

Initiating Operational Risk Management

November 3, 2003

<http://www.rcg.ch>

Table of Contents

➤ Part I: Overview of Op Risk	3
– Motivating Op Risk Management	4
– Defining Op Risk	7
– Basel II approach towards Op Risk capitalization	8
➤ Part II: Initiating an Op Risk Management Program	15
– Philosophy and Framework	16
– Risk Identification	18
– Risk Measurement	20
– Risk Monitoring	23
– Risk Control	24
– Take off	26

Part I: Overview of Op Risk

Op Risk Management
November 3, 2003

Deliver "better, faster & cheaper" is the Major Challenge to Operational Risk Management

- Client expectations for operational sophistication, speed and accuracy
- Increasing complexity of products and support requirements
- Increasing dependency on technology
 - Use of more highly automated technology
 - Growth of e-commerce
- Emergence of banks as very large-volume service providers
- Increased prevalence of outsourcing
- Greater use of financing techniques that reduce credit and market risk, but that create increased operational risk
 - Derivatives
 - Netting Agreements

Improving Operational Risk Management Requires a New Model

Old Model

- Op Risk considered a by-product of market / credit risk
- Accountability for Op Risk diffused across front / middle / back office
- No understanding of Op loss levels
- Op Risk not systematically measured at business or firm-wide level
- No cross business / industry performance measures available

New Model

- Op Risk is a primary risk discipline with similar tools / approaches as other risk
- Transparency and accountability established for Op Risk
- Op losses measured and analyzed
- Op Risk systematically measured with capital assigned to each risk
- Benchmarking performance both internally and externally

"Motivating" Op Risk Management: The ABC of Operational Losses

- The complexities of operational risk make it hard to measure, but the potential for devastating losses makes it necessary to try
 - **A**llied Irish Banks (US\$ 691 mio)
 - **B**arings (US\$ 1.4 bn), Bank of Credit and Commerce (US\$ 10 - 17 bn)
 - **C**rédit Lyonnais (US\$ 20 - 30 bn); Citigroup and other N.Y. investment banks (US\$ 1.4 bn)
 - **D**eutsche Bank - Morgan Grenfell (£ 400 mio)
 - **E**nron, Earthquake in Japan (January 1995)
 - ...
 - September 11, 2001

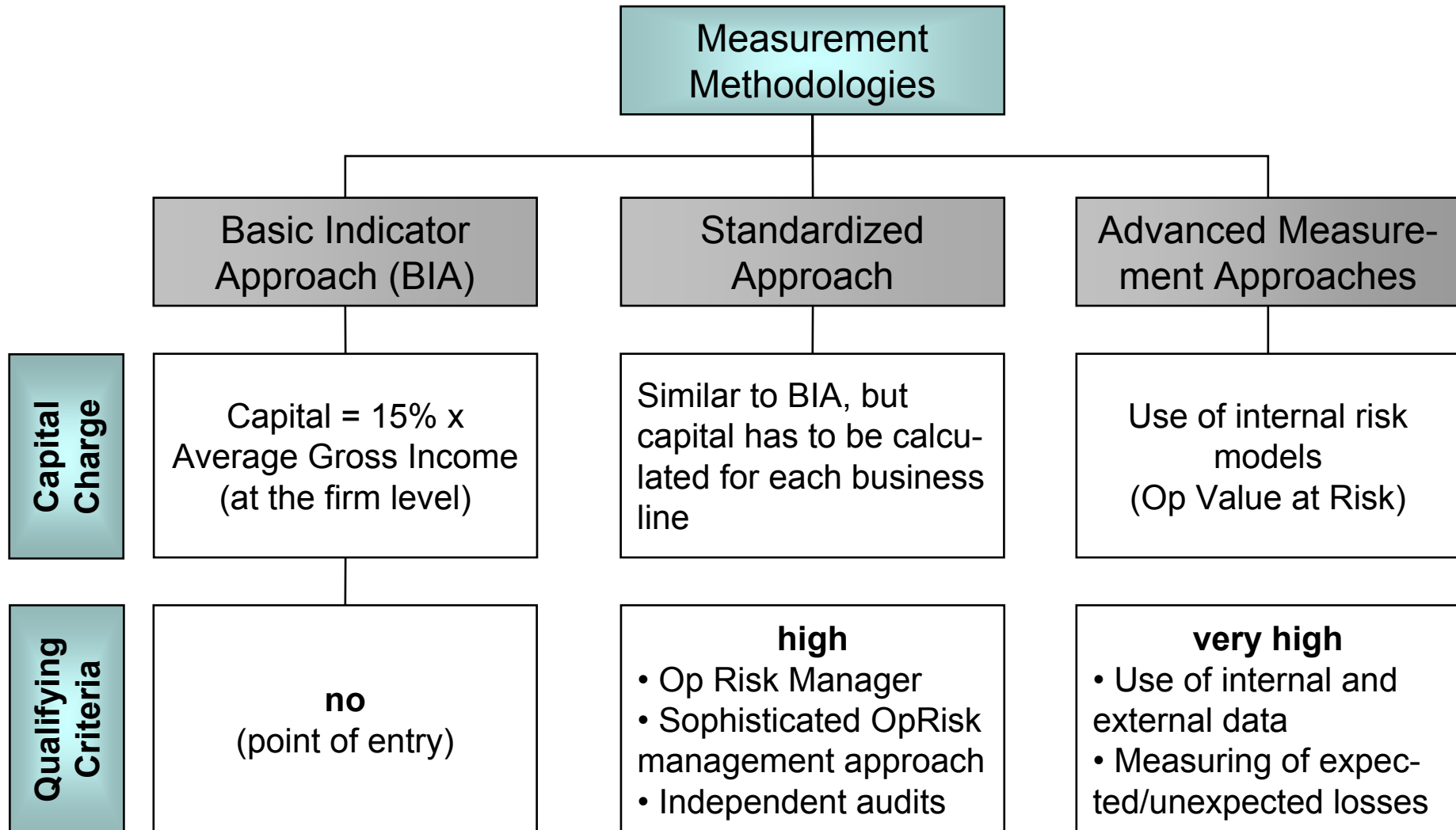
- Hopefully, we don't need a large OpRisk event as a wakeup call.

Definition of Operational Risk

- "The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events."
- This definition includes legal risk, but excludes strategic and reputational risk
- Definition is based on the underlying causes of operational risk.

Source: Basel Committee: The New Basel Capital Accord, April 2003

Calculating Op Risk Capital under Basel II



Basic Indicator Approach

$$\text{Capital} = \alpha \times \text{Gross Income}$$

- $\alpha = 15\%$ (provisional)
- **Gross income**
 - defined as net interest income plus net non-interest income.
 - measured as average annual level of gross income over the past three years
- No specific criteria for use of the Basic Indicator Approach are set out in the rules. Nevertheless, banks using this approach are encouraged to comply with the Committee's guidance on *Sound Practices for the Management and Supervision of Operational Risk*
- For smaller banks with a simple range of business activities

Standardized Approach

- The total capital charge is calculated as the simple summation of the regulatory capital charges across each of the business lines.

$$Capital = \sum_{i=1}^8 \beta_i \times Gross\ Income_i$$

- Gross Income = average annual level of gross income over the past three years, for each of the eight business lines

Business Lines	Beta factors (provisional)
Corporate finance (β_1)	18%
Trading and sales (β_2)	18%
Retail banking (β_3)	12%
Commercial banking (β_4)	15%
Payment and settlement (β_5)	18%
Agency services (β_6)	15%
Asset management (β_7)	12%
Retail brokerage (β_8)	12%

Advanced Measurement Approaches

- Under the AMA, banks will be allowed to use the output of their **internal operational risk measurement systems**, subject to qualitative and quantitative standards.
- The risk measurement system must be based on internal loss data that can be mapped into the Committee-specified **business lines** and **event types**.
- Given the continuing evolution of analytical approaches for operational risk, the Basel Committee is not specifying the approach or distributional assumptions used to generate the operational risk measure for regulatory capital purposes.
- However, a bank must be able to demonstrate that its approach **captures potentially severe tail loss events**.

