Risk Modeling School

Operational Risk Modeling

Course Curriculum & Details
What is in this?

• About Pristine & Operational Risk
• Topics Covered
• Methodology of Teaching
• What to expect at end?
• Who is going to Teach?
• Cost & Duration of the Program
• Contact Details
Pristine is largest authorized trainer for finance certifications in India

**CFA Institute (2010-11)  
Authorized Training provider – CFA**

Pristine is now the authorized training provider for CFA Exam trainings. Pristine is largest training provider for CFA in India with presence across seven major cities.

**GARP (2007-10)  
Authorized Training provider -FRM**

Largest player in India in the area of risk management training. Trained 1000+ students in risk management

**FPSB India (2010-11)  
Authorized Training provider -CFP**

An authorized Education Provider for Chartered Financial Planner Charter.

**PRMIA (2009-10)  
Authorized Training provider – PRM/ APRM**

Sole authorized training for PRM Training in India. Largest player in India in the area of risk management training. Trained 1000+ students in risk management
### Sample Trainings Conducted ...,

<table>
<thead>
<tr>
<th>Institution</th>
<th>Year</th>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank of America</td>
<td>2010</td>
<td>Financial Modeling in Excel</td>
<td>Associates were trained on valuation and mergers and acquisitions.</td>
</tr>
<tr>
<td>Mizuho (2010)</td>
<td></td>
<td>Financial Modeling in Excel</td>
<td>Bankers were using excel models that they could not understand. Conducted Operational Risk in Excel trainings to bridge the gap.</td>
</tr>
<tr>
<td>IIM Calcutta (2010)</td>
<td></td>
<td>Financial Modeling in Excel</td>
<td>Students about to go for internships and join jobs found a gap in their grasp of knowledge of excel for Operational Risk. Conducted training for 75+ students with an average rating of 4.5+.</td>
</tr>
<tr>
<td>FMS Delhi (2010)</td>
<td></td>
<td>Financial Modeling in Excel</td>
<td>Final Year MBA students of Faculty of Management Studies, Delhi University were trained in Operational Risk so as to prepare them better for a job in finance.</td>
</tr>
<tr>
<td>HSBC (2009)</td>
<td></td>
<td>Risk Management</td>
<td>Analysts were trained on advanced quantitative skills and risk modeling.</td>
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*Indicative List*
About Operational Risk

Operational Risk training is an online training program* that can enable you to get a hands on experience** on Operational risk modeling & Capital Implication.

* Delivered Online, available 24 x 7
** The case studies are implemented in Excel
About Operational Risk

Operational Risk training is an online training program that can enable you to get a hands on experience in operational risk modeling.

- Delivered online &
- Available 24 x 7
- Each student gets a secure log-in to access recordings
- No-need to be online at a specific time
- Lessons can be taken repeatedly
About Operational Risk

Operational Risk training is an online training program that can enable you to get a hands on experience in operational risk modeling.

- Best suited for people working/planning career in:
  - Operational Risk Managers
  - Risk Modelers
  - Auditors/Consultants for UAT and selection of OpVaR Modeling software
  - Risk and Capital Management Personnel
About Operational Risk

Operational Risk training is an online training program that can enable you to get a hands on experience in operational risk modeling.

• Practical Excel based understanding of Statistics and Op. Risk Modeling
• Focus on capital implication of Modeling Decisions
• Distr. Fitting (MLE, MME, etc.)
• Understand the concepts from scratch
• Step by step tutorials and templates
After the training you would be able to Answer ...

- Finding worst-case number of losses and worst-case single loss amount, given loss data
- Perform exploratory data analysis and statistics
- Identify data characteristics and fit frequency and severity distributions to data using Moment matching, Maximum likelihood and Quantile matching
- Understand Extreme value distribution and VaR approximation for heavy tailed distributions
- Adjust for loss thresholds in parameter estimates

• Distribution selection and identifying best fits using statistical and visual tests.
• Aggregate loss modeling for single BL/ET cell using parametric and non-parametric Monte Carlo Simulation
• How to incorporate insurance benefit in OpVaR estimates in line with BIS AMA requirements
• Understanding dependence between loss data across BL/ET
• Aggregating OpVaR across all BL/ET cells

• Understanding that EVT is not a panacea to tail risk estimation. Selecting loss threshold for EVT and checking its applicability to bank’s data
• Understanding parameter uncertainty, requirement of minimum data points, simulations etc.
• Using external data and Performing scenario analysis using Percentile, Interval and Individual Scenario approach
• Technical parameters to evaluate OpVaR modeling software and UAT test cases
Topics Covered
Operational Risk Modeling would involve ...

