

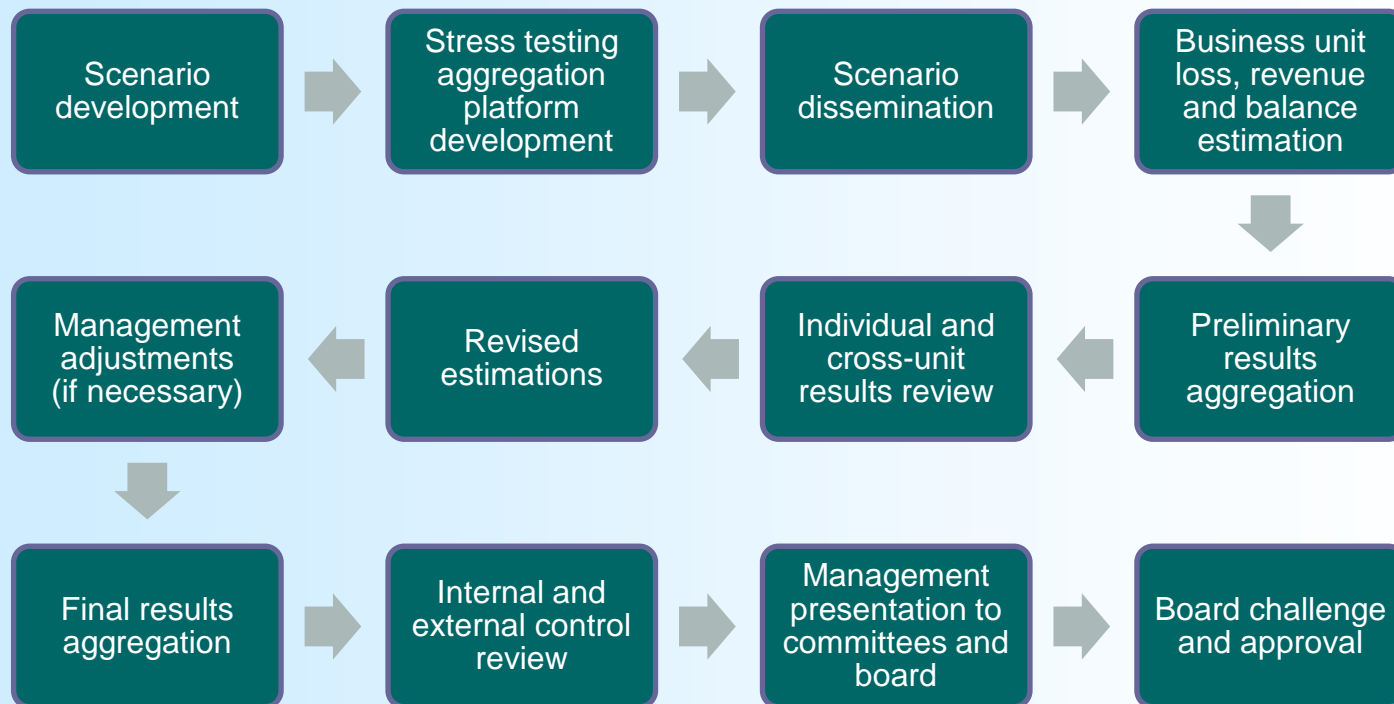
Capital Stress Testing

Results Aggregation and
Consolidated Financial Presentation





Stress Testing Process





Session Objectives

1. Overview of the aggregation and presentation processes
2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements
3. Effective challenge of the estimation and aggregation processes
4. Data management and controls around the aggregation and presentation processes
5. Presentation of results and management reporting conventions

Objective 1: Aggregation & Presentation



- 1. Overview of the aggregation and presentation processes**
2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements
3. Effective challenge of the estimation and aggregation processes
4. Data management and controls around the aggregation and presentation processes
5. Presentation of results and management reporting conventions

