Overview of the Current Range of AMA Practice in the U.S.

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Agenda

- Recent regulatory exercises relating to AMA
  - AMA Benchmarking Exercise
  - QIS-4 OpRisk results
  - Loss Data Collection Exercise (LDCE)
- Current range of practice – Data Elements
  - Internal Data
  - External Data
  - Scenario Analysis
  - Business Environment and Internal Control Factors
- Current range of practice – Quantification
- Overview of model output and results

Disclaimers and Caveats

- The analysis is based on information gathered from institutions on a voluntary basis.
- Conclusions are based on preliminary analysis. Caution should be exercised in the use of the data and conclusions.
- Some information is now dated, so results may not reflect current practices.
- Unless otherwise noted, any discussion of QIS-4 results reflects only the Operational Risk portion of the survey and may not convey the entirety of the results or analysis.

AMA Benchmarking Exercise

- Objective was to understand management and measurement of operational risk at 9 domestic mandatory institutions.
  - Occurred in 2004.
  - Mergers, growth, other factors affected the population of mandatory institutions during the review period.
- A "deep dive" review focusing on processes and structures underlying governance, data, and quantification.
  - Draft Supervisory Guidance on Operational Risk AMA was used as basis of review.
- Reviews were not exams or prequalification reviews; no testing was performed.
- Focus was on entire framework rather than exposure estimates.
- Aggregate results were released at Boston Fed conference in May 2005.

QIS-4

- Objective was to understand the likely effect of proposed Basel II MRC standards at the industry, institution and portfolio level.
  - Submission in 4Q2004. Analysis in 1H2005.
  - Consisted of worksheets and questionnaires.
  - Results furthered our knowledge of range of practice as well as identifying issues where additional work or guidance are needed.
- Focus was on exposure estimates.
- 26 institutions participated in QIS-4, with 24 providing information for operational risk.
  - 14 banks based their OpRisk exposure estimates on AMA-like frameworks.
- OpRisk results were released at Boston Fed conference in May 2005.
- Feedback sessions were conducted with participating institutions.

Loss Data Collection Exercise

- Objective was to better understand the OpRisk exposure estimates reported in QIS-4, and to better understand the completeness of the loss data on which these estimates are based.
  - Submissions in 4Q2004, Analysis in 1H2005 and ongoing.
  - Requested data on individual losses underlying QIS4 OpRisk results.
- Focus is on data analysis and statistics.
- We received 23 LDCE responses between December 2004 and April 2005.
- Results were released at Boston Fed conference in May 2005.
- Feedback sessions were conducted with participating institutions.

Observations on Data Elements

- Results from QIS-4 and the Benchmarking Exercise suggest the following:
  - Institutions have made considerable progress in developing internal loss data collection systems.
  - Many institutions have acquired external databases, but use of external data varies considerably.
  - Institutions have begun using scenario analysis, but significant work remains in this area.
  - Many institutions are using some form of tools to assess Business Environment and Internal Control Factors (BE&ICF).

Internal Loss Data - Benchmarking

- All institutions use, or map to, the seven Basel event type categories, including two that use additional categories.
- All institutions have, or are in process of establishing, formal processes for identifying loss events, and determining database inclusion.
  - Aggregating multiple data points into a single event
  - Identifying near misses
  - Capturing boundary events
- Little if any robust analysis to support the appropriateness of loss thresholds.
- The testing and verification of database accuracy were only in the beginning stages at the time of the benchmarking exercise.
  - Additional work has been seen since then.

Internal Data Observations (from LDCE)

- 23 participants submitted 1,526,765 losses totaling $25.9BN.
- Participants reported varying numbers of losses. Six reported fewer than 250 losses, while four reported more than 2,500 losses.
- Data thresholds ranged from $0 (six participants) to more than $10,000 for some or all business lines (three participants).
- There was variation in the number of years' data collected:
  - Three participants' data went back to 1999 or earlier.
  - Thirteen participants' data went at least as far back as 2001.
  - Five participants' data began in 2003.
- There was also variation in reported data completeness.
  - Ten participants indicated that their data were fully complete.
  - Seven participants indicated that their data were partially complete.
  - Six participants did not provide information on completeness.

Overview of LDCE Data

- Loss frequency by business line.
  - 60.1% of the submitted losses were in Retail Banking.
  - Trading & Sales and Retail Brokerage each had 7.3% of the losses.
  - Corporate Finance had the smallest proportion of losses (0.3%).
- Loss frequency by event type.
  - External Fraud events accounted for 39% of the number of losses.
  - 35.3% of the losses were associated with an Execution, Delivery, and Process Management event.
  - Damage to Physical Assets and Business Disruption and System Failure each had the smallest proportion of losses (0.7%).
- Loss severity.
  - 70.8% of the total amount of LDCE losses were from losses in the “Other” business line.
  - 79.8% of the total loss amount represented losses from Clients, Products and Business Practices events.

External Data – Benchmarking and QIS-4

- Sources most often observed were vendors and consortium.
- External data were an indirect input for approximately one-third of the QIS-4 banks with working AMA frameworks.
- External data were a direct input for one-half of the QIS-4 banks with working AMA frameworks.
- Remaining institutions had either not acquired external data or had not incorporated it into their analytical framework.
- Selection and scaling criteria for external data are under development.
  - Documentation of selection criteria varies.

Scenario Analysis – Benchmarking & QIS-4

- At banks with working AMA frameworks, scenario analysis was identified as:
  - a significant driver of the operational risk capital charge for at least one quarter
  - the most significant operational risk input for over one-third
- There was wide variation in the construction and granularity of scenarios.