AMA: Internal Measurement Approaches

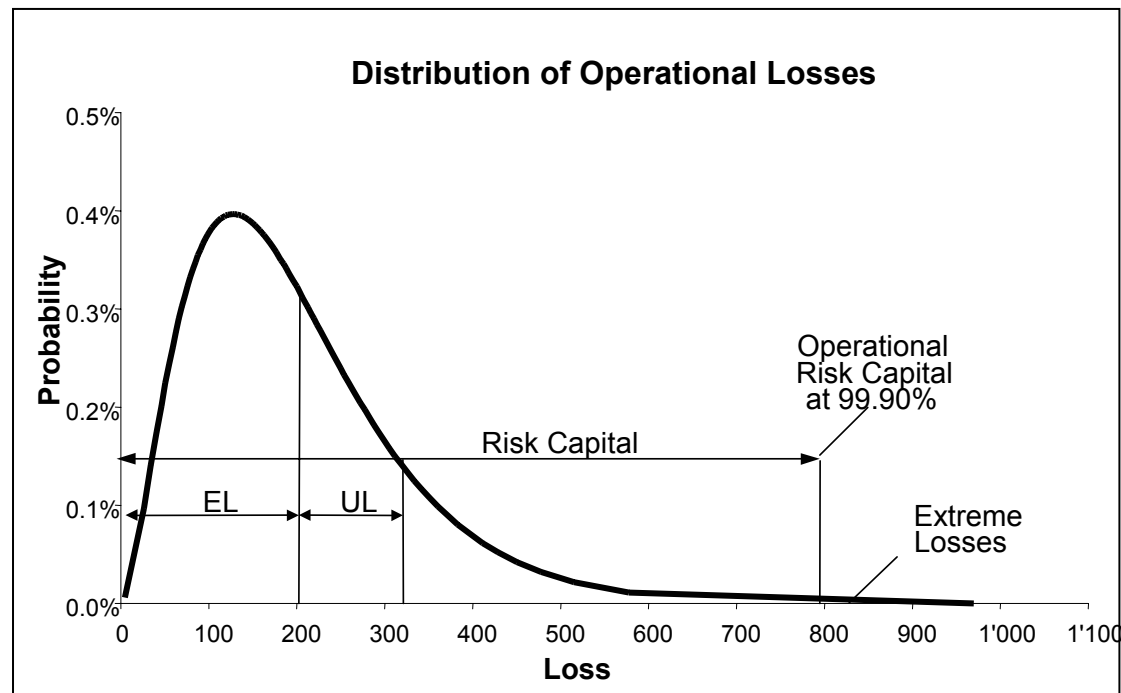
- Banks generate estimates of operational risk capital based on measures of **expected** operational risk **losses**. That is, the approach assumes a fixed and stable relationship between expected losses (the mean of the loss distribution) and unexpected losses (the tail of the loss distribution).

- Parameters:
 - EL = Expected Loss of business line i and event type j
 - EI = Exposure Indicator
 - PE = Probability of Event
 - LGE = Loss Given Event
 - CM = Capital Multiplier

- $Capital_{i,j} = EL_{i,j} \times CM_{i,j} = EI \times PE \times LGE \times CM_{i,j}$

AMA: Loss Distribution Approaches

- LDA's estimate the shape of the whole loss distribution by means of analytical calculation or Monte Carlo Simulation
- Same parameters as with IMA + recognizing correlation of losses across business lines / risk types
- Difference to Internal Measurement Approach:
 - Capital is assessed directly rather than via an assumption about the capital multiplier



There are specific Advantages and Disadvantages for Each Approach

"Lower" Approaches

- Easier to use
 - work with less data
 - simple formula approaches
- Are conservative as industry factors comprise a security margin
- Lead to lower risk sensitivity and to higher capital costs
- Do not motivate full and ultimate use of risk management opportunities

"Higher Approaches"

- Require high implementation efforts
- Require substantial data management (incomplete/insufficient data may lead to wrong assessment of actual risk situation)
- Lead to more risk sensitivity and lower capital costs
- Enable feedback to improve risk management
- Enable to optimize risk transfer options