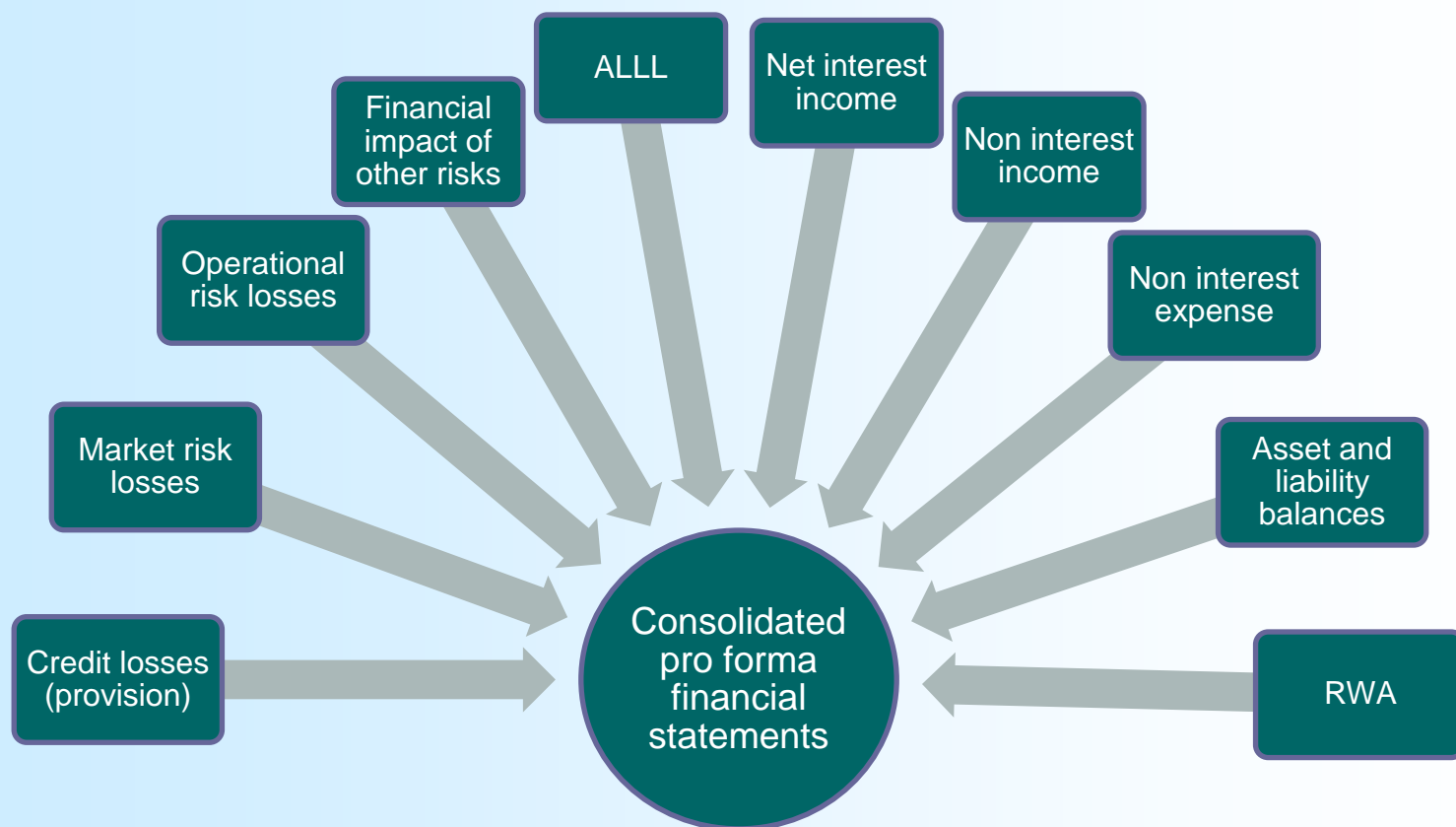


Aggregation & Presentation

- BHCs should have an aggregation process that:
 - Is well-established and consistently executed
 - Combines loss, revenue, balance sheet, and RWA projections
 - Develops consolidated pro forma financials that conform to accounting standards
 - Reviews and challenges component estimates and aggregate results to:
 - Ensure assumptions and outcomes are reasonable, coherent, internally consistent, and sufficiently sensitive to scenario conditions
 - Determine any necessary adjustments/overlays
 - Assesses the impact of post-stress pro forma estimates on capital