1. Introduction to operational risk modeling
2. Probability Distributions Concepts
3. Modeling number and size of losses using Excel
   1. Frequency distributions
   2. Severity distributions
4. Fitting distributions to data: Parameter estimation
5. Examining goodness of fit
6. Aggregate loss modeling
7. Aggregating VaR estimates across BL & ET
8. Precautions while using EVT/GPD to avoid overestimation of capital reqt
9. Confidence about parameter estimates
10. Using External data in OpVaR estimation
11. Combining capital estimates
12. Operational risk modeling software
13. Introduction to R: an open-source operational risk modeling software

Get a hands on Excel Based understanding of Operational risk & Capital Implication Concepts
Study Session I

1. Introduction to Risk Modeling

2. Probability distributions – Basic Concepts
   1. Probability and Cumulative Distribution function (PDF, CDF)
   2. Inverse cumulative distribution function
   3. Quantiles of a distribution
   4. Moments of probability distributions
   5. Summarizing data statistically and visually: Skewness Kurtosis plot, Skewness and Mid-Summaries plot, Histogram etc.

You would learn all the Basic of Probability Distributions and its analysis techniques

Excel Templates for PDF, CDF and Moments would be provided
Study Session II

1. Introduction to counting distributions
   1. Poisson distribution
   2. Negative binomial distribution
   3. Binomial distribution
   4. Geometric distribution

2. Modeling Number of losses using Excel: Frequency Distribution
   1. How to choose an appropriate distribution?

You would learn Modeling number of losses using Excel: Frequency distributions

Excel Templates for Frequency Distributions would be provided
Study Session III

1. Introduction to Continuous Distributions
   1. Exponential distribution
   2. Gamma distribution
   3. Weibull distribution
   4. Lognormal distribution
   5. Inverse Gaussian distribution
   6. Extreme value theory: Generalized Pareto Distribution
   7. G-and-h distribution
   8. Other severity distributions used by AMA Banks including Mixture distributions

2. Modeling Severity of Losses
   1. How to choose an appropriate distribution?

   You would learn steps in Modeling size of losses using Excel: Severity distributions

   Excel Templates for Severity Distributions would be provided
Study Session IV

1. Fitting Data to Distribution – Parameter Estimation
   1. Moment Matching Estimates (MME)
   2. Maximum Likelihood Estimates (MLE)
   3. Percentile/Quantile Matching

2. EVT: MLE, PWM and Hill estimator

3. How to deal with truncated (presence of threshold) data?

You would learn Fitting distributions to data: Parameter estimation

Excel Templates for MME, MLE, Percentile Matching would be provided
Study Session V

1. Estimating Goodness of Fit
   1. KS, AD, Chi-square, Cramér–von-Mises tests
   2. Visual tests: QQ-plot, pp-plot, CDF and PDF
   3. Likelihood and Information criteria tests: Log likelihood, AIC, BIC

You would learn about Examining goodness of fit

Excel Templates & Functions for Severity Distributions would be provided
Study Session VI

1. Aggregate Loss Modeling Techniques
   1. Monte Carlo Simulation (MCS) to combine frequency and severity distributions
      1. Generating random numbers from different distributions in Excel
      2. Parametric and Empirical simulations
   2. Fast Fourier Transform
   3. Incorporating insurance benefits

*Learn Aggregate loss modeling*

*Excel Templates & Functions for MCS would be provided*
1. Aggregating VaR estimates Across Business Lines (BL) and Event Types (ET)
   
   1. Understanding dependence and copula
   2. Dependence measures for copulas: Kendall's Tau, Spearman's Rho, tail dependence
   3. Using Excel to estimate aggregate OpVaR

Learn Aggregating VaR estimates across Business Lines and Event types

Excel Templates & Functions for Aggregation Using Copula would be provided
Study Session VIII

1. Precautions while using EVT/ GPD to avoid overestimation of Capital Requirement
   1. Checking applicability of EVT to data: Mean excess plot, Hill plot, Qplot, log-log plot
   2. How to select a threshold?

