Integrating Economic Scenarios with Risk Simulations: Industry Perspective and Practices

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Disclaimer: The opinions and comments expressed in this presentation are my own and do not necessarily reflect those of CIBC
Introduction

The financial crisis highlighted a series of weaknesses in stress testing practices, including scenario development & analysis.

**Before and during the crisis**
- Limited senior management involvement
- Limited qualitative expert judgment in scenario development
- Reliance on historical statistical relationships
- Moderate scenarios in terms of severity
- Changing risk characteristics in stressed conditions

**Post-crisis and current state**
- Updated stress testing framework: more integrated, robust and fulsome
- Regulatory driven macroeconomic scenarios
Regulatory Driven Stress Testing Framework

Many stress scenarios (especially in regulatory driven approaches) are formulated in terms of economic variables

- Incorporating regulatory driven macroeconomic scenarios intro stress testing
- Defining stress scenarios and the impact on relevant macroeconomic variables and relevant risk drivers using in-house expertise

Bank of England’s 2016 macroeconomic stress scenario:
- Global downturn in output growth;
- UK GDP falls 4.3%;
- UK unemployment rises by 4.5%;
- Price of oil US$20 per barrel;
- Volatility in financial markets and global currencies depreciating against U.S. dollar;
- Household and business interest rates rising;
- UK property prices fall 31%; UK CRE prices fall 42%.
Stress Testing Framework

Governance

- Model Risk Management
- Validation and Governance

Model Development

- Model Specification, Estimation & Calibration

Model Implementation

- Scenario Management & Model Execution

Consolidation & Reporting

- Regulatory & Management Reporting

Data and Model Staging

- Inventory of Models
- Stress Testing Data Mart
- Results Data Repository

Data Sourcing

- External Market Data
- Portfolio Data
- GL Data
- 3rd Party Data
- Parameters
- Transactions

Data Validation and Aggregation

- Risk Data Aggregation and Reporting
- Rules, Metrics, Dynamic Hierarchies

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Key Areas in Stress Testing

- Integration & Coordination
- Measurement & Monitoring
- Reporting & Analytics
- Model Management
- Data Management
- Implementation & Execution
Regulatory Guidance on Stress Testing - OSFI

Stress testing practices in Canadian banks are governed by the OSFI’s E-18 Guideline on Sound Business and Financial Practices.

The Guideline focuses on the following areas:

- Purpose of stress testing
- Role of the board and senior management
- General considerations for stress testing programs
- Methodology and scenario selection
- Specific areas of focus and supervisory considerations
Regulatory Guidance on Scenario Selection & Analysis

- Encompassing the most relevant and material risks
- A variety of scenarios, including historical and forward-looking hypothetical scenarios
- Flexibility and no “failure of imagination”
- Severe shocks and periods of sustained downturns
- Challenging the viability of institutions
- Interrelations between various factors
Current Market Practices in Scenario Development

Defining stress scenarios: factors to consider

- Historical & hypothetical events
- Portfolio specific (industry, product, region)
- Alignment with regulatory macroeconomic stress test scenarios
- Subject matter experts (business and economics) feedback
- Senior management feedback
- Consistent with regulatory stress testing framework
Developing stress testing models and translating economic variables

- Statistical models (based on historical data)
- Subject matter experts’ feedback (business, economics, finance)

Challenges in scenario analysis

- Historical events used for scenarios and models
- Qualitative assumptions and estimates
- The need for large amounts of data
CIBC Enterprise-Wide Stress Testing

Scenario Development
- Develop macro economic scenarios relevant to the current and projected business cycle including emerging risks

Risk Identification/Modeling
- Identification of relevant risk drivers
- Development and validation of stress modules and parameters

Translation of financial and macro economic factors (e.g., GDP, unemployment, yield curve, etc.)

Quantify impacts
- Credit
- Market
- Operational
- Liquidity
- Earnings
- Other

Aggregate Results
- Earnings
- Capital Impacts
- Funding and Liquidity

Evaluate and review bank-wide impacts

Linkages

Internal Capital Adequacy Assessment Process (ICAAP)
- Risk Appetite
- Capital Planning and Management
- Financial Planning and Management
- Liquidity Management
- Recovery and Resolution Planning
- Risk Management

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Key Assumptions in Enterprise-Wide Stress Testing

**Infrastructure**
- Data
- Integration
- Systems/IT
- Resourcing

**Modeling**
- Credit Risk
- Market Risk
- Operational Risk
- ALM
- Pre-Provision Net Revenue

**Validation**
- Independence
- Challenger and benchmarks
- Governance and controls
1. Empirically validating assumptions and estimates

2. Numerous business processes and functional areas impacted

3. Strong governance and effective internal controls to be included in validation and testing framework

4. Expect senior management and the board to understand not only the results of stress testing but also the key assumptions and limitations to help facilitate effective challenge

5. Best practices - work in progress
Questions?