

Operational Risk

*Presentation at World Bank Seminar:
Assessing, Managing and Supervising Financial Risk*

May 1, 2003

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Outline

- What is operational risk
- Why banks and supervisors are pursuing quantification of operational risk
- Current Basle II timetable and framework for operational risk
- A detailed look at the Advanced Measurement Approach
- Supervisory challenges
- Basle Sound Practices Paper on operational risk

Basle Operational Risk Definition / Framework

- “The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events”
 - This definition includes legal risk
 - Strategic and reputational risk are excluded
- Operational Risk is not:
 - All risk other than credit and market
 - Only systems & IT related
 - New

		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							
	Trading & Sales							
	Retail Banking							
	Payment & Settlement							
	Agency Services							
	Commercial Banking							
	Asset Management							
	Retail Brokerage							

Examples of Operational Loss Events

- *Internal Fraud:* Allied Irish Bank, Barings, and Daiwa Bank Ltd - \$691 million, \$1 billion, and \$1.4 billion, respectively - fraudulent trading.
- *External Fraud:* Republic New York Corp. - \$611 million - fraud committed by custodial client.
- *Employment Practices and Workplace Safety:* Merrill Lynch - \$250 million - legal settlement regarding gender discrimination.
- *Clients, Products & Business Practices:* Household International - \$484 million- improper lending practices; Provident Financial Corp. - \$405 million- improper sales and billing practices.

Examples of Operational Loss Events

- *Damage to Physical Assets:* Bank of New York - \$140 million - damage to facilities related to September 11, 2001.
- *Business Disruption and System Failures:* Solomon Brothers - \$303 million - change in computer technology resulted in “unreconciled balances”.
- *Execution, Delivery & Process Management:* Bank of America and Wells Fargo Bank - \$ 225 million and \$150 million, respectively - systems integration failures / failed transaction processing.

Bank's Recognize the Significance of Operational Risk

- More than 100 losses exceeding \$100 Million over the last decade
- Large banks recognize the importance / magnitude of op risk:
 - Based on recent Basle survey, on average they hold 15% of their capital for Op Risk.
 - Per their Annual Reports, Deutsche Bank and JPM are holding €2.5B and \$6.8B for operational risk.

Rationale Banks Cite for Quantifying OpRisk

- Operational failures negatively impact profitability
 - Banks that measure and manage operational risk can reduce earnings volatility
 - Banks that measure and manage operational risk can reduce likelihood of an operational event becoming a “capital event”
- Businesses are more complex, changing rapidly, operationally intensive, and technology reliant
 - Banks that measure and manage operational risk are likely to be less susceptible to systemic problems
- Customers and shareholders demand operational sophistication, speed, and flawless execution
- Risk modeling that omits (or arbitrarily sets) capital for operational risk can distort decision making and performance evaluation

Rationale Banks Cite for Quantifying OpRisk

- Allows banks to identify source of operational losses
 - Perhaps surprising, many banks do not routinely track such losses
 - “Causal” factor analysis helps manage these risks
- Allows banks to identify operational loss outcomes that they have exposure to, but have yet to experience.
 - example: bad cluster of high frequency, low impact events
- Provides a framework for modeling extreme events.
 - “Scenario Analyses” of low frequency, high impact events
 - example: business interruption
- Help incorporate the quantification of “risk reduction” into the decision making process
 - examples: technology, growth, insurance products

Goals of Bank Supervisors

- Revise international capital accord to incorporate greater risk sensitivity and capture significant risks, including op risk
- Allocate capital according to a risk-focused approach to the quantification of operational risk
- Provide incentives for banks to measure and manage operational risks
 - Promote sound internal policies / controls / procedures
 - Motivate investment in operational risk infrastructure to reduce operational risk
- Ensure appropriate consideration of stress testing / systemic risk
 - Consideration of systemic implications of operational risk decisions made by individual firms

Timetable for Basle II

- Proposed U.S. Regulatory Text and Supervisory Guidance – 2003Q2/Q3
- Release of Basle Consultative Paper 3 – 2003Q2
- Basle Consultative Paper 3 formal consultation – Summer / Fall 2003
- Final Accord – 2003Q4
- Parallel running of new and existing Accords – 2006
- Implementation – End 2006

Basle II Operational Risk Framework

- Minimum Regulatory Capital (Pillar 1)
 - Framework for calculating op risk capital charge
 - Utilizes spectrum of approaches of increasing complexity
- Sound Practices (Pillar 2)
 - Basle issued Sound Practices Paper February 2003
- Disclosure (Pillar 3)
 - Market Discipline
 - Expected to be strong motivator

Basle II: Current Op Risk Proposal

- Alternative approaches provided to accommodate different levels of bank sophistication:

Basic Indicator Approach	Standardized Approach	Advanced Measurement Approaches (AMA)
Supervisor Specified Parameters	Supervisor Specified Parameters	Bank Defined Parameters
Bank-wide Measure	Business Line Based	Supervisor Set Qualitative / Quantitative Stds
Exposure Indicator * Alpha	Exposure Indicator * Beta	Significant Flexibility
Exposure Indicator = Gross Income	Exposure Indicator = Gross Income	Examples:
Alpha = 15%	Betas = 12 - 18%	Loss Distribution Approach Scorecard Approach

Increasing Complexity Increasing Risk Sensitivity



How Have Banks Historically Calculated OpRisk Capital

- How much capital to hold for OpRisk?
 - The “residual method”
 - How much are we holding now?
 - How much does our credit risk model say we need?
 - How much does our market risk model say we need?
 - What is left over?
 - Allocate that “residual” for OpRisk
- How much capital should be allocated to each business line?
 - Depends on:
 - Scale: e.g., higher non-interest expense, more capital
 - Controls: e.g., poor audit score, more capital
 - Often, “business risk” is incorporated
 - earnings volatility, fixed costs, profit margin
- Are these methodologies risk-sensitive?
 - Correlation with true OpRisk exposure is unknown

The AMA - why it makes sense

- Risk Sensitive:
 - Capital reflects operational risks for size and scope of bank's activities
 - Banks with low risk mix of business or less activity need less capital
 - Banks with better control environments require less capital
 - Banks with well developed risk mitigation hold less capital
- Flexible:
 - Banks choose supportable methodologies reflective of their business
 - Capital allocation can be integrated into risk assessment and risk indicators systems that many banks are currently using to monitor operational risk
- Transparent to management and markets -- promotes level playing field
- Rewards investment in better control environments:
 - Actions that reduce loss experience also reduce capital
 - Actions that reduce the likelihood or severity of extreme events can reduce capital
 - Actions that mitigate risk can reduce capital

Key Elements of a Basle II AMA

1. Internal Data
 2. External Data
 3. Scenario Analysis
 4. Internal Control and Business Environment Factors
 5. Insurance / Mitigation Techniques
- Flexible, framework that builds on banks' internal methodologies and allows for evolution of practice over time
 - Qualitative and quantitative supervisory criteria
 - Similar approach as Basle Market Risk Amendment
 - Key elements can be combined in different ways to quantify the bank's OpRisk exposure
 - Rely on supervisory validation and benchmarking across institutions

Operational Loss Data

Data collection differs across banks:

- The more detail the better, but detail comes at a \$ cost
- What kind of tracking system is needed? Manual? Automated? Training?
- Definition? Date information? Insurance payoffs? Other recoveries?
- What is the appropriate \$ threshold to capture in database? Near misses?
- How should operational events “across business lines” be handled?
- How should internal data be supplemented with external data?

