Client model specifications for StopRisk
Questionnaire

Providing the following information will allow us to provide a proposal to you for a tailored Operational Risk model solution using our StopRisk system. Please provide a document responding to each question in as much detail as possible. Please address any questions and provide a document with your responses to stoprisk@vosesoftware.com.

[Note on terminology: *controls* reduce the chance of a risk event occurring; *mitigations* reduce the chance and/or magnitude of a loss; *drivers* effect the chance of a risk event occurring. Drivers can be thought of as *business environment factors* under the Basel II AMA method, and controls and mitigations as Basel II *internal control factors*.]

Purpose

Q1: Is the model for determining VaR (capital allocation) calculations only, or also to provide additional useful information for risk management? For example, identifying the business units or operations that contribute the greatest risk, assessing the cost-effectiveness of insurance policies, or determining the reliance on specific risk management strategies.

Q2: Do you have a risk register? Is it in a database? Does it include quantitative information about drivers, controls and mitigations? If not, would you like one?

Q3: Do you wish to perform any risk management optimization?

Q4: Is there more than one model? If so, please answer the questions below for each model as appropriate

Q5: Should the model include drivers, controls and mitigations explicitly?

Controls and storage

Q6: Do you require an audit trail for model versions and results?

Q7: Should the results be held in a database?

Q8: Creating scenarios –what variables do you want to change?

Q9: Will there be a constant base scenario to compare against?

Q10: Do you need control of the random number seed?

Q11: Do you need to be able to see the random scenario that generated a specific simulated result? This can be useful for testing (if, for example, the model produces an extreme loss), or for validation (if the regulator requires that one demonstrates that the model includes specific loss events).

Access

Q12: How many modelers will use the system?

Q13: How many risk managers will use the system?

Q14: Should risk managers have access via tablet?

Q15: Do you need password-protected access rights to the system?

Model writing

Q16: Who is to write the model – Vose Software or you, or together?

Training

Q17: Do you need:

- Training for management on interpretation and scenario/storage system?
- Training for analysts to adapt the model?

Q18: Is any training to be given on location, or via the web?

Model type

Q19: Should losses be split by business units or other entities?

Q20: Do you want to include effects of insurance? If so:

- Do you want a loss distribution with/without insurance comparison?
- What rules does the regulator impose on the loss reduction allowed?
- Do you have cascading policy coverage (e.g. losses are claimed against Policy B when Policy A is exhausted)? If so, we will need a logic for how you would select the policy sequence to claim against

Q21: Is the model to be scenario-based, data-based or a mixture?

Q22: Should losses be organised by Basel II cells, another structure, or both?

Q23: Do you need to calculate diversification effects by business unit, region?

Databases

Q24: Should the model be connected to any database? If so:

- What type? What protocol?
- What information are contained in the databases?

Correlation

Q25: Should the model include correlation? If yes:

- Will this be explicit causal correlation modelling – business environment (drivers) or a copula surrogate?
- If (a) copula(s)
  - Will the correlation be between aggregate loss or frequency distributions?
  - Which type (Gauss, T, Clayton, Frank, Gumbel, Data)?
  - Would you like to assign correlation using coefficients or descriptions?
  - Do you need correlation at multiple levels?
  - If (a) Gauss or T copula(s), should the model automatically verify the validity of the coefficients and adjust automatically if not positive semi-definite?

Time dependency

Q26: Should the model report the loss statistics at different time periods? If so:

- How do you wish for correlation between periods to be included?
- Are there any time-dependent variables to be included in the model (eg GDP growth, xrates, inflation)? Do you have forecasts, or historic data to fit time series models to?

Performance

Q27: Do you have a required number of samples to run, or a level of precision for the results?

Q28: What is an acceptable amount of time to generate the results (seconds, minutes)?

Distribution fitting

The following only apply if you are using loss data for statistically determining loss frequency and severity distributions:

Q29: Will loss severity and frequency distributions be fitted to:

- Internal loss data only?
- External loss data only?
- Internal and external loss data?

Q30: Are the loss data held in database?

Q31: By default StopRisk uses maximum likelihood routines for fitting distributions, ranking level of fit by the adjusted Akaike information criterion. Do you require a different method?

Q32: Should the fitting algorithm account for reporting thresholds for internal, external loss data or both?

Q33: By default, StopRisk will include the following distribution types for fitting to data: Severity - Lognormal, GPD, Exponential, Gamma, Lognormal/GPD splice; Frequency – Poisson. What other distribution types, if any, should be included?

Q34: Typically, StopRisk will fit the distributional form to external loss data to get a distribution shape, recalibrate the distribution to internal loss data to get a scale, and use internal loss history to estimate the frequency distribution. Do you have another method you prefer?

Presentation

Q35: What are the minimum statistics required to be reported? For example:

- Variables: total loss / unexpected loss, loss by business unit/region
- Statistical measures: VaR and/or CVaR at specific probabilities, probability of exceeding specific loss levels, probability of no loss, mean loss

Q36: Cumulative and relative plots are provided as standard for all loss distributions. Tornado plots are also useful for sensitivity analysis. Would you like to include Tornados in a report? If so:

- The most useful types are Conditional Mean, or conditional VaR sensitivity. Do you have a preference?

Q37: Do you need to be able to print reports to PDF, PowerPoint, Word, and/or Excel?

Q38: Do you need an electronic version of the results report that can be interrogated and shared?

Regulator

Q39: Do(es) the regulator(s) have specific requirements for:

- Modelling?
- Reporting?
- Data use?
- Statistical procedure?
- Auditing trail?
- Validation method?

Documentation

Q40: Which of the following supporting documentation do you require? Which formats (pdf, help file, or web page)?

- Explanation of the assumptions and mathematics of the model
- Explanation of how to create and compare scenarios
- Explanation of how to verify the model