Implementing Advanced Measurement Approach (AMA) for Operational Risk Management

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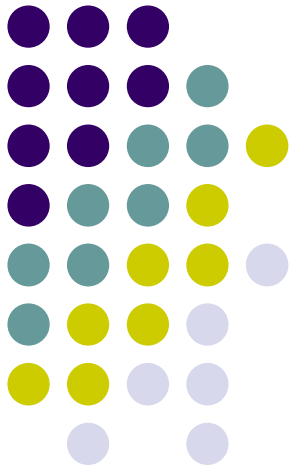

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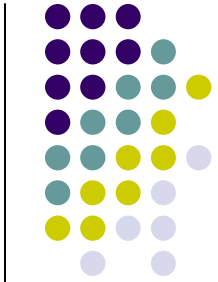
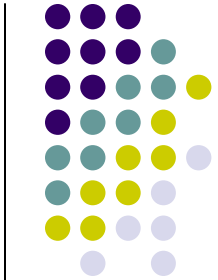
What is PRMIA?



- The Professional Risk Managers' International Association (PRMIA) is a non-profit professional association of more than 69,983 members in 198 countries and is represented globally by 60 chapters in major cities around the world,
- Established in 2002 by a volunteer group of risk professionals with a mission to provide a free and open forum for promotion of sound risk management standards and practices globally

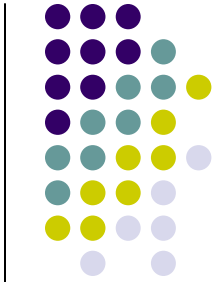
What is PRMIA?

The Objectives



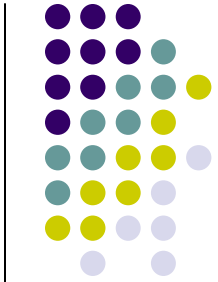
- To be a leader of industry opinion and a proponent for the risk management profession
- Drive the integration of practice and theory and certify the credentials of professional risk managers
- Connect practitioners, researchers, students and others interested in the field of risk management
- Be global in focus, promoting cross-cultural ethical standards, serving emerging as well as more developed markets
- You can join PRMIA as a member or register for future events at www.prmia.org

Disclaimer



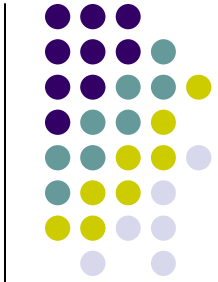
All comments presented here represent my personal views and not necessarily of my current or previous employers or that of PRMIA's

Agenda



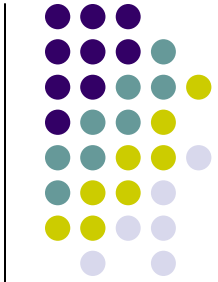
- Implementing AMA
  - Value Proposition
  - Building blocks
  - Measurement, Monitoring and Reporting
  - Use Test

Value Proposition



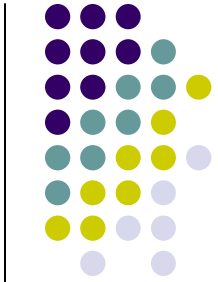
- Build a case for Senior Management and Businesses to prove value by focusing on the benefits
  - Tangible (Savings in Capital)
  - Intangible (Risk-aware Culture, Market Positioning and Strategic advantage)
- AMA Supports and Strengthens the good Risk Management practices by providing tools and measures and by enhancing transparency
- At the end, good risk management is about reliable processes, effective controls and above all good people

Value Proposition



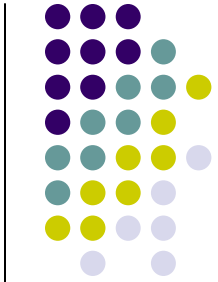
- Strengthening Risk framework
  - Provides tools for Risk assessment and quantification – relationship between Risks, Losses, Controls
  - Development of Risk appetite – Quantify potential losses and determine tolerance levels
  - Incentivizes improvements in controls and process environment -
- Informed Decision making
  - What are main risks; which process are prone; how effective are the controls
  - Realized (ILD) and potential costs (SA) of these risks
  - Enabling decisions on investment in Processes and controls and monitoring of effects