[1] Event #	[2] Event Code (1)	[3] Event Code (1)	[4] Date	[5] Cost Center	[6] Business Line	[7] Loss	[8] Recoveries	[9] Insurance	[10] Event Description
1	IF	12	960116	10003	RB	19057.25	0.00	19057.25	
2	EF	31	960116	20003	RB	40905.04	0.00	40905.04	
3	SY	22	960116	33890	CF	10194.55	3433.00	10194.55	
4	SY	11	960119	45359	CF	52831.68	0.00	52831.68	
5	PD	11	960120	11101	CB	36558.11	0.00	36558.11	
6	IF	32	960120	10003	PS	620537.37	0.00	620537.37	
7	IF	22	960122	20203	AS	10181.69	0.00	10181.69	
8	EF	31	960122	19767	AS	24783.17	13556.00	24783.17	
9	EE	17	960122	19332	TS	11963.49	0.00	11963.49	
10	EE	27	960122	18897	AS	20086.56	0.00	20086.56	
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2701	UA	8	960146	10003	RB	14451.49	0.00	14451.49	
2702	UA	3	960148	10003	RB	11010.46	0.00	11010.46	
2703	WS	17	960150	33890	CF	24681.18	0.00	24681.18	
2704	SF	26	960152	23223	AM	17963.66	16963.66	17963.66	

Quantification Methodologies

- Alternative techniques are available
 - Chosen technique must include key elements of AMA: internal data, external data, scenario analysis, and internal control and business environment factors
 - Example 1: Loss Distribution Approach
 - Models frequency distribution and severity distribution to formulate an operational loss distribution
 - Challenge to understand appropriate modeling of the “tail” of the severity distribution
 - Example 2: Scorecard Approach
 - Models required capital at the corporate level
 - Allocates capital pool to business lines based on scorecard
 - Other credible methodologies will be acceptable
 - AMA does NOT preclude alternatives