Business Environment and Internal Control Factors - Benchmarking and QIS-4

- Most institutions have some form of tools to assess BE&ICF.
  - Scorecards, RCSA, etc.
- The level of granularity varied within and across institutions.
- Some progress was noted in linking the BE&ICF results with actual loss experience.
- However, for capital purposes:
  - Only one-half of the QIS-4 banks with working AMA frameworks had developed processes to incorporate BE&ICFs.
  - Of those, most used BE&ICF as a qualitative adjustment in allocating capital to Line of Business (LOB) or to business units.

Data Element Challenges

- Internal data:
  - Treatment of losses in “other” category: loss vs. event reporting, business line attribution, timing.
- External data:
  - Scaling external losses to account for size and control environment is an area of ongoing development
  - Documentation of selection/filtering process varied and was not sufficiently specific.
- Scenario analysis:
  - How to best link with quantification?
  - Documentation of scenario process varied and was not sufficiently specific.
- Qualitative Adjustments:
  - How to aggregate the detailed information that is often available via BEICF’s to obtain exposure adjustments.

Quantification Conclusions from QIS-4

- Progress was being made in AMA implementation, with some institutions beginning to have credible, risk-sensitive measures of operational risk exposure.
- Institutions appeared to be converging toward LDA-type approaches with considerable variation in model specifics across institutions.
- Significant bank and supervisory challenges remain in building and validating AMA frameworks.

Progress is being made

- Benchmarking review - only 4 or 5 institutions had working AMA models - none fully robust.
- QIS4 – 6 months after benchmarking:
  - 24 institutions submitted an oprisk exposure estimate
  - Over half of the institutions had working AMA frameworks,
  - None fully met ANPR OpRisk standards
- Of the 14 institutions with AMA-like frameworks, all are using some variant of the Loss Distribution Approach (LDA).
- But methodologies vary significantly.

Use of the four elements

- There is variation in the weights assigned to each element, and not all banks employ all four elements of the AMA framework.
  - Scenario analysis and BE&ICFs were the least used elements.
  - When used, scenario analysis had a significant effect on the resulting operational risk capital estimate.
- There was considerable variation in the quantitative techniques underlying each element.
- Finally, there was variation in the mechanics of how the elements were combined.

Unit of measure – QIS-4

- The level of AMA granularity seen in QIS-4 varied significantly, with the number of units of measure ranging from 1 to over 100.
- Several banks submitted only ‘top of the house’ AMA capital computations.
- The others computed capital at LOB or loss event type level, or some combination of the two.

Diversification

- Institutions were taking varying approaches to estimating diversification effects, all rudimentary.
  - Correlation levels relied more on judgment rather than statistical analysis.
- There is a range of diversification benefits.
  - Over one-half of the AMA banks in QIS-4 assumed no dependence across business lines and event types.
  - The average capital benefit obtained from taking diversification into account was 33% of undiversified capital.
- There was a relationship between diversification effects and the number of units of measure.

Expected Losses

- Institutions indicated in the Benchmarking Exercise that they preferred a UL-only approach.
- However, the majority of the 14 AMA institutions submitted QIS-4 oprisk exposure estimates on a EL+UL basis.
  - Less than half of the banks with working AMA frameworks provided specific estimates of EL.
  - Answers to questions posed in QIS-4 regarding support of EL offsets for operational risk were limited and not very useful.
  - Only one institution attempted to show that EL included small operational losses.

Model Output - QIS-4 Results

- Federal regulators released summary findings of QIS-4 on February 24, 2006:
  - Results indicated that aggregate minimum risk-based capital requirements* would fall 15.5% for the 26 QIS-4 participants when moving from the current Basel I-based framework to a Basel II-based framework.
  - The results also showed material dispersion in minimum risk-based capital requirements across institutions and portfolios.
- Results also showed that Operational Risk accounted for 10.5% of Basel II MRC.
- QIS-4 results for Operational Risk were also shared with LDCE participants as part of the LDCE feedback process.

* This number refers to the effective minimum risk-based capital requirement.

Normalized AMA Capital

Estimated Operational Risk Capital as a Percentage of Total Assets, Tier 1 Capital, and Gross Income

		AMA Capital Divided by Total Assets	AMA Capital Divided by Tier 1 Capital	AMA Capital Divided by Gross Income
Unadjusted AMA Capital				
	Cross-firm median	0.43%	6.34%	11.04%
	Interquartile range	(0.37% - 0.53%)	(5.36% - 8.42%)	(8.41% - 12.67%)
AMA Capital Adjusted to include EL and exclude Insurance and Qualitative Adjustments				
	Cross-firm median	0.53%	7.19%	12.81%
	Interquartile range	(0.37% - 0.65%)	(5.75% - 10.39%)	(9.64% - 15.23%)
AMA Capital Adjusted to include EL and exclude Insurance, Qualitative and Dependence Assumptions				
	Cross-firm median	0.43%	6.45%	9.46%
	Interquartile range	(0.37%-0.70%)	(6.17%-9.05%)	(7.41%-14.22%)

Capital Coverage of Operational Losses

Unadjusted AMA Capital as it Relates to the Frequency of Losses Reported in the LDCE

	Losses ≥ $20,000	**Losses ≥ $100,000**	**Losses ≥ $1M**
Cross-firm median	3.0	14.0	134.6
Interquartile range	(2.6 - 4.4)	(10.3 - 15.8)	(103.8 - 167.0)

Questions?