Value Proposition



- Savings in Regulatory Capital
  - BIA and TSA tied to Revenues. For TSA Banks, Revenue Mix is important e.g. Beta Factors for Retail Banking: 12% vs. Trading and Sales: 18%
  - AMA is a Risk Sensitive approach – Fewer Losses and Risk Incidents and improvements in Control environment may translate to lower capital charge
  - Estimate Capital Saving
    - Compare the Capital/ Revenues ratio (BIA: 15%, TSA: effective average) against Bench-mark. LDCE - Median %age of : 10.56%, Inter-quartile Range: 9.5%-13.5%
    - Peer analysis – reviewing risk disclosures in Financial Statements for comparable AMA banks

Getting started

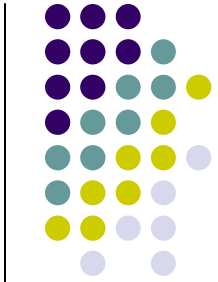


- "Keep the END in Mind"
- Develop Internal Risk Categories that are more intuitive and align with the processes of the organization (Common Risk Language)
  - Map Losses, Risks, Scenarios, KRIs to processes and controls to enable causal analysis
  - Link Internal categories with Basel categories. OpVaR calc will aligned with Basel Categories, Internal categories will provide better transparency into exposures
  - If possible use an integrated application that incorporates all the required elements and makes it easy to stress one against the other
- Desirable qualities of the framework
  - Transparency, Flexibility, Alignment

Building Blocks of AMA Framework

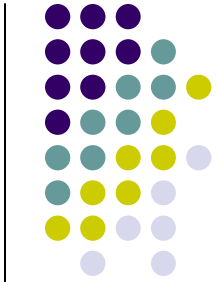
- Internal Loss Data
  - Build frequency and severity distributions for most of the Risk Types
- External Loss data
  - Estimation of Tail events in the quantification for Severity based on a predetermined criteria also for Feedback into Scenario Analysis
- Scenario Analysis
  - Plug for Risk Types with fewer Loss data points and or for modeling seveirty for extreme events
- Business Environment and Control Factors
  - Based on KRIs, Audit Scores and operating environment generate qualitative adjustments to OpVaR

Internal Loss Data



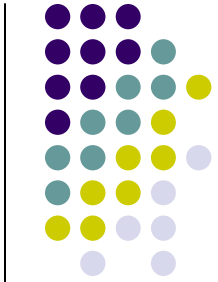
- Clarify concepts around Risks, Losses, Near misses e.g. under what conditions is a revenue reversal considered as OpLoss
- Provide guidelines on reportable losses
  - Type of Losses and specific criteria
  - Treatment of incidents that straddle across businesses and geographies
  - Loss thresholds for escalation and that for use in quantification model
  - Gains vs. Losses
- Create internal risk categories and map
- Opt for an integrated application that incorporates all elements at one place

Scenario Analysis



- Systematic way of collecting expert opinions on the estimates of potential losses
- Develop list of applicable scenarios using ILD/ ELD
- Map each Scenario to Internal and Basel Loss categories and check for sufficient coverage
- For each scenario identify the relevant functions (Front office, Operations, Finance, IT, Legal etc) having sufficient visibility into and ownerships around into the potential losses
- Collect inputs from each function independently on the estimated frequency against distribution of Losses using online questionnaire

Scenario Analysis



Risk Scenario	Number of Instances in a year for a Loss Range				Max Loss Amount
	$10k-$100k	$100k-$1M	$1M-$10M	>$10M	
Booking errors resulting in hedging errors	12	3	3	0.2	$20M

- The Risk of upward or downward bias:
  - Average out the inputs after striking extreme values or
  - Apply Delphi Method to arrive at consensus by letting the assessors revise their estimates in group discussions, iterating till consensus in inputs is achieved

External Loss Data

- Collected from Publicly available information or subscription to ELD database provided by vendors
- Ability to map the data and upload in the internal application for comparison with the other elements
- To meet the Modeling requirements:
  - Objective criteria to pick the losses relevant to the organization
  - Apply weight to loss amounts based on a combination of financial information