Aggregation & Presentation





Aggregation & Presentation

- Why does the aggregation process matter?
 - An aggregation process with robust controls and consistency checking helps ensure the integrity of results
 - An effective aggregation infrastructure will provide flexibility to adjust, update, and test results for sensitivity to variable changes, as needed
 - The process provides a platform for senior management to review preliminary results and an opportunity to refine models
- Why does presentation matter?
 - Through presentation of results, management has the ability to highlight or obscure the true impact of stress tests
 - The presentation of results provides outsiders (the board, supervisors, auditors) with a starting view to begin asking questions and challenging

Objective 2: Role of a Centralized Function



1. Overview of the aggregation and presentation processes
- 2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements**
3. Effective challenge of the estimation and aggregation processes
4. Data management and controls around the aggregation and presentation processes
5. Presentation of results and management reporting conventions



Role of a Centralized Function

- The stress testing process may evolve from the existing budgeting process involving a central financial planning function and the business units:
 - The budgeting process is often a good platform from which to build the stress testing process
 - It has been repeated and refined over time
 - Systems, process infrastructure, and controls are already in place
 - Budget forecasts often match baseline scenario results
 - If not, BHCs should note the reasons for the differences
 - BHCs should promote consistency across all business lines and other functions in the interpretation of stress testing inputs and scenarios



Role of a Centralized Function

- An effective aggregation process typically involves a centralized group, such as the corporate/financial planning function, that:
 - Disseminates scenarios and monitors consistency of application by the business units generating loss, revenue, and balance estimates
 - Sources estimates from the various business units
 - Evaluates the reasonableness and consistency of assumptions and results across portfolios, business lines, and other areas
 - Leverages existing business planning and reporting systems to aggregate results and develop consolidated pro forma financials
 - Analyzes and challenges the coherence of aggregate results



Role of a Centralized Function





Role of a Centralized Function

Disseminate scenarios and monitors consistency of application by the business units generating loss, revenue, and balance estimates

- Financial planning functions should have:
 - A process for consistently disseminating scenarios, assumptions, and any updates to all internal parties involved in scenario analysis
 - A monitoring process to ensure the business units and other functions are interpreting the scenarios and assumptions consistently
 - A review and challenge process once estimates are submitted for aggregation to ensure the scenario variables and assumptions were applied consistently
- These processes and key roles and responsibilities should be formalized in policies and procedures



Role of a Centralized Function

Source loss, revenue, and balance estimates from the business units responsible for generating them

- Stronger financial planning functions:
 - Assign a single person or group as the point of contact for the business units to interact with on a regular basis
 - Work with the business lines and risk units in gathering underlying data (not in isolation)
 - Have regular access and communication with senior management to ask questions and present updates
- Aggregated results should be reviewed by multiple parties
- Internal audit should review the aggregation framework



Role of a Centralized Function

Challenge the business units on their component estimates and assumptions, where necessary

- Financial planning function should have:
 - An iterative process for reviewing and challenging estimates generated by business units and other functions to ensure:
 - Individual component estimates are reasonable, internally consistent, and sufficiently sensitive to scenario conditions
 - Scenario assumptions were applied consistently
 - Business unit-specific assumptions were consistent and conservative
 - Component estimates and assumptions are coherent
 - Sufficient stature or authority to effectively challenge senior unit heads and request information on timely basis
- Review and challenge process should be documented



Role of Centralized Function

Develop consolidated pro forma financials and evaluate the coherence and reasonableness of aggregate results

- Financial planning functions should:
 - Leverage existing business planning and reporting systems to aggregate results and develop consolidated pro forma financials
 - If a firm uses standalone tools rather than using existing business planning and reporting systems, it must ensure it has robust controls
 - For example: data quality and logic checks, reconciliation processes
 - Ensure consolidated financials conform to accounting standards
 - Analyze and challenge the coherence of aggregate results
 - Are paths of loss and revenue estimates consistent with paths of balance sheet and RWA estimates and overall scenario?
 - Are post-stress outcomes less favorable than baseline outcomes?