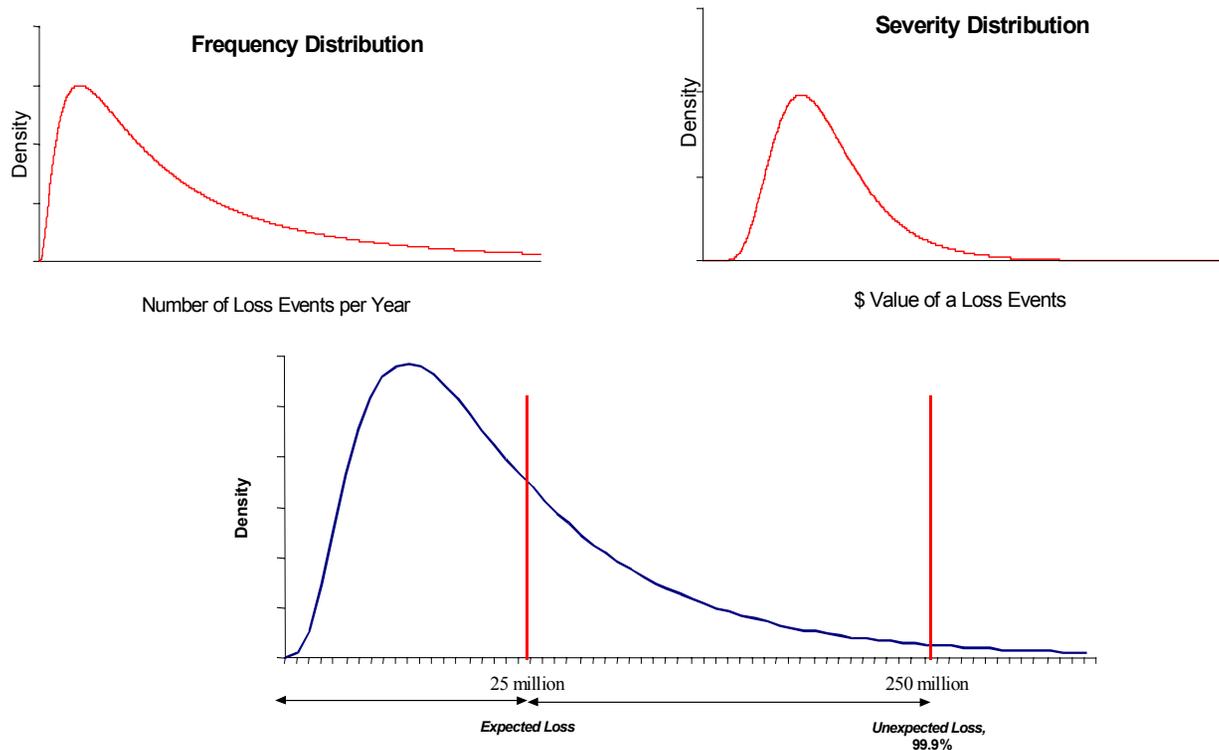
Quantification Methodologies - LDA

- The Loss Distribution Approach:
 - Standard statistical techniques are available
 - which techniques are most appropriate?
 - what are appropriate for modeling the “tail” of the distribution?
- Data Quality is Important
 - Incorporating high-severity events
 - External data?
 - Scenario analysis?
- Incorporating Risk Mitigation
 - Insurance coverage can be incorporated into methodology
 - uses information about deductibles / limits on “event policies”
 - still have to assess translation into credit / legal risk
 - Provides framework to assess appropriateness of coverage

Overview of LDA

Generally, estimation of an operational loss distribution involves 3 steps:

1. Estimating a frequency distribution
2. Estimating a severity distribution
3. Running a statistical simulation to produce a loss distribution



Total Operational Loss over a 1 year time horizon

Internal Control and Business Environment Factors

Qualitative Risk Assessments

- Developing qualitative operational risk assessments
 - Tailored to business line, and are designed to be “real time” and/or “forward-looking”
 - “Scorecard”
 - business unit asked to answer series of questions regarding OpRisk
 - examples:
 - What is the number of sensitive positions filled by temps?
 - What is the ratio of supervisors to staff?
 - Does your business unit have confidential client information?
- However, are these scorecards correlated with true OpRisk exposure?

Internal Control and Business Environment Factors

Key Risk Indicators

- Developing systems that track risk indicators
 - “Real Time” indicators
 - Usually tailored to business line
 - examples:
 - employee turnover
 - number of open employee positions
 - transaction volume
 - average transaction size
- However, are these indicators correlated with OpRisk exposure?
- Quantitative Analysis can help assess relevancy of KRIs
 - which are drivers
 - what are important thresholds

The Role of Insurance Coverage in the AMA

- Banks permitted to recognize risk mitigating impact of insurance
- Supervisory criteria will be specified, including:
 - Minimum solvency standards for insurance provider
 - Minimum termination / non-renewal periods
- Aggregate limit of a 10-25% capital offset for insurance
- Supervisory validation necessary
 - Strong Pillar II component

AMA - Qualitative Criteria

- Supervisory review and approval of OpRisk management process
 - Conceptually sound / implemented with integrity
 - Ability to measure, monitor, and control OpRisk
- “Use Test:” Closely integrated into day-to-day management process
- Active involvement of board and senior management
- Validation process
 - Audit review of OpRisk management and measurement systems

AMA - Loss Data Criteria

- Internal loss data must be comprehensive - capture all material OpRisk losses
 - Map to supervisory established business line and event type matrix
- Internal data must reflect current business activities, technology, and risk management practices
- Any data adjustments (*e.g.*, scaling) or judgmental overrides must be justified and documented
- Internal data must be supplemented when the bank has experienced a limited number of loss events for a particular business line or event type
 - External data
 - Scenario Analysis

AMA - Quantitative Criteria

- Credible estimate of tail of OpRisk loss distribution
 - Low frequency, high severity events must be captured
 - Does not include catastrophic events
- Supervisors will not set required model specifications
 - Banks choose supportable methodologies reflective of their business
- Supervisors will require capital for sum of expected loss (EL) and unexpected loss (UL)
 - Unless bank can demonstrate that EL is captured through reserves, pricing, or expense practices
- Must maintain rigorous procedures for model development and validation
 - Independent validation / Assessment of model output with actual results

AMA - Internal Control Factors

- OpRisk assessments should capture key business environment and internal control factors relevant to OpRisk profile
- Bank idiosyncratic qualitative factors can be applied in a number of ways:
 - Adjustments to empirical estimates of OpRisk
 - Refinement of scenario analysis
 - Development of Scorecard Approaches
- Adjustments related to self assessments and internal controls require justification / documentation

