The workshop provides an oppor tunity for SCOR’s experts (based here in London, Zurich, Paris and New York) to compare their point of view.

"Dependence tends to become more apparent in periods of crisis."
Michel Dacorongsa, Deputy Chief Risk Officer, SCOR

Protection from extreme risks and their concomitance

Extreme risks are the most serious threat to (re)insurance companies and the financial sector. Their consequences are manifold and their impact severe. In other words, when an extreme event occurs (e.g. earthquake, pandemic, financial crisis, etc.), it is based on a mathematical model that allows the estimation of these complementary information sources. An innovative scientific method is used, which has been shown to be effective and reliable.

In order to reduce significantly the uncertainty around the parameters, a copula function can be used to model the probability, given that an extreme event has affected one risk portfolio, that the same event will also affect another portfolio.

Copula functions allow one to prudently model the probability, given that an extreme event has affected one risk portfolio, that the same event will also affect another portfolio.

The copula function allows the probability, given that an extreme event has affected one risk portfolio, that the same event will also affect another portfolio.

Eliciting the relevant information

The lack of statistical data on extreme events makes conventional mathematical tools inefficient. PIoBE has been designed to overcome this issue by grouping together multiple information sources. An innovative scientific method is used to process the relevant information in order to reduce significantly the uncertainty around the parameters. PIoBE combines up to three different sources of information. Prior information (existing information), Observations (statistical data) and Expert opinions.

The combination of all three information sources provides additional knowledge about each variable, and notably, its correlation with others. This joint use can severely reduce the parameter uncertainty and result in purely mathematical figures that can be directly applied in the model.

Aggregating expert opinions

Expert opinions are at the heart of PIoBEs. They are collected during workshops that meet two objectives: obtaining the most precise and relevant information, and aggregating this information so that it can be used in a probabilistic framework. The aim of an opinion is an input into a scientific measurement requirement compliance with an extremely strict procedure, in order to ensure that the results obtained are objective and recognized as such. For this reason, the psychological dimensions of expert quantification of opinions must also be carefully taken into account.

In order to deal with these issues, experts’ opinions, which are centred on their own areas of expertise, the seminars are also attended by managers. Their global vision of the challenges at hand brings greater balance to the model.

The workshop provides an opportunity for SCOR’s experts (based here in London, Zurich, Paris and New York) to compare their point of view.

A rigorous process

The expert opinion elicitation process follows the following five principles:

1. Eliciting the relevant information
   - Opinion is based on a mathematical model that allows the estimation of these complementary information sources.
2. Observation (i.e. the statistical data)
   - Observation (i.e. the statistical data)
3. Expert opinion (i.e. the knowledge of the experts)
   - Expert opinion (i.e. the knowledge of the experts)
4. The combination of these three sources as an integral part provides improved risk assessment as well as optimal capital allocation and proposed tariffs.
5. The questionnaire is designed in advance by the PrO BEx team, according to the specific characteristic of each risk, compared with other tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.

The workbench begins with a training session on the aims and methods used, with a reminder of the mathematical tools. The psychological aspects inherent to this type of questionnaire are also discussed.

The session ends with the questionnaire to be completed, a carefully designed stage that can last up to 90 minutes.

In theory, it must be possible to conduct future checks of expert opinions on the basis of a sound mathematical approach.
PrObEx, a scientific innovation to assess the dependence between risks

When a (re)insurance portfolio is acquired, each risk is assessed by experts. Yet for (re)insurers, it is essential to determine the dependence between the different risks, i.e. their statistical correlation. Sovereign defaults, changes in oil and gas prices, depreciations of national currencies and the return of inflation in a currency area are all (individual) events that are likely to be linked by a level of interdependence, either due to the occurrence of an event increasing the probability of another occurring, or because different events can be triggered by common causes. Individually, each risk is generally well known by (re)insurers. However, their dependence, and therefore the probability of their co-occurrence, remains insufficiently managed. These links between occurrences of risks are a major challenge for all (re)insurers.

A new method has therefore been developed at SCOR to properly quantify and strategically manage dependence among risks: PrObEx.