Objective 3: Effective Challenge



1. Overview of the aggregation and presentation processes
2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements
- 3. Effective challenge of the estimation and aggregation processes**
4. Data management and controls around the aggregation and presentation processes
5. Presentation of results and management reporting conventions



Effective Challenge

- Effective challenge is critical to stress scenario analysis and the CAP
 - BHCs should challenge the reasonableness, consistency, and coherence of assumptions, estimates, adjustments, and results at multiple levels:
 - At the individual model level and as part of the aggregation process
 - By the business lines, central planning functions, and treasury
 - At the aggregate level by senior management and the board of directors
 - Scenario design and selection should be subject to review and challenge by relevant stakeholders throughout the organization
 - Board should receive sufficient information to evaluate and challenge CAP and scenario analysis results before making capital decisions, including:
 - Appropriateness of scenarios
 - Reasonableness and consistency of results, given scenario conditions
 - Impact of key limitations, assumptions, and uncertainties



Effective Challenge

- Key tools for effective challenge:
 - Documentation of:
 - Processes and methodologies
 - Key assumptions, limitations, weaknesses, and uncertainties
 - Supporting analysis and/or empirical evidence
 - Benchmark/challenger models to compare against primary model outputs
 - Sensitivity analysis around key variables and assumptions

Effective Challenge: Documentation



- BHCs should have clear, comprehensive documentation for all aspects of their capital planning processes, including:
 - Loss and revenue/expense estimation methodologies
 - Process for aggregating and evaluating component estimates
 - Key assumptions, limitations, and weaknesses
 - Application of management adjustments or overlays
- Documentation should describe BHC practices in sufficient detail to:
 - Ensure processes are transparent and repeatable
 - Allow for review and challenge
 - Provide relevant information to decision-makers
 - Allow outsiders to understand and evaluate the processes

Effective Challenge: Assumptions



- Key assumptions drive the results and should be reasonable, well supported, and clearly documented
 - Assumptions are necessary in all forecasting models and tools
 - Assumptions should be:
 - Reasonable and supported by empirical evidence or quantitative analysis
 - Conservative – that is, not favorable to the firm
 - Consistent with assumed scenario conditions
 - Internally consistent across business units and risk dimensions
 - BHCs should document all assumptions made for stress testing as well as the support for those assumptions
 - Valid models with invalid assumptions are misleading – “garbage in garbage out”

Effective Challenge: Management Adjustments



- Management adjustments should also be reasonable, well supported, and clearly documented
 - BHCs may make management adjustments or use an overlay to:
 - Account for unique risks of certain portfolios not well captured in models, or
 - Compensate for specific model and data limitations
 - Adjustments/overlays should be:
 - Reasonable and well supported – management should have valid reasons to make adjustments and provide supporting evidence
 - Conservative – adjustments should generally not make outcomes less severe
 - Clearly identified, documented, and subject to effective review and challenge
 - Adjustments may be a sign of an unreliable model (be it flawed or hard-to-quantify) or unfavorable results

Effective Challenge: Sensitivity Analysis



- Sensitivity analysis should be performed to understand how key variables and assumptions impact estimates and overall results
 - The firm should conduct sensitivity analysis on input variables and assumptions to understand the sensitivity of results to each
 - That is, change the level of each input variable or an assumption in isolation to gauge the impact of that variable/assumption on outcomes
 - Sensitivity analysis can provide insight into:
 - Limitations of a firm's models
 - Range of possible results and uncertainties of estimates
 - Results of sensitivity analysis should be reported to the board
 - Range of possible results should also be presented to the board
 - Reliance on a single result may lead to an overconfidence in forecasts

Objective 4: Data Management & Controls



1. Overview of the aggregation and presentation processes
2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements
3. Effective challenge of the estimation and aggregation processes
- 4. Data management and controls around the aggregation and presentation processes**
5. Presentation of results and management reporting conventions



