Tools for Measuring OpRisk: Lessons Learned from U.S. Regulatory Exercises

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Outline

- Recent initiatives provide a good overview of tools for modeling operational risk, and of how regulators are looking at this risk:
  - Benchmarking Project
  - Quantitative Impact Study
  - Loss Data Collection Exercise
- Operational risk modeling is beginning to evolve from a “proprietary” to a “public” field.
  - A brief overview of the public body of knowledge.

Benchmarking Project

- Objective is to identify the range of operational risk measurement and management practices for the purpose of:
  - Assessing the range of practices at mandatory institutions relative to the proposed AMA standards.
  - Identifying open policy and implementation issues.
  - Enhancing industry understanding of U.S. supervisory expectations.

Project Scope

- Three week on-site review of operational risk management processes and practices.
- Included all mandatory Basel II institutions.
- Review covered all aspects of the AMA supervisory guidance.

Project Methodology

- Corporate Governance
- Data
- Risk Quantification

Focus of this presentation.

Corporate Governance

- Involvement of the Board & Senior Management.
- Clearly articulated OpR management framework.
  - Firm-wide standards, consistently communicated
  - Independent OpR management function
  - Line of business management oversight
  - Independent testing & verification
  - Monitoring & reporting
- Is there business line buy-in?
- Integration of AMA into risk management process

Data

- Internal data
- External data
- Scenarios
- Business Environment & Internal Control Factors

Internal Data

- Comprehensive definition of operational risk.
- Sound platform for collecting loss data.
- Loss thresholds chosen to capture material exposure (may vary by BL or Risk Type).
- Framework for validating the comprehensiveness of data.
- Policies that
  - determine the timing of OpR loss events.
  - resolve boundary issues.

External Data

- Is there a clear policy for when internal data should be supplemented with external data?
- Is there a well-reasoned process for determining which external losses are relevant?
- Are external data scaled or otherwise adjusted?

Scenario Analysis

- A policy for when, how scenarios used.
- The process for constructing scenarios:
  - Expert judgments to assess likelihood & impact of plausible, severe OpR losses
  - Role of internal and external data.
- A process for evaluating effectiveness and comprehensiveness of scenarios.
- Documentation.

Business Environment & Internal Control Factors

- What is the process for assessing inherent risks and the effectiveness of controls?
- Who is responsible for developing and overseeing the use of BE&ICFs?
- Aggregation and reporting.
- Incorporation in AMA model.
- Periodic validation vs. actual loss experience.

Quantification Framework

- What framework is used to estimate the Bank's OpR exposure?
  - e.g., LDA, scorecards, scenarios...
- How does the framework combine the four "critical elements" of an AMA?
- What are the weightings given to each element?

Quantification

- What are the critical technical assumptions (e.g., distributions)?
- How does the framework account for correlations across BLs and/or ETs?
- What is the unit of measurement?
- Treatment of EL?

Documentation

- Is there a document describing the overall modeling approach and philosophy?
  - Why were certain modeling choices made, and what alternatives were considered?
- Is there a detailed document discussing data, distributions, parameters and other specific model elements?
  - Can one determine what changes have been made to these and why?

Risk Mitigation

- Does the Bank use risk mitigation tools in the management of OpR exposure?
- What is the Bank's strategy in using insurance products – focused on transfer "tail risk" or employed more broadly?
- Does the level of purchased insurance for OpR approach the Basel 20% cap?

Summary of Findings

- Operational Risk Management Frameworks are in various stages of implementation.
- Tangible confirmation of the significant work undertaken by institutions.
- All institutions are making progress with regard to Data, although in different ways.
- Quantification is generally the least advanced section of the framework.

Next Steps

- Results of the project will be shared with the participating institutions.
- Gathered feedback will be used to modify/clarify U.S. supervisory guidance and rulemaking.

The Operational Risk QIS and LDCE

What are the QIS and LDCE?

- The operational risk portion of QIS asks for various estimates of firms’ operational risk exposure, together with questions regarding model that generated these estimates?
- The Loss Data Collection Exercise [LDCE] asks firms for the internal loss data underlying their QIS results.

QIS Objectives

- How does the range of practice translate into comparable exposure estimates?
- Assess the impact on capital at industry level.
- Assess cross-firm consistency.
- Identify possible areas for additional guidance.

