



Implementation of an OpRisk Framework: A Supervisory Perspective

prepared for:

OpRisk

A practical guide to implementing and
embedding the operational risk function

March 25 & 26th

New York, NY

John S. Jordan

Federal Reserve Bank of Boston

Outline

- Supervisory Initiatives
 - SR 99-18
 - Basel II
- Benchmarking
 - SR 99-18
 - Basel II
- Supervisory Assessments of OpRisk Management
 - OpRisk Corporate Governance
 - OpRisk Data
 - OpRisk Quantification Techniques
- Supervisory Challenges



Supervisory Initiatives

Supervisory Initiatives: SR 99-18

- Current Supervisory Expectations: SR 99-18
 - “Assessing Capital Adequacy in Relation to Risk at Large Banking Organizations”
 - Bank must *identify and measure* all material risks
 - Operational risk cited as material risk
 - Regulatory capital ratios no longer sufficient in the assessment of capital adequacy for large complex organizations
 - Distinction made between “Regulatory Capital” and “Economic Capital”
 - Capital provides incentive to manage OpRisk

Supervisory Initiatives: Basel II

- Supervisory Expectations in the Years Ahead: Basel II
 - Advanced Measurement Approach (AMA)
 - Flexible approach based on banks' internal model
 - Promote enhancement to risk measurement and management techniques
 - Accommodates innovation over time
 - Supervisory expectation is that largest and most complex US institutions will be AMA
 - Capital provides incentive to manage risk



Benchmarking

Benchmarking under SR 99-18

- Assessing compliance with SR 99-18:
 - Guidance states that examiners should assess a bank's:
 - Progress relative to former practice
 - Progress relative to peers
 - Not different than “typical exam work”
 - Benchmarking is currently an important means to migrate best practice
 - “Best practice” encouraged
 - “Sound practice” expected
 - “Trailing practice” cited
 - For OpRisk, we are increasingly seeing “emerging practice”
 - Approaches appear reasonable
 - We are assessing such practices as “sound” or “best”

Benchmarking under Basel II

- Basel II
 - Benchmarking will be equally important
- Basel II provides more structure than SR 99-18
 - Minimum Elements for OpRisk Framework
 - Internal data collection
 - Reference to relevant external data
 - Scenario analysis
 - Business activity/control factors
 - Minimum Criteria
 - Credible estimate of tail of OpRisk loss distribution
 - Low frequency, high severity events must be considered
 - “Use Test” - integrated into day-to-day management

Assessments of Compliance with SR 99-18

- OpRisk assessments are being made in 3 areas:
 1. *OpRisk Corporate Governance Structure*
 - Business lines “own” the risk
 - But important roles for:
 - Corporate OpRisk Management Function
 - Board of Directors
 - Internal Audit
 2. *Operational Risk Data*
 - Loss event databases
 - Business line risk assessments (for example: CRSE)
 - Early Warning Systems (for example: KRIs)
 3. *Quantification Techniques*
 - Techniques to determine exposure
 - Assessing the likelihood and impact of “tail events”



1. OpRisk Corporate Governance Structure

OpRisk Corporate Governance Structure

- Business Lines “own” the Risk
 - Primary responsibility for the daily management of OpRisk continues to reside at the business line
 - Business lines are the ones taking on the risk
 - Business lines are in a position to assess, monitor, and mitigate the risk
- Emerging Practice has a Corporate OpRisk Function Independent from Business Lines
 - Corporate function facilitates:
 - Reporting
 - Aggregation
 - Monitoring

OpRisk Corporate Governance Structure

- Emerging Practice: A role for a formal Corporate OpRisk Function:
 - Defines OpRisk
 - Develops corporate OpRisk policies & procedures
 - Develops key OpRisk management tools and related MIS
 - Reports pertinent information to senior management and board
 - Develops and implements an OpRisk mitigation strategy
 - Coordinates insurance risk mitigation strategies
 - Ensures staff has adequate training and experience
 - Fosters effective communication of OpRisk management throughout the bank
 - Ensures consistent and comprehensive collection of operational loss events
 - Develop quantitative models to estimate OpRisk exposure
 - Meld quantitative and qualitative risk measurement techniques

OpRisk Corporate Governance Structure (cont.)