Aggregation Controls

- Data management infrastructure should support the aggregation of various data inflow streams into pro forma financial statements
 - BHCs with stronger aggregation processes generally:
 - Leverage existing data management systems with greater checks and controls rather than creating standalone spreadsheet files
 - Have systems that allow for automatic updates to input data
 - Document the data management process with a comprehensive flow chart that depicts how raw data inputs feed into the final results
 - BHCs should provide an explanation for selecting the database system used for aggregation
 - They should explain the advantages and limitations of the system and be forthcoming about any issues that have arisen



Aggregation Controls

- Data management processes should be transparent and repeatable, include reconciliations, and allow for data updates
 - Transparent: Data management processes should be documented and tracked to allow an outsider to follow data through aggregation
 - Repeatable: Data management process should be formally documented in policies/procedures to protect against key person risk
 - Reconciliations: Data should be checked for accuracy through reconciliations with source systems
 - Updates: Revisions and updates to data inputs should ideally flow automatically into results with minimal manual adjustments needed



Aggregation Controls

- Other controls should be in place to maintain integrity of results, including:
 - Security controls restricting access to data management systems
 - Administrative rights vs. read-only access
 - Activity log for both editing and viewing
 - Data checks and reconciliation processes to ensure results reconcile with data sources and outputs
 - Formally defined responsibilities for reviewing the final data
 - Controls within the aggregation infrastructure to ensure compliance with accounting standards and evolving regulatory rules (Basel III)

Objective 5: Presentation of Results



1. Overview of the aggregation and presentation processes
2. Role of a centralized function in the aggregation of estimates and presentation of consolidated financial statements
3. Effective challenge of the estimation and aggregation processes
4. Data management and controls around the aggregation and presentation processes
- 5. Presentation of results and management reporting conventions**



Presentation of Results

- Results should summarize all relevant capital ratios and values for each of the scenarios in an easy-to-follow manner
 - Consolidated results should be presented in a well organized format that easily and quickly allows the board and supervisors to understand the results and key drivers
- Results should be compared to benchmarks such as previous stress test results, historical experience, and peer performance
 - Data presented in isolation limits the ability to identify outlier results which could potentially be the result of flawed forecasts
 - The board and supervisors often rely on comparisons as a sanity check and are better able to challenge the results when relevant comparison data are presented



Presentation of Results

- Summary results should contain the full path of:
 - Key capital ratios (tier 1 common, tier 1 leverage, tier 1 capital, total capital)
 - Key loss values and rates (net charge-offs by loan category, market, operational and other loss categories, provisions/ALLL)
 - Key revenue values and rates (net interest income, net interest margins, non interest income and non interest expense)
 - Balance sheet and RWA levels and changes (gross and net loans by type, investment portfolio by type, total RWA and components)
 - Other key underlying drivers
 - Key scenario variables (GDP, unemployment, interest rates)
- Results should be compared to the BHC's capital goals and targets
- Key drivers of the results should be easily identifiable



Presentation of Results

- Where available, firms should present peer data as a benchmark
 - Useful data should be available for publically traded firms
 - Examples: net charge-off rates, return on assets, loan balance growth, and dividend payout ratios
- Firms should present historical peak loss rates for firm and industry
 - Firms should present results compared to its own historical experience
 - Recent historical experience is useful, but so are the firm's experiences during times of industry or firm-specific distress
 - Firms often use historical experience to justify less-than-conservative loss, revenue and balance sheet growth assumptions – particularly firms that fared well during recent stress periods
 - Firms should consider industry data when its own historical experience is benign or envision a scenario in which the firm is not well protected



Presentation of Results

- Presentation of results to management and the board of directors should include sufficient detail to allow for effective challenge:
 - Key assumptions that could potentially have a material impact on results
 - Weaknesses and limitations of processes and methodologies
 - Management adjustments
 - Results of sensitivity analysis around key assumptions and inputs
 - Benchmarking against historical experience, previous stress tests, and peer performance
 - Risks not captured through scenario analysis



Presentation of Results

- Presentation of results should follow normal management reporting conventions (business lines, products, etc.) so that management and the board can easily interpret the results
 - Baseline results should closely resemble budgeting process results, and any significant differences should be explained
- Management reporting conventions often differ from standardized regulatory reporting conventions
 - BHCs should be able to reconcile regulatory reporting of results to internal management reporting and provide a transparent mapping

Questions?

