results from the SAS survey of 100 senior risk and finance executives

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\(^1\) The post-stress capital ratios under examination include: 1) tier 1 common ratio: the ratio of the common equity component of tier 1 capital to risk-weighted assets; 2) tier 1 capital ratio: the ratio of tier 1 capital risk-weighted assets; 3) the total risk-based capital ratio: the ratio of total regulatory capital to risk-weighted assets; and 4) the tier 1 leverage ratio: the ratio of tier 1 capital to average assets. The results include projections of net income before taxes, including revenues, provisions and losses (e.g., loan losses).

\(^2\) The Dodd-Frank Wall Street Reform and Consumer Protection Act was designed to control risk in key areas of the US financial system. Regulators use it to compare one bank to another and see how the entire financial system would handle certain stress scenarios. This legislation has played a critical role in driving US banks to invest in stress testing resources.

\(^3\) sas.com/content/dam/SAS/en_us/doc/research2/longitude-stressed-out-107375.pdf
The fact is that operational, legal, compliance and other risks have increased over the years, necessitating the need to go beyond check-the-box, compliance-driven stress testing and VaR models. As explored in this paper, they need business-specific stress tests that combine traditional VaR scenarios with stress tests - complete with agreed-upon risk limits - based on probabilities that business managers deem realistic for their business. Equally important, they need a way to have an integrated, enterprise view of risk estimates and insights. Armed with these insights, they can walk the opportunity-risk tightrope faster and safer while achieving better business outcomes.

Best Practices of Business-Specific Stress Testing

The good news is that banks can use technology to overcome many of the barriers to business-specific stress testing and gain an integrated view of risk (and risk types) across all business units. An effective approach enables banks to stress-test all the components of risk on both an aggregated and individual basis, including market, credit, ALM, operational, business, strategic and reputational risk. Then, integrated stress test results are incorporated into day-to-day capital adequacy considerations. An integrated view of test results enables practitioners to analyze the warning signals for each risk; assess the length, speed and magnitude of the risk for each business unit; and take timely, corrective action.

What a Successful Stress Test Approach Looks Like

A bank’s ability to conduct integrated, business-specific and repeatable stress tests is dependent on its ability to acquire data from many systems needed to build and govern models, develop and maintain scenarios, execute analytics in a timely manner, and bring results together for a holistic, enterprise view of risk. The following steps, summarized in Figure 2, explain how other banks are doing this successfully.

1. Know the Organization’s Risk Limits
Know the organization’s risk limits – the maximum amount of risk the bank is willing to accept across key areas of the business. These risk limits must have teeth – and be upheld all the way to the board level.

2. Understand the Business Rationale and Data Needed for Each Stress Test
Understand the business rationale for stress tests and how and where to get the data. This requires having a committee with people who know what other business-specific stress tests are wanted and needed, where relevant data is located, etc. They can determine the parameters and assumptions of models, the data needed to run it, the limitations of models, and ensure that results are viewed in context. Business users must be able to manage all the necessary information about data, including business concepts and how they relate to each other, as well as where and how they are represented in the data.

3. Bring Together and Manage the Right Data
Use tools to aggregate the necessary data from the fragmented data sources across the organization and bring it into an automated test environment. The goal is to connect operational systems, link data across different analytical systems to create a single version that’s available enterprisewide, and have confidence that the data is correct, current and complete. This allows decision makers to aggregate data, run analyses once and use the results in various applications.

Without the right tools, data aggregation and integration aren’t easy. In fact, data-related issues are among the biggest challenges to comprehensive, enterprise-wide stress tests. Data provisioning, data quality, data consolidation and data aggregation continue to pose numerous challenges for most institutions. In addition, tracing and documenting data transformations is often time consuming, inefficient and incomplete. That’s why SAS® software offers comprehensive data management that supports data quality, data lineage and metadata documentation throughout the entire stress testing life cycle.
Using Software to Streamline and Accelerate the Process

Banks seeking to automate business-focused stress testing can jump-start the process by leveraging their existing investments in risk analyst teams, re-engineered processes and risk systems for Basel II and Basel III compliance. These investments can be complemented with other software that supports data management and analytics, as needed.

For example, software can be combined to orchestrate complex sets of data, models (in a library), scenarios and information flows to enable stress testing and reporting. Using the right software, banks can also bring together finance and risk data into a structure that supports workflow processes for capital planning and analysis, testing of economic scenarios for what-if analysis, and more.