Business and Environment Control Factors

- Develop scorecards or Risk ratings based on KRIs, Audit reports, projected growth in business etc
  - Reduction in KRI score => decrease in Risk Rating
  - New Audit points => increase in Risk Rating
  - Increase in Business Complexity and concerns on scalability => increase in Risk rating

- Qualitative adjustment to OpVaR based on %age change in the scores

Risk Measurement using Loss Distribution Approach

- Generate a potential Loss distribution for each Basel Category of Operational Risk by combining through Monte-Carlo Simulation the fitted distributions on Frequency and Severity of Data
  - Loss Frequency: Poisson Distribution
  - Loss Severity: Log-Normal, Generalized Pareto, EVT, Weibull, Negative Binomial etc
- The OR capital will be determined by 99.9x %ile of the distribution adjusted for the BECF (50^{th} percentile would reflect Expected Loss)
- Allocate Total to businesses based on a combination of financial factors and Risk rating determined by BECF

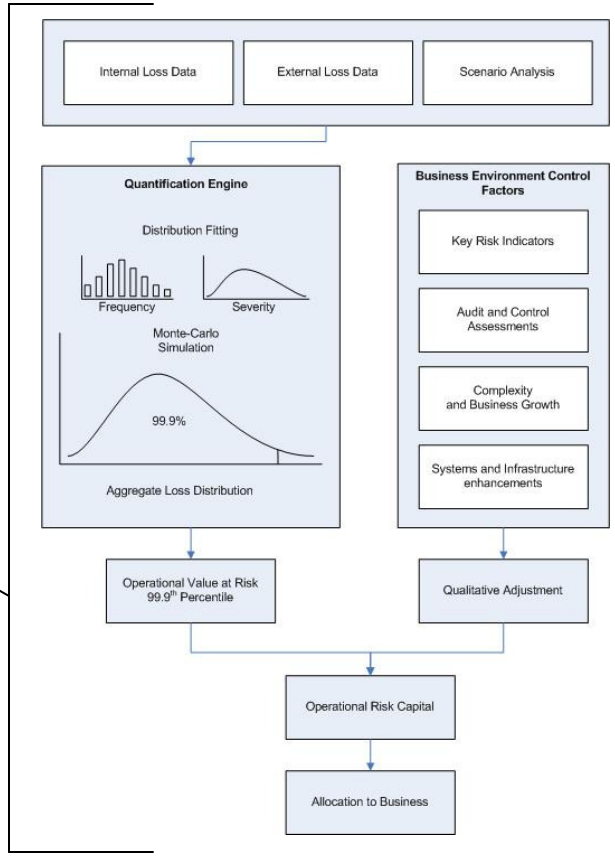
Risk Measurement using Loss Distribution Approach

- Determine the level of granularity
- Use a predefined criteria to select weights for ILD, ELD and Scenario Analysis e.g. Credibility Theory considers number of data points and variance within and between the samples to assign weights
- Use the model to develop Sensitivity Analysis
  - Potential change in OpVaR due to changes in frequency or severity
  - By how much would OpVaR change with a new Loss of $10M, how sensitive is the OpVaR to selection of Loss threshold, or Scenario results or the weights
- Develop tools to monitor back test and stress tests

Risk Measurement using Loss Distribution Approach

99.9x% OpVaR for One year period adjusted for BECF

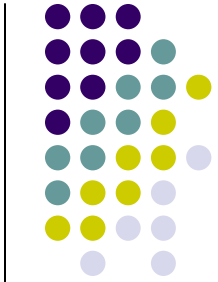
	Basel Loss Event Categories						
Business Units	Execution, Delivery, & Process Management	Business Disruption & Systems Failures	Damage to Physical Assets	Clients, Products, & Business Practice	Employment Practices and Workplace Safety	Internal Fraud	External Fraud
Financial Markets							
Corporate Finance							
Transaction Banking							
Consumer Banking							
.....							