- Emerging Practice: A Role for the Board of Directors
 - Awareness of material operational risks
 - Approve and review banks' OpRisk management framework
 - Understand relationship between Strategic Plan & OpRisk
 - Ensure relationships exist between Senior Management, Corporate OpRisk Function, Business Line OpRisk function, OpRisk Capital Allocation Team, Internal Audit, etc.
- Emerging Practice: A Role for Internal Audit
 - Assessment and Validation of:
 - Business line OpRisk management function
 - Corporate OpRisk Management Function
 - OpRisk capital allocation process
 - Emerging Practice has Audit independent of OpRisk Function

2. OpRisk Data

Operational Loss Event Data

- Emerging Practice: Firm-wide consistent and comprehensive capture of operational loss events
 - How?
 - Firm-wide consistent definition
 - many are using the Basel definition of of operational loss: “The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events”
 - Focus on objective, measurable event types
 - Data tends to be captured above specified threshold
 - Develop a technology platform that crosses firm
 - many web-based
 - some linked to GL where possible
 - often “hybrid” systems
 - Training of business lines about policies and procedures
 - Auditable process

Operational Loss Event Data (cont.)

- For most business line/loss types, the “high-level” definition is sufficient to provide guidance on what constitutes an event
- However, for some types of events, banks are looking to supervisors for more guidance on OpLoss definition
 - Some banks are looking for more guidance on issues such as:
 - ⇒ When does an event become an event - the “short-lived” event
 - ⇒ When should many small events caused by a single factor be assumed to be one large event
 - ⇒ What is the appropriate threshold to capture loss events and does it vary by business line/loss type - high frequency vs. low frequency events
 - ⇒ What associated expenses should be in the cost of an event (salaries, overtime, legal fees, etc.) - major isolated expenses are easy to capture but smaller widespread expenses more difficult

Benchmarking Operational Loss Data

		Loss Event Types						
		Internal Fraud	External Fraud	Employment Practices & Workplace Safety	Clients, Products & Business Practices	Damage to Physical Assets	Business Disruption & System Failures	Execution, Delivery & Process Management
Business Lines	Corporate Finance	obs % of Total Obs Aggregate Loss as % of Total Loss	<50 0.14% 0.04%	<10 0.04%	>50 27.58% 1.21%	>50 1.21% 0.87%	>50 2.16% 2.88%	>50 0.87% 2.88%
	Trading & Sales	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.00%	>50 0.00%	<10 0.02%	<10 0.08%	<10 0.03%	<10 0.11%
	Retail Banking	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 7.20%	>50 40.47%	>50 2.08%	>50 1.74%	<10 0.03%	>50 6.39%
	Commercial Banking	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 0.37%	>50 3.18%	<50 0.19%	<50 0.48%	<10 0.01%	>50 0.24%
	Payment & Settlement	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 1.14%	<10 0.05%	<10 0.01%	<10 0.00%	<10 0.01%	<10 0.00%
	Agency Services	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 0.00%	>50 0.00%	>50 0.00%	>50 0.00%	>50 0.00%	>50 0.00%
	Asset Management	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.03%	>50 0.25%	>50 0.20%	>50 0.60%	<10 0.00%	>50 0.11%
	Retail Brokerage	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 0.04%	>50 1.54%	>50 0.06%	>50 26.22%	>50 1.54%	>50 5.84%

Legend: 0 obs 1-10 obs 11-50 obs > 50 obs

		Loss Event Types						
		Internal Fraud	External Fraud	Employment Practices & Workplace Safety	Clients, Products & Business Practices	Damage to Physical Assets	Business Disruption & System Failures	Execution, Delivery & Process Management
Investment Banking	Corporate Finance	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.14%	<10 0.04%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%
	Trading & Sales	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.00%	>50 0.00%	<10 0.02%	<10 0.08%	<10 0.03%	<10 0.11%
Banking	Retail Banking	obs % of Total Obs Aggregate Loss as % of Total Loss	<50 1.50%	>50 55.45%	<10 1.09%	<50 1.91%	<10 0.41%	<50 2.86%
	Commercial Banking	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 1.08%	>50 20.45%	>50 1.08%	>50 3.45%	>50 1.08%	>50 1.40%
	Payment & Settlement	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.36%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%
	Agency Services	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.14%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%
Others	Asset Management	obs % of Total Obs Aggregate Loss as % of Total Loss	<10 0.14%	<10 0.14%	<10 0.00%	<10 0.00%	<10 0.00%	<10 0.00%
	Retail Brokerage	obs % of Total Obs Aggregate Loss as % of Total Loss	>50 0.10%	>50 0.04%	>50 0.00%	>50 0.00%	>50 0.00%	>50 0.00%