Industry Implementation of AMA

- A number of institutions are making significant progress in developing and implementing an AMA. And numerous organizations are moving in this direction.
- The most advanced programs consist of:
 - Corporate OR Governance Structure
 - Corporate OR risk management function
 - Firm-wide policies & procedures
 - Business line involvement
 - Firm-wide data collection framework
 - Consistent, comprehensive firm-wide definitions of OR
 - Technology platform to collect data (web-based, GL, Hybrids)
 - Data retrieval complete above minimum loss thresholds
 - Quantification of firm-wide and BL economic capital
 - Assessment of economic capital
 - Statistical techniques using internal and external data
 - May also use scenario analyses and expert opinion
 - Qualitative factors / adjustments based on scorecards, self- assessments, audit scores
 - Incorporation of insurance
 - Allocation of economic capital to business lines to create incentives for better OpRisk management and controls

Supervisory Implementation Challenges

- Banks have significant concerns about consistent treatment by supervisors
- Supervisors will have to wrestle with assessing adequacy of:
 1. Bank's *Internal* Operational Loss Database
 2. Bank's *Internal* Quantification Techniques
 3. Bank's *Internal* Monitoring of OpRisk Business Environment and Control Factors
- “Across industry” perspective will be vital for successful implementation

Basle Sound Practices Paper

- Distinct from Capital Accord
- Broadly applicable to all banks, commensurate with size and complexity
- Based on extensive industry consultation
- Baseline of sound OR management and control principles
 - Developing appropriate risk management environment
 - Risk identification, assessment, monitoring, and mitigation/control
- Caveat:
 - Not binding

Discussion of Sound Practices

- Principle 1: Board of Directors
 - Board of directors should:
 - Be aware of material operational risks
 - Approve and review banks' risk management framework
- Principle 2: Internal Audit
 - Internal audit should:
 - Be operationally independent, appropriately trained, and competent
 - Not be directly responsible for operational risk management
- Principle 3: Senior Management
 - Senior management should:
 - Have day-to-day responsibility for implementing the bank's operational risk management framework
 - Ensure staff have adequate training and experience
 - Foster effective communication re: operational risk management

Discussion of Sound Practices (cont.)

- Principle 4: Risk Identification and Assessment
 - Banks should identify and assess major risks in existing and new products activities, processes, and systems. Tools include:
 - Risk Self-Assessments
 - Key Risk Indicators
 - Scorecards
- Principle 5: Risk Monitoring
 - Banks should regularly monitor operational risk and report pertinent information to senior management and board of directors
- Principle 6: Risk Mitigation & Control
 - Banks should have policies and procedures in place to mitigate or control material operational risks.
 - Strong control culture is important
 - Pay close attention to new activities and markets
 - Insurance is not a substitute for controls
 - Disaster recovery and business continuity plans are essential
 - Risks of outsourcing and vendor relationships should be understood & managed

Discussion of Sound Practices (cont.)

- Principle 7: Business Continuity
 - Banks should have in place disaster recovery and business continuity plans that take into account plausible business disruption scenarios.
- Principles 8-9: Role of Supervisors
 - Supervisors should:
 - Require banks to have a framework for identifying, assessing, monitoring and controlling operational risks
 - Independently review these operational risk management frameworks
 - Encourage bank development and innovation
- Principle 10: Disclosure
 - Banks should make sufficient disclosure to allow the market to assess their operational risk management framework.

Summary

- Operational risk is significant, banks recognize this and are increasingly seen allocating capital to this risk
- Both banks and supervisors have sound and well reasoned motives for pursuing the goal of quantifying operational risk
- Basle II provides a flexible spectrum and framework for the quantification of operational risk, particularly within the AMA
- The industry is making progress in developing and implementing the AMA but significant work remains
- The flexibility in the AMA poses supervisory challenges that will need to be addressed
- Basle Sound Practices Paper provides guidance relevant to all institutions' management of operational risk