2. Confidence about Parameter Estimates
   1. Measuring parameter uncertainty using parametric and non-parametric bootstrapping, Stress testing

Precautions while using EVT/GPD to avoid overestimation of capital requirement

Excel Templates for estimative Parameter Uncertainty would be provided
Study Session IX

1. Scenario analysis using Excel
   1. Percentile approach, Interval approach, Individual scenario approach
2. Using External data in OpVaR estimation
3. Combining capital estimates based on internal data, external data and scenario analysis

Learn About Scenario Analysis and practical problems and approaches

Excel Templates for scenario analysis would be provided
Study Session X

1. Operational risk modeling software
   1. List of technical parameters to evaluate OpVaR modeling software
   2. UAT test cases with expected output

2. Introduction to R: an open-source operational risk modeling software

Learn to understand and use different Risk Modeling Software

Key Parameters for OpVar system selection and UAT test cases would be provided
How it works?

You signup for the program by making online payment

$247

One time payment

Add to Cart
How it works?

1. Login to Risk Modeling School with the user ID & Password emailed to you
How it works?

Access Lessons, Videos and Download Examples As you Like

The following is a table and graph of predicted loss event frequencies based on your judgement. Click on the buttons below or adjust your response to Q2 to best reflect your judgement.

<table>
<thead>
<tr>
<th>No of Events in a Period</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>0.00</td>
</tr>
<tr>
<td>138</td>
<td>0.00</td>
</tr>
<tr>
<td>145</td>
<td>0.05</td>
</tr>
<tr>
<td>152</td>
<td>0.10</td>
</tr>
<tr>
<td>159</td>
<td>0.15</td>
</tr>
<tr>
<td>166</td>
<td>0.20</td>
</tr>
<tr>
<td>173</td>
<td>0.25</td>
</tr>
<tr>
<td>180</td>
<td>0.20</td>
</tr>
<tr>
<td>187</td>
<td>0.15</td>
</tr>
<tr>
<td>194</td>
<td>0.10</td>
</tr>
<tr>
<td>201</td>
<td>0.05</td>
</tr>
</tbody>
</table>
How it works?

1. Ask Questions or Comment on Lessons to Get Answers
How it works?

Take up Home work & Class project assignments to Sharpen your Skills

The following is a table and graph of predicted loss impacts based on your above judgements. Click on the buttons below or adjust your response to Q5 to best reflect your judgement.
Methodology

Each topic will be explained through Videos, Excel templates, Screencasts & Text Posts
What to expect at the end?

Towards the end of Operational Risk Modeling Course*

- You will be able to understand Practical Aspects of Op. Risk
- You will understand and be able to implement Risk Analytics
- You will know how to use different Risk Modeling Software for analysis
- You will get a certificate of participation

*assuming you follow the program and practice
Who is going to teach?

**Dinesh Chaudhury**, Director, Asymmetrix
Dinesh has worked as a Basel II Project Manager with one of the Top-3 private sector banks in India. Dinesh has worked extensively on corporate risk management, capital management, risk parameter estimation and validation, operational loss data and risk policy framework.

**Paramdeep Singh**, Director and Faculty, Pristine
Paramdeep has an extensive experience in the financial services, consulting and training domain. He has authored research papers and trained 1000s of senior people in the area of Operational Risk, quantitative analysis and risk management.

**David Harper**, CFA, FRM, CIPM, Founder, BionicTurtle
Prior to launching bionicturtle.com, David was a consultant to executives and Boards. He advised primarily to technology and financial firm on transactions (IPSO, M&A), incentives and performance improvement (economic value added).
Duration of the Program – Operational Risk

10 Weeks of Active Learning

6 Months Online Membership

Operational Risk School classes start on October 24th
Cost of the Program

$197
Online Classes
Operational Risk

$247
Online Classes + File Download
Operational Risk
Payments & Registration

launches on 24\textsuperscript{th} of October, 2011
How to pay?

Visit

http://www.edupristine.com/courses/operational-risk
Questions & Doubts?

Please e-mail me at paramdeep@edupristine.com

or visit http://bionicturtle.com/

http://www.edupristine.com

or call +91 989 298 0608
See you in Risk Modeling School...