ANAS ABDALLAH, Université Laval

**Modeling Dependence Between Loss Triangles Using Hierarchical Archimedean Copulas**

One of the most critical problems in casualty property insurance is to determine an appropriate reserve for the incurred but unpaid losses. The provisions are the largest part of the liabilities of a non-life insurer. The global provisions are often determined under the independence assumption. Firstly, we suppose a dependence between all the observations that belong to the same calendar year for all lines of business using multivariate Archimedean copulas. Secondly, we suppose another dependence structure that links the calendar years of different lines of business by using hierarchical Archimedean copulas. When applied to data, our models provide a better fit than existing models, and offer a better and more realistic interpretation of the dependence between the lines of business.

FANGDA LIU, University of Waterloo

**Optimal Reinsurance with Regulatory Initial Capitals and Default Risks**

In a reinsurance contract, a reinsurer promises to pay the part of the loss faced by an insurer in exchange of receiving a reinsurance premium. However, when the promised indemnity exceeds the total of the reinsurance premium and the reinsurer’s initial capital which is determined by the value-at-risk (VaR) of its promised indemnity, the reinsurer may fail to pay the promised amount or default may occur. In the presence of regulatory initial capitals and counterparty default risks, we investigate optimal reinsurance designs from an insurer’s point of view and derive optimal reinsurance strategies that maximize the expected utility of an insurer’s terminal wealth or minimize the VaR of an insurer’s total retained risk.

HASSAN OMIDI, Université de Montréal


The field of risk theory has traditionally focused on ruin-related quantities. Although interesting in their own right, ruin related quantities do not seem to capture path-dependent properties of the reserve. In this presentation we aim at presenting the probabilistic properties of drawdowns and the speed at which an insurance reserve depletes as a consequence of the risk exposure of the company. This type of quantities has never been proposed before as measures of riskiness in insurance. We derive expressions for the distribution of drawdowns and the Laplace transform for the speed of depletion. These expressions are given for some examples of Levy insurance risk processes for which they can be calculated, in particular for the classical Cramer-Lundberg model.

OSCAR QUIJANO, Concordia University

**Linear Credibility for GLM Losses**

We consider actuarial credibility theory for expected losses estimated with Generalized Linear Models (GLMs). We use a Bayesian approach and appropriate priors for the regression coefficients that lead to Linear Credibility. These conjugate priors are then used to find confidence intervals for the regression coefficients. Illustrative examples will also be discussed.

DAMENG TANG, University of Toronto

**Fitting Erlang-Based Mixture Models to Operational Loss Data**

Modeling and quantifying the operational risk are now required by the Basel Committed on Banking Supervision and become a critical part of the risk management of a financial institution. A general quantitative approach is the so-called Loss Distribution
Approach (LDA). In this paper, we propose an Erlang-based mixture model approach in which the frequencies among the units are dependent and modeled via a multivariate mixed Poisson process, while the severity in each unit is modeled by a mixed Erlang model. Under our approach there is no need to use a copula and the use of Monte Carlo simulation is minimal. Using real operational loss data from the Operational Riskdata eXchange (ORX), we demonstrate the efficiency and accuracy of the approach.

CHEN YANG, Western University
On the Threshold Strategy for Dividend Payments Under the Dual Model Perturbed by Diffusion

In this paper, we revisit the threshold dividend payment strategy of the dual risk model with a surplus process perturbed by a Brownian motion. We study the relevant Gerber-Shiu functions and obtain explicit expressions of the expected discounted dividends until ruin in terms of the $\delta$-scale functions. Finally, we illustrate our results by deriving a more specific explicit expression for the expected discounted dividends when the jump size distribution is from the $K_n$ family.