Legend: 0 obs 1-10 obs 11-50 obs > 50 obs

- Assessing adequacy of bank's data collection
 - Mapping to matrix reveals "gaps"
 - Definition gaps
 - Capture gaps
 - Tail event gaps
 - Validation comes from across industry comparisons
 - Validation comes from understanding of large historical events
 - Validation comes from in-depth discussion with banks about data collection

Business Line Early Warning Systems

- Emerging Practice: Emerging Practice has banks creating a comprehensive and consistent firm-wide framework with summary reports receiving senior management attention
- Early Warning Systems are being used more formally
 - Traditionally, certain business lines tracked their own key performance indicators, key risk indicators, key risk drivers, etc. These systems are designed to be “real time” or “forward-looking”
 - Emerging practice have banks determining threshold levels in key risk indicators, when exceeded, alert management to areas of potential problems
 - Emerging Practice has quantitative analysis linking risk indicators to OpLoss data
 - Causal Modeling

Business Line Risk Assessments

- Emerging Practice has banks creating a comprehensive and consistent firm-wide framework with Business Line Risk assessments summary reports receiving senior management attention
 - These assessments take on different forms across banks - including Scorecards, Self Assessments, and Audit Scores. All tend to be tailored to business line, and are designed to be “real time” and/or “forward-looking”
 - The level of coordination between business line managers, risk managers, and senior management differs across banks
 - Common Features: Develop a score for each business unit that assess:
 - Inherent, Controls, Residual
 - Emerging Practice has quantitative analysis linking risk assessments to OpLoss data

3. Quantification Techniques

Quantification Techniques

- Emerging Practice: “Bottom-up” techniques that capture specific characteristics of different business lines
 - How?
 - Techniques applied to internal data, external data, or “constructed data” (e.g., scenarios)
 - Incorporation of relevant tail events not reflected in internal loss experience (external data or scenarios)
 - Incorporation of business line assessments of inherent risks/controls
 - Capture risk mitigation/insurance
 - Recognition of correlation effects
 - Allocation of economic capital to business lines to give incentives for better risk management and controls

Quantification Techniques (cont.)

- Operational Loss Distribution Approaches:
 - Model frequency and severity to formulate an operational loss distribution
 - Challenge to understand appropriate modeling of the “tail” of the severity distribution
 - Challenge to understand which distributional assumptions are appropriate
 - Does the bank have sufficient data?
 - internal, external, “synthetic”, combination
 - How granular is the analysis - business unit/loss type?
- Scorecard Approaches:
 - Models require determination of capital at the corporate level (loss distribution?)
 - Allocates capital pool to business lines based on scorecard
 - Designing the scorecard: indicators, risk coverage
 - Calibrating the scores and linking to capital changes
- Scenario Approaches:
 - Qualitative scenarios
 - “Structured Scenarios”
 - Frequency/severity/correlations
 - Do scenarios capture relevant risks?
 - How does one validate exposure amounts generated from analysis?
- Hybrid Approaches:
 - Combines elements of all of the above

Implementation Details are Important

- An Example: For LDAs, statistical assumptions are important
 - Frequency Distribution:
 - Non-parametric? Semi-parametric? Parametric?
 - Poisson, Negative Binomial
 - Severity Distribution:
 - Non-parametric? Semi-parametric? Parametric?
 - Lognormal, Exponential, Weibull, Log-exponential, Gamma, etc.
 - “Capturing the tail”
 - Threshold Analyses - EVT
 - Mixed Distributions
 - Fat-tailed Distributions
 - Aggregation methods
 - Correlations
 - Historical, “Stress”, others
 - Pooling/Scaling Data



Supervisory Challenges

Supervisory Challenges

- To assure consistent treatment of banks by supervisors:
 - Supervisors will have to assess adequacy of:
 1. Bank's OpRisk Corporate Governance Structure
 2. Bank's OpRisk Data
 3. Bank's OpRisk Quantification Techniques
- “Across industry” perspective will be vital for successful implementation, whether its SR 99-18 or Basel II
 - Important to have dialogue with the industry so supervisors can develop acceptable data standards
 - Given the resources now being devoted to developing quantification techniques, supervisors will be assessing the reasonableness of various approaches
 - Given the resources now being devoted to developing early warning systems and business line risk assessments, supervisors will be assessing the appropriateness and accuracy of chosen factors