ISFA Lyon et DSA-HEC Lausanne

62e Journée de séminaires actuariels

Mercredi 16 novembre 2016

à l'Unil

- **9 h 30**

  Accueil des participants

Salle Internef 271

- **10 h 00**

  Raimondo Manca, Sapienza University of Rome

  « Construction of Mean Salary Lines by Generalization of Binomial Stochastic Process »

- **11 h 00**

  Daniela Laas, Institute of Insurance Economics, University of St. Gallen

  « Extreme Value Mixture Models: Are They Able to Cope with Extreme Insurance Losses? »

Salle Extranef 109

- **14 h 00**

  Jean-François Chassagneux, University Paris Diderot, LPMA

  « Large population stochastic control: analysis and numerical solution of the master equation »

- **15 h 00**

  Yulia Farkas, Université de Lausanne

  « Ruin Probabilities for Portfolios of Gaussian-like Risks »

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Speaker: Raimondo Manca, Sapienza University of Rome

Title: « Construction of Mean Salary Lines by Generalization of Binomial Stochastic Process »

Abstract: We will present how it is possible to forecast the development of a worker salary line. This problem is part of the general problem of "man power planning" that is a typical problem of operations research. First of all, it will be shown the construction of the probabilities of the rank changes. After the calculation of these probabilities it is possible to obtain the expected mean salary lines. The construction of mean salary lines could be useful to a firm that should change the rules that govern the rank promotion having the possibility to calculate the cost of the new rules and its comparison with the old ones. It could also be useful for a person that belongs to a given "cohort" of individuals with the same salary characteristics. Furthermore, the forecasting of mean salary lines is fundamental for the calculation of the future contributions and of the costs of a pension fund. This fact holds for both the Defined Contribution and Defined Benefit Pension Schemes. In the first part we present the problems and the models useful for the construction of mean salary lines. After the construction of related algorithms will be presented. At least some real life example will be given.

Speaker: Daniela Laas, Institute of Insurance Economics, University of St. Gallen

Title: « Extreme Value Mixture Models: Are They Able to Cope with Extreme Insurance Losses? »

Abstract: This paper provides a critical analysis of extreme value mixture models for the approximation of heavy-tailed insurance loss distributions. In a Bayesian framework, we consider various extreme value mixture models with different degrees of complexity. Based on an empirically calibrated distribution of windstorm losses, we perform a comprehensive simulation study and examine the accuracy of the tail approximation, extrapolation to out-of-sample quantiles, variation of results across different data sets, and influence of outliers. Moreover, the models are applied to samples of U.S. hurricane losses and fire insurance losses reported by Aon Re Belgium. Our analysis shows a substantial variation of the results across different samples and a substantial impact of extreme observations. In comparison to the peaks-over-threshold approach, the extreme value mixture model approach leads to a good tail fit for the distribution of windstorm losses. For the samples of hurricane and fire losses, in contrast, the estimation errors are substantially higher than under the peaks-over-threshold method. The tail fit is not robust with regard to the adequacy of the bulk model distribution and the choice of an inappropriate bulk component can lead to very low thresholds and biased tail estimates.

Speaker: Jean-François Chassagneux, University Paris Diderot, LPMA

Title: « Large population stochastic control: analysis and numerical solution of the master equation »

Abstract: In this talk, I will first describe some problems in large population stochastic control (e.g. Mean-Field Games). The solution to these problems are characterised by a master equation, as observed by Lasry-Lions, which is a PDE written on the Wasserstein space of probability measure. I will then recall the probabilistic representation of its solution in term of a (fully coupled) FBSDE with McKean-Vlasov interaction. Finally, I will introduce a scheme for this class of BSDEs and demonstrate its convergence both theoretically and practically. This is a joint work with D. Crisan and F. Delarue.

Speaker: Yulia Farkas, Université de Lausanne

Title: « Ruin Probabilities for Portfolios of Gaussian-like Risks »

Abstract: In this talk we show how to derive higher order approximations of certain Weyl fractional integrals. We apply our findings to derive higher order tail approximations for deflated risks as well as approximations of Haezendonck-Goovaerts and expectiles risk measures. Illustration of the obtained results is done by various examples and some numerical analysis. The main objective of this talk is to explain the joint tail asymptotics of aggregated Gaussian-like risks. The current literature covers only the case of one dimensional Gaussian-like risks, i.e., the tail of S= X_1 + X_2+...+ X_d is derived explicitly when X_i's are Gaussian like risks. Such random variable is useful when modelling reinsurance portfolios. In order to model simultaniously several portfolios, we extend the univariate results to the multivariate setting. In particular, we recover the tail asymptotic of Gaussian random vectors.

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