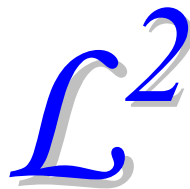


ISFA Lyon et ISA-HEC Lausanne

Lundi 22 janvier 2018

à l'**I.S.F.A.**
Amphi G2

- ≡ 9 h 30 Welcome coffee
- ≡ 10 h 00 Xavier MILHAUD (ISFA)
Risk aggregation in Solvency II: sensitivity of the correlation matrix to some classical operational choices
- ≡ 10 h 45 Discussion by Hansjoerg Albrecher
- ≡ 11 h 00 Chunhua MA (Nankai University)
Alpha-CIR model with branching processes in sovereign interest rate modeling
- ≡ 11 h 45 Discussion by Stéphane Loisel
- ≡ 12 h 00 Lunch
- ≡ 13 h 30 Ilaria DALLA POZA (IPAG)
On customer engagement in service; Towards a new concept of proximity in the frontline employee - customer relationship: the example of the banking and insurance industries
- ≡ 14 h 15 Discussion by Cathy VIOT
- ≡ 14 h 30 Phd talk #1: William Miguel GUEVARA ALARCÓN (UNIL)
Modelling marine liability losses: The long and heavy tail of sinking ships
- ≡ 14 h 50 Q&A's (including 2 questions by ISFA PhD students)
- ≡ 15 h 00 Phd talk #2: Yves STAUDT (UNIL)
Are artificial intelligence methods superior to linear models in MTPL insurance pricing?
- ≡ 15 h 20 Q&A's (including 2 questions by ISFA PhD students)
- ≡ 15 h 30 Phd talk #3: Pierrick PIETTE (ISFA)
Agricultural Insurance and Financial Arbitrage with Satellite Images
- ≡ 15 h 50 Q&A's (including 2 questions by UNIL PhD students)
- ≡ 16h00 Apéro
- ≡ 16h30 Departure



Abstracts:

Xavier Milhaud, ISFA

Title: **Risk aggregation in Solvency II: sensitivity of the correlation matrix to some classical operational choices.**

This paper answers some crucial questions practitioners can ask themselves about the robustness of the PSDisation process, implying the use of genetic algorithms. PSDisation refers to the process that forces a matrix to become positive semi-definite. In the insurance industry, PSDisation appears in the treatment of the correlation matrix used in the aggregation step in order to compute the Solvency Capital Requirement (SCR). We study how this capital requirement calculation is impacted by classical operations on the correlation matrix: permutation of matrix coefficients (equivalently risk factors or business lines), higher matrix dimensions (analogously adding a new business line), and introduction of potential confidence weights given to some correlation coefficients. We show that theoretically neutral transformations of the correlation matrix can surprisingly lead to significant changes on the value of the SCR (up to 6%). These results highlight the need for very strong internal control around the PSDisation step in (partial) internal models.

Chunhua MA, Nankai University

Title : **Alpha-CIR model with branching processes in sovereign interest rate modeling**

We introduce a class of interest rate models, called the α -CIR model, which is a natural extension of the standard CIR model by adding a jump part driven by α -stable Lévy processes with index $\alpha \in (1, 2]$. We deduce an explicit expression for the bond price by using the fact that the model belongs to the family of CBI and affine processes, and analyze the bond price and bond yield behaviors. The α -CIR model allows us to describe in a unified and parsimonious way several recent observations on the sovereign bond market such as the persistency of low interest rates together with the presence of large jumps. Finally, we provide a thorough analysis of the jumps, and in particular the large jumps.

Ilaria DALLA POZA, IPAG

Title: **On customer engagement in service; Towards a new concept of proximity in the frontline employee - customer relationship: the example of the banking and insurance industries**

Abstract: We develop a framework to facilitate customer engagement in service (CES) based on the service-dominant (SD) logic. A novel feature of this framework is its applicability and relevance for firms operating both in developed and emerging markets. First, we conduct a qualitative study involving service managers from multinational companies (MNCs) across the developed and emerging markets to understand the



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Practitioner's viewpoints. By integrating the insights from the interviews and the relevant academic literature, this framework explores how interaction orientation and omni-channel model can be used to create positive service experience. We also identify the factors that moderate the service experience, and categorize them as follows: offering-related, value-related, enabler-related, and market-related. Further, we also propose that perceived variation in service experience moderates the influence of service experience on satisfaction and emotional attachment, which ultimately impacts customer engagement (CE). From these factors, we advance research propositions that discuss the creation of positive service experience. One of the study's key contributions is that MNCs can focus their attention on the moderators to ensure consistency in positive service experience, in an effort to enhance CE.

PhD Talk 1: William Miguel GUEVARA ALARCÓN:

Title: **Modelling marine liability losses: The long and heavy tail of sinking ships**

Abstract: Marine is the oldest type of insurance coverage. However, unlike cargo and hull covers, marine liability is a rather young line of business whose losses can have heavy and long tails. Additionally, the accumulation of losses from the same risk insured by different companies can provoke extreme claims on a marine reinsurance portfolio. This work presents the modeling of a portfolio of large losses for marine liability. The resulting model can be used to price high layers of excess of loss reinsurance contracts for companies with little or no loss experience.

PhD Talk 2: UNIL Speaker

Title: **Are artificial intelligence methods superior to linear models in MTPL insurance pricing?**

Abstract: The accurate pricing of insurance contracts is a big challenge for non-life insurance companies in a competitive market environment and in the presence of price-sensitive customers.

Classical actuarial methods rely on statistical models using variables to explain the loss exposure.

Typically, the claim frequency and severity are modeled separately. Our first aim

is to develop a data-driven procedure to build a standard statistical regression model including

the most significant factors. As the frequency and the severity have positive values,

their distributions are positive and right skewed. In a general way, generalized linear models

(GLM) deal with such situations in statistics. However, continuous covariates are often related

to the response in a non-linear way, this is done by using generalized additive models

(GAM). In a second step, we compare the results of so-called "machine-learning" techniques

with the ones obtained from the (optimal) classical model. In our applications, we rely on a

large data set covering the loss exposure of a motor third part liability (MTPL) insurance

portfolio of a Swiss non-life insurance company. The data set contains more than 1.6 million

policyholder years (exposure) including about 77 500 recorded settled claims.

PhD Talk 3: Pierrick Piette, ISFA

Title: **Agricultural Insurance and Financial Arbitrage with Satellite Images**



INSTITUT DE SCIENCE FINANCIERE ET D'ASSURANCES

Domaine Scientifique de Gerland

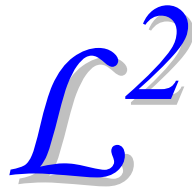
50 Avenue Tony Garnier

69366 LYON CEDEX 07

Tél. (33) 04.37.28.74.40

Fax (33) 04.37.28.76.32

E-mail : isfa@univ-lyon1.fr



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The use of NASA satellite images, in particular the NDVI (Normalized Difference Vegetation Index) data, is spreading in the agricultural insurance industry. The most common product based on this satellite data is the area-yield insurance. Nevertheless, beyond the agricultural risk of having a low yield, farmers also support the financial risk from the commodities market. This risk can be transferred to an insurer through a revenue protection. Our paper investigates the possibility of forecasting some specific reactions of the commodity market thanks to NDVI, thereby allowing the underwriter to apply a financial strategy to mitigate market risk.