Atelier Quantact sur la gestion des risques des fonds distincts

Quantact workshop on risk management of segregated funds

● **Résumés / Abstracts** ●

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Maciej Augustyniak (Université de Montréal)
Frédéric Godin (Concordia University, Université Laval)
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Quantact, le Laboratoire de mathématiques actuarielles et financières du Centre de recherches mathématiques
Autorité des marchés financiers
Université Concordia

Atelier Quantact sur la gestion des risques des fonds distincts

Vendredi, 9 mars 2018

Quantact workshop on risk management of segregated funds

Friday, March 9, 2018

Concordia University
J.W. McConnell Building (Library Building)
LB-646

9:15 - 9:30 - Mot de bienvenue / Welcoming address

9:30 - 10:30 – Frédéric Godin & Denis-Alