

## SÉMINAIRE DE MATHÉMATIQUES ACTUARIELLES ET FINANCIÈRES

organisé par Quantact, le Laboratoire de mathématiques actuarielles et financières du CRM

LB-921.04

1400 de Maisonneuve Ouest, Montréal

Pavillon J.W. McConnell (Library) Building, SGW Campus, Concordia University

27 mars 2015, 14:00-16:30

### **Alain Bélanger**

Université de Sherbrooke

#### **Over-the-Counter Market Models**

We develop an approach, inspired by the work of M. Kac in the statistical physics of gases, where the random matching of a large population of investors is asymptotically independent. We start with a sequence of dynamical systems of  $N$  interacting components and as  $N$  grows large we show that the probability gets very small that a component has interacted more than once, directly or indirectly, with any other component. This fundamental property enables us to link the microscopic and macroscopic levels using results from the theory of continuous-time Markov chains. We then obtain the solution of the non-linear evolution equation, in the case of a single interacting kernel, by a series construction we call extended Wild sums. We show afterwards how to retain the explicit nature of the solution when there are more than one type of interactions. This is joint work with G. Giroux and N. Ndouné.

### **Florin Avram**

Université de Pau, France

#### **On a capital management problem for a central branch with subsidiaries**

We study an extension of a risk network model proposed by Badescu and Rabehasaina, concerning a company which must separate a "central manager branch" (CB) from other "subsidiary branches" necessary for coping with different types of catastrophes/claims. The subsidiaries must all be kept above 0 by capital injections subject to transaction costs, until the ruin of the central branch. The underlying question is how to split both the initial total capital and total income rate between the branches, in an optimal way. Several problems, like for example the ruin probability with one subsidiary, admit exact answers as long as the CB is just a deterministic drift. On the other hand, non-deterministic CB's and several subsidiaries give rise to interesting approximation and asymptotics questions. A particular SNMAP approximation obtained by Pade approximation of the downward ladder Laplace transform is implemented. This is a joint work with Martijn Pistorius.

## SEMINAR OF ACTUARIAL AND FINANCIAL MATHEMATICS

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