Part II: Initiating an Op Risk Management Program

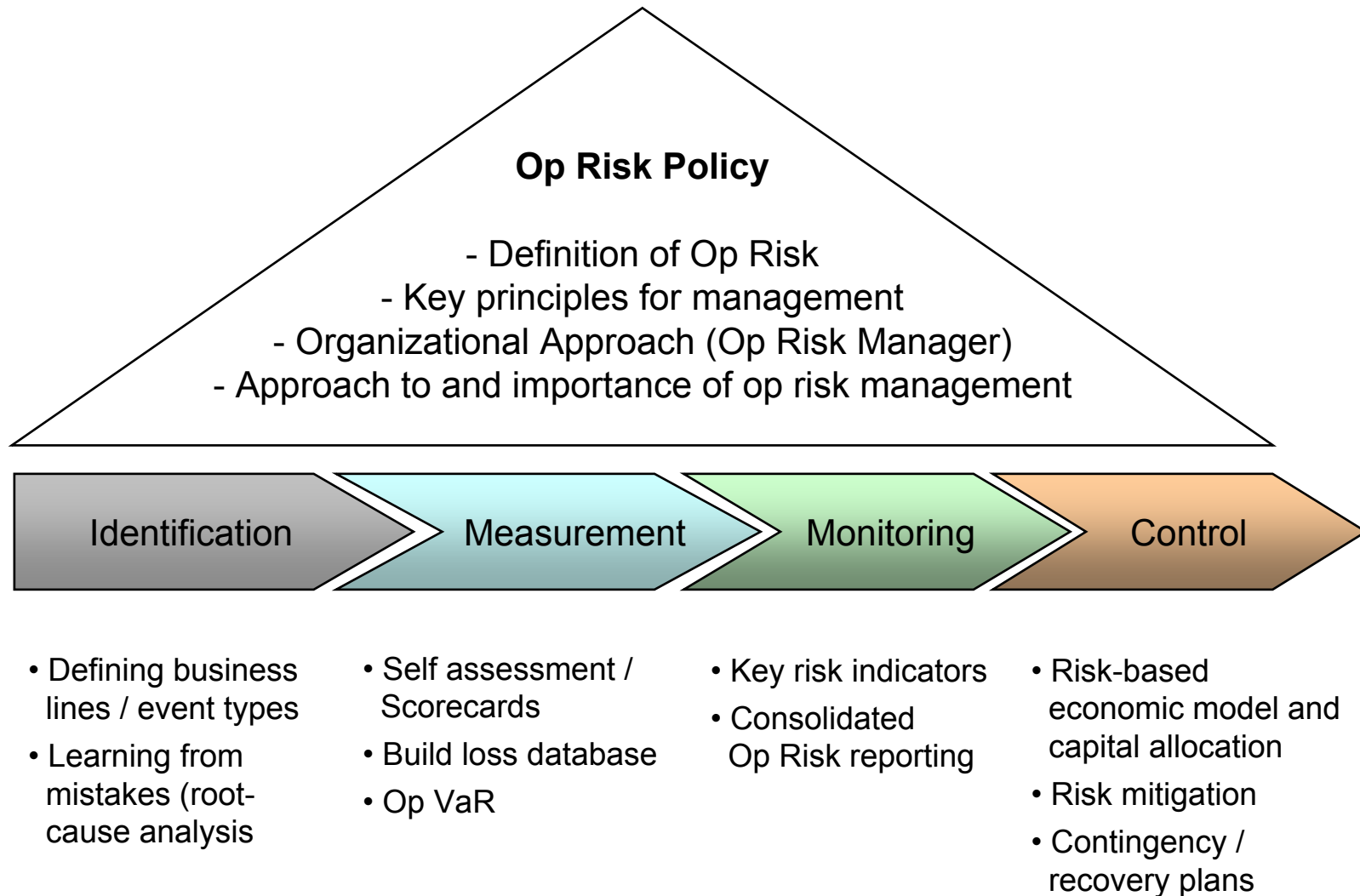
Op Risk Management
November 3, 2003

Our Attitude towards Op Risk Management

- In our view, it is primarily **behavior** – not quantitative modeling – that is important in managing Op Risk:
 - The objective should be to motivate management to **create robust op risk controls and procedures**
 - The current Basel II proposal to capitalize Op Risk has framed this as a quantitative modeling problem – not a management control problem
 - Perhaps an unintended consequence of this is that the message sent by the regulatory community to the industry is that Op Risk is adequately addressed by the computation of a capital figure – as opposed to the creation of controls.

- Devote resources into improving the management of Op Risk, rather than its exact quantification

Op Risk Management Framework



Risk Identification

To get started...

At Bank Level
At Business Unit
At Functional Level



- What and where are our biggest operational risks?
- How could our income statement be affected by those biggest operational risks?
- How bad can those events really get?
- How will changes to our business strategy and control environment affect those hits?
- How do our potential hits compare internally / externally

Risk Identification

Business Line / Event Types

Business Unit	Business Lines	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							
	Trading & Sales							
Banking	Retail Banking							
	Commercial Banking							
	Payment and Settlement							
	Agency Services and Custody							
Others	Asset Management							
	Retail Brokerage							

Activity Examples

- Miscommunication
- Accounting error
- Delivery failure
- Collateral management failure
- Disclaimers missing
- Legal documents missing / incomplete
- Outsourcing

Risk Measurement: Self Assessment - Scorecards (1/2)

- **Self assessment** is a process whereby business lines identify and evaluate the risks incurred, the level of control the areas have over these risks, and action points for improvement
 - **Step 1:** Define set of **risk events** by Business Line
 - **Step 2:** Assess **frequency** and **severity** of risk event, based on loss database and judgment
 - **Step 3:** Assess the **level of control** the Business Line has over these risk events
 - **Step 4:** Identify control **gaps** and necessary **action** items

- **Procedure**
 - Choose most suitable approach (checklists / workshops)
 - perform frequently - at least semi-annually
 - concentrate on high impact / low frequency events
 - verify results by Op Risk Manager
 - involve Internal Audit in validation of self assessment process
 - Do not use results against business line managers!

Risk Measurement: Self Assessment - Scorecards (2/2)

- Reports of business lines to be aggregated by Op Risk Management (e.g. "Top-10 risk list")
- Use heat-maps (color-coded reports) to highlight overall "score" of control effectiveness

BL: Retail Risk Event	Probability of Event	Loss Given Event	Control of Risk			Net Risk / Action Required
			High	Medium	Low	
Miscommunication	High	Low		X		Yellow
Accounting error	Low	Low	X			Green
Delivery Failure	High	Medium		X		Yellow
Outsourcing	Low	High			X	Red
...						
Total	Low	Medium				Yellow

Risk Measurement: Designing a Loss Database (Example)

Organization	Loss Amount	Description	Risk class	Risk Event	Contributory Factors	Business Unit	Lessons learned
Allied Irish Banks	\$ 691 mio	Rogue trader creates fictitious options to hide his losses, which give the impression that his real positions were hedged	People	Fraud	Inexperience of back-office staff Failure of back office to obtain consistently transaction confirmations Ability of trader to manipulate the VAR figures used to monitor his trading activities	Currency trading	Clear dividing line between trading, risk management and bookkeeping
Bankers Trust	\$ 100 mio	Major clients (eg Procter & Gamble) claims that BT has unfairly exploited their comparative lack of sophistication in handling complex derivative products	Inadequate internal processes	Product	Systems of performance measurement biased towards monetary incentives Poor stakeholder management	Derivatives	No performance pressure that encourages participation in deals that ultimately backfire Clients are stakeholders, too
Citigroup and other investment banks based in New York	\$ 1'000 mio	Regulators accuse various banks to be culpable for misleading investors with overly optimistic research on investment-banking clients	Inadequate internal processes	Business Practices	Compensation package of stock analysts tied to the acquisition of investment banking business from the researched corporates	Investment Banking (Trading & Sales)	Establish "Chinese walls" between stock analysts and investment bankers

Risk Monitoring: Key Risk Indicators

- Risk indicators are measures that attempt to identify potential losses before they happen and **raise red flags** if they go outside an established range.
- Indicators are ordinarily associated with the monitoring of operational efficiency and can be tracked in spreadsheets or commonly used data management software products

Examples (in line with Op Risk definition)

- Internal processes
 - Failed trades, FX settlement errors, number of customer complaints, transaction turnover
- People
 - Employee turnover, employee sick days, employee errors, aggregate grading of all performance reviews, above-average returns
- Systems
 - Systems downtime, data throughput, failed background checks
- External events
 - Amount of lawsuits by number and/or dollar value, warnings from regulatory agencies, customer-initiated legal actions

Risk Control (1/2): Assessing Risk Mitigating Actions

Frequency	high	Reduce <ul style="list-style-type: none">- understandable- predictable- controllable	Hardly relevant <ul style="list-style-type: none">- otherwise bank would already be out of business
	low	Accept <ul style="list-style-type: none">- does not matter much	Avoid <ul style="list-style-type: none">- can put a bank out of business or damage its reputation- difficult to predict
		low	high

Loss

Risk Control (2/2)

- In spite of challenges, **risk capital** should be allocated to each business based on its complexity, perceived risk and control quality
 - Why? Allocating risk capital to business lines always acts as a disciplinary factor and prevents excessive risk taking.
 - Computing and allocating Op Risk capital as an incentive to motivate management of these risks

- Implement **contingency and business continuity plans** to ensure the ability to operate as going concerns
 - Take different types of **plausible scenarios** into account to which the bank may be vulnerable
 - Particular attention should be paid to the ability to restore electronic or physical records that are necessary for business resumption
 - These **plans** should be **tested** periodically to ensure the bank will be able to execute them in the unlikely event of a severe business disruption

4 Stages to "Take off" Op Risk Management