Quantitative and Qualitative Standards for AMA framework

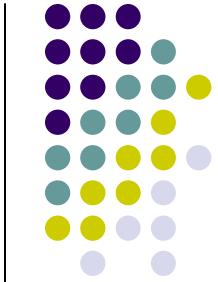
- The framework must be closely integrated into its day to day Risk management, is reviewed and validated and provides benefits to the firm (BIPRU 6.5.6 & 6.5.7)
- Governing body/ Senior Management possesses general/ good understanding of the AMA framework (BIPRU 6.5.9)
- Capital requirement would include Unexpected Loss and Expected Loss unless Expected loss is accurately captured and budgeted (BIPRU 6.5.12)
- Correlation may also be applied between Losses meeting with the defined standards (BIPRU 6.5.13)
- Reduction in Capital may be allowed for recognition of Insurance coverage to the extent of 20% of the total (BIPRU 6.5.27)

Monitoring and Reporting



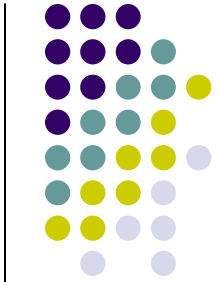
- Build reports that provide a holistic view of operational risk exposures. Risk Themes (Losses realized, Scenario Results), Measure of Risk exposure (VaR, Expected Loss, Sensitivity Analysis) as well as on Performance of controls and improvements in the operating environment (KRIs)
- Leverage the existing Governance Structure.
- ORCs and Business Driven committees provide ideal platform for reporting and discussions though with different focus

Validation



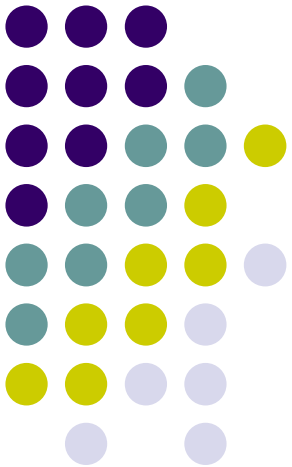
- How do realized Losses pare with Scenario results?
  - too similar could be interpreted as scenarios missing the forward view?
  - too different: Scenarios might be pointing to dark clouds on the horizon?
- Is the variation in realized Loss between Business units justified by the nature and scale of business or the changes in operating environment
- Loss profile: Difference in Number and Quantum of Losses – does it make sense? what are the drivers for the changes?
- How does Scenario analysis results and BECF compare with Loss Data (BIPRU 6.5.23, 6.5.24)
- Changes in OpVar justified based on changes in underlying factors?