From a business architecture point of view, software can act as a centralized, fully governed orchestration hub that interacts with satellite systems. Many solutions are designed to incorporate feeds and routines from third-party systems, tools and platforms, including business process support, to help banks:

• **Improve capital planning.** Enable more efficient capital planning that takes into account projected balance sheets, income statements and risk-weighted assets of various legal entities and business units involved in your strategic planning activities.

• **Align strategies and goals across functions.** Develop strategic plans at the appropriate hierarchy across risk, capital, business and regulatory compliance functions at a corporate or business-unit level. Then, plans are distributed as needed for execution.

• **Ensure consistency, transparency and auditability.** Aggregate and reconcile risk and finance data across all lines of business. Calculate economic capital for all portfolios, and update regulatory reports dynamically to ensure ongoing accuracy and compliance.

• **Integrate funding strategy into capital reporting.** Quickly consolidate data for iterative scenario analysis and stress testing, and automatically generate pro forma financial statements.

• **Boost staff efficiency.** Quickly produce regulatory reports with a preconfigured capital planning framework that includes predefined dimensions, form sets, formulas and templates.

4. Build an Automated Stress Test Environment

Build an automated stress test environment that both streamlines compliance activities and supports business-specific stress testing for better business management. For example, you should be able to stress-test capital levels when changes are performed to the IRB system (e.g., when a credit risk model is implemented) to assess the impact of regulatory changes on the business. Central to automation is the stress test workflow management component that enables a firm to define custom workflows; initiate, monitor and orchestrate discrete workflows with controls and approvals; and administer the overall stress testing workflow. This element of an effective stress testing environment also acts as a documentation hub for the workflow(s). (This environment is described in the SAS Point of View paper available at sas.com/en_us/whitepapers/comprehensive-stress-testing-106958.html.)

5. Create a Dashboard to Aggregate Results

Aggregate all of the risk data gathered so decision makers can see where risk thresholds are being crossed by line of business and risk type – as well as the total risk the bank faces. Figure 3 shows a dashboard that presents the opportunity to drill into stress test results for each subsidiary for each level, including the bank’s exposure and if it’s holding enough capital.

6. Make Business Adjustments

And finally, facilitate bank executives working together to make business adjustments so that risk falls below agreed-upon risk limits. This can mean allowing business areas to share risk. For example, if one line of business is well below its risk limit, its unused risk can be allocated to another line of business that is over its risk limit.

![Figure 3: An example of a dashboard summarizing risk insights](image-url)
• **Data management.** A set of tools enables fully auditable data capture, exploration, validation and quality control monitoring. There’s also a risk and stress testing data model to consistently store portfolio, market and model data.

• **Model development.** A single module lets banks develop, test and store all stress testing models.

• **Model workflow and governance.** A management environment is used across all models to monitor the entire stress testing process, including governance.

• **Model execution.** A broad spectrum of models may be implemented and executed.

• **Scenario management.** A tool is provided to manage the scenario library. Banks can use it to build, analyze and manage both regulatory and institution-defined scenarios.

• **Risk data aggregation and capital planning.** A fully auditable consolidation engine helps banks prepare stressed income statements, balance sheets and capital measures.

• **Visualization.** An in-memory reporting and visualization component lets banks explore large portfolios; drill down to granular results; and create interactive, highly visual management dashboards.

**Key Takeaways**

Stress testing for compliance is important and should be completed as efficiently as possible – but it’s not sufficient for true risk management. More than ever, banks need business-specific stress tests to make informed business decisions – and successfully walk the tightrope between opportunity and risk. This means extending stress testing processes and taking an enterprise approach to risk management.

SAS can help. AITE, an independent research and advisory firm known for its finance and risk systems expertise, recently rated SAS a stress testing leader and particularly recommended SAS for “banks that want to introduce as much automation to the process as possible and aggressively seek analytic benefits that go well beyond compliance.”

With SAS, banks automate data management, repetitive tasks and compliance work to free highly skilled team members to focus on the creative and engaging work of strategy, planning and execution.

Adoption of this approach will continue as the banking industry continues to increase focus on risk-adjusted performance and risk-influenced decision making.

**Learn More**

To learn more, please refer to Part 1 of this series on stress testing, which discusses best practices for automating business-specific stress testing.

SAS and Longitude Research conducted an in-depth survey of more than 100 senior banking officials to assess how the rise of stress testing is affecting their organizations – reviewing where investment is being focused, what the key priorities are, and how this is changing the oversight and management of these institutions. Read Stressed Out? How US and European banks are responding to regulatory stress tests.