LDCE Objectives

- Understand data completeness.
- Understand QIS results
  - How much weight is given to internal data?
- Investigate key technical issues
  - Sensitivity to distributions.
  - Calculating capital for legal entities.
  - Correlation

Why another QIS and LDCE?

- Few banks were capable of comprehensive AMA results in the previous QIS.
- The new QIS (oprisk portion) also asks more granular questions tailored to current policy issues.
- Previous LDCE submissions were short, incomplete time series.

Logistics

- Timeline:
  - Oct ’04: send invitations to banks.
  - Nov ’04: receive LDCE responses.
  - Jan ’05: receive QIS responses.
  - Feb-Mar ’05: On-site work.
  - Apr ’05: results presented to regulators.
- Participation is voluntary.
- Materials available at www.ffiec.gov.

QIS Questions 52-53

- What ... statistical distributions (e.g., frequency and severity) were used to fit loss data? Did these vary by data type (i.e. internal, external, scenario), business line, or event type? If so, how?
- Were adjustments are made to internal or external data to account for changes in the scale or scope of the business, or factors such as inflation?

QIS Question 54: Correlation

- Describe any correlation ... assumptions used as part of the operational risk exposure calculation.
- What model parameters were used [for] these assumptions?
- Describe how you arrived at these assumptions.
- If there is a diversification benefit, is that amount held at the consolidated entity level or allocated back to the business line? If so, how?

QIS Questions 55-56: EL/UL

- Does the operational risk exposure number ... represent the sum of EL plus UL, or UL only?
- If the operational risk exposure number represents UL only, provide the following:
  - Describe how EL is accounted for (GAAP-compliant reserves/provisions, pricing or other internal business practices).
  - Provide the EL amounts, and describe how EL is derived (e.g. statistically measured, subjective estimation, etc.).

QIS exposure worksheet

- Total AMA capital charge.
- Drill-down on certain key issues:
  - Exposure without diversification adjustment.
  - Exposure without insurance offset
  - Exposure without qualitative adjustments.

LDCE exposure worksheet

Internal Event Types

Internal Business Lines

		ET1	**ET2**	**...**
BL1	Operational Risk Exposure			
	Methodology (I, E, or S)			
BL2	Operational Risk Exposure			
	Methodology (I, E, or S)			
...	Operational Risk Exposure			
	Methodology (I, E, or S)			

What was the output from the last LDCE?

- A BIS paper containing descriptive statistics by business line and event type.
- Feedback to participating institutions.
- Several studies investigating key technical issues.

Operational Risk Modeling:

What we can learn from public sources.

An overview of publicly available information.

Summary of Elements of AMA Framework for Large U.S. and European Banks

Institution	Intends to pursue AMA for OpRisk	Has published an OpRisk Capital Estimate	Internal Loss Data	External Loss Data	Self Assess-ments	Scenarios
		Y			Y	
	Y	Y	Y	Y[c]	Y	Y
			Y	Y	Y	Y
	Y		Y			Y
	Y		Y	Y	Y	Y
	Y	Y	Y	Y[c]	Y	
	Y	Y	Y	Y[c]	Y	
			Y	Y	Y	
			Y			
	Y		Y	Y[c]	Y	Y
			Y	Y[c]	Y	
	Y	Y	Y	Y[c]	Y	
	Y	Y	Y	Y	Y	Y
	Y		Y	Y	Y	
	Y		Y	Y		Y
			Y	Y[e]		
			Y	Y[c]		

Modeling framework

- Public documents and presentations suggest that many banks are using an LDA-like approach.
- The difference between banks lies in the emphasis given to each of the four elements.

Internal data

- Many banks are collecting internal data.
- Some are successfully modeling these data.
- Research suggests this can yield reasonable results that are consistent across banks.
- Variation across business lines and event types (LDCE)

External data

- Many financial institutions are buying public datasets and/or participating in consortia.
- Qualitative use of these data is frequently referred to.
- Statistical use may be less frequent, perhaps due to scaling and reporting bias.
- It is possible to correct for reporting bias and obtain “reasonable” estimates using external data.

Scenario analysis

- Scenarios seem to be a popular approach for modeling tail events.
  - There appear to be two distinct approaches to scenario analysis.
- A few observations.
  - Importance of training
  - The possibility of cross-sectional validation.

Conclusion

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Questions?