Use Test

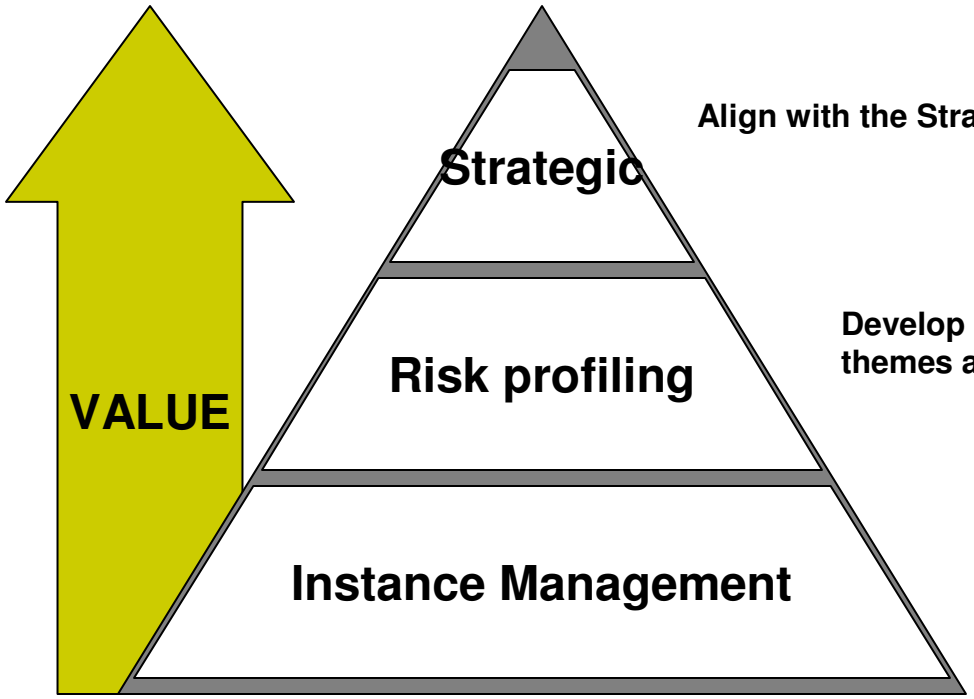


- The ability to demonstrate
  - Data Integrity and Transparency
  - Clarity on escalation and accountabilities
  - Effective governance, Integrated with Business
  - Engagement of Management

Appendices



Value Pyramid

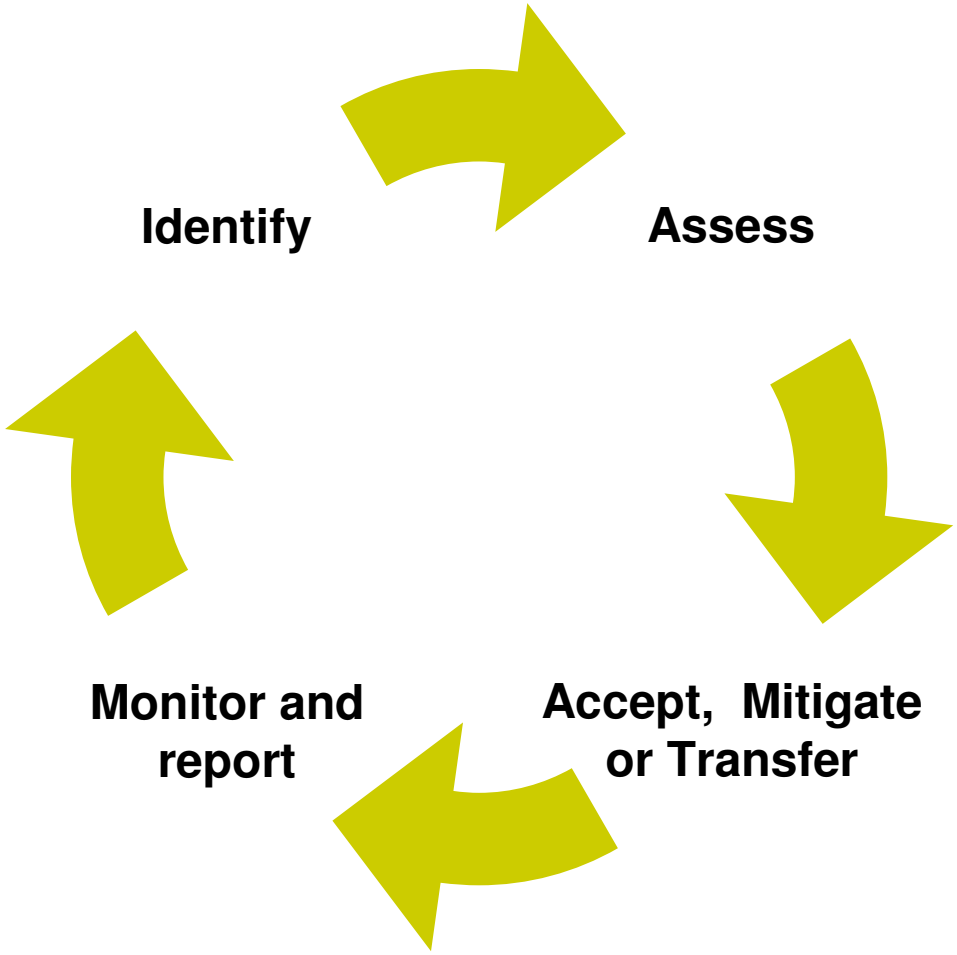


Align with the Strategic objectives of the Management

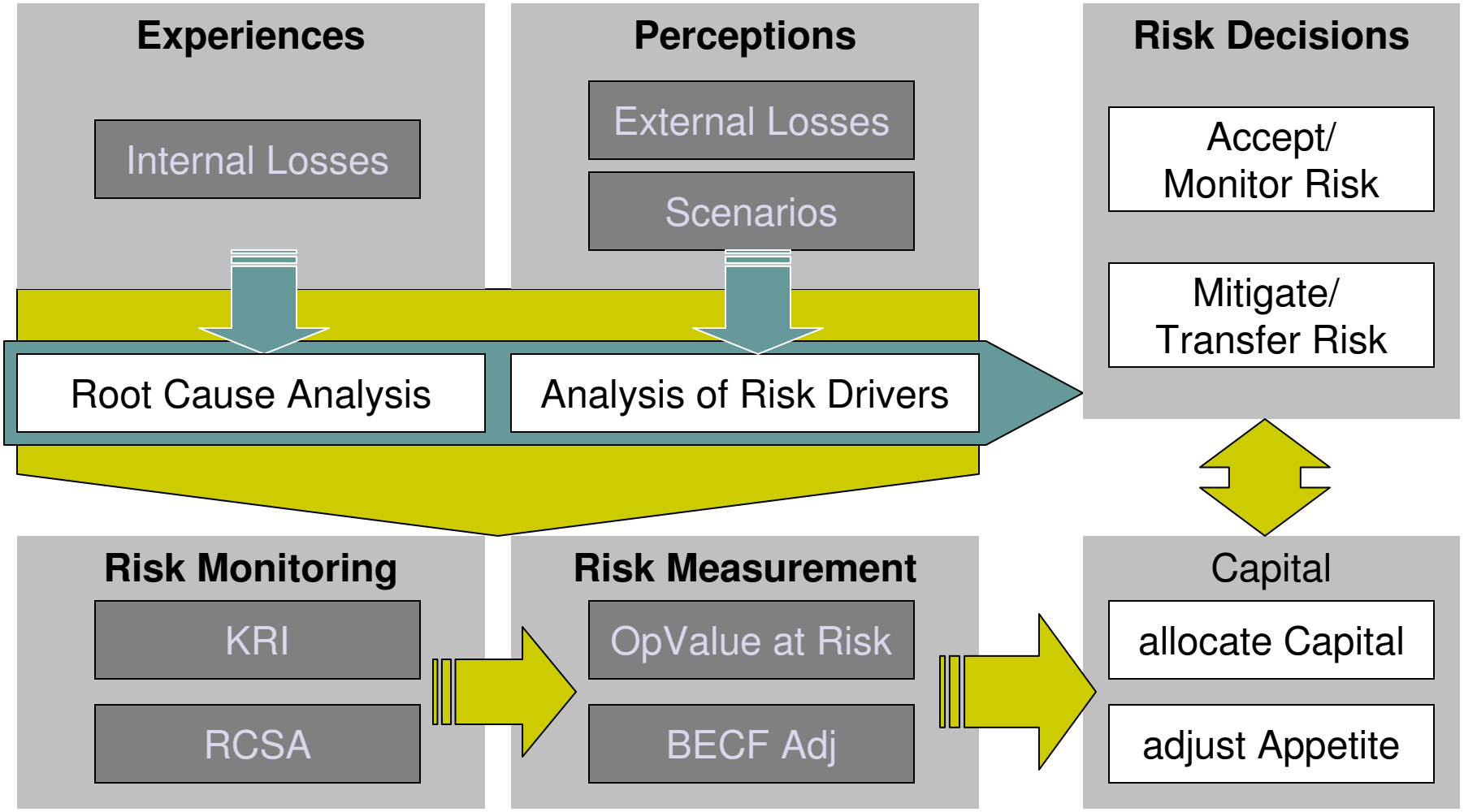
Develop Risk profile of the Bank, reporting on the themes and risk exposures

Analyze root causes, identify potential risks and eliminate gaps

ORM Process Flow



ORM Process Flow under AMA



Validation


Mishedging
Missed Corporate Actions
Execution error
Expected Loss (Scenarios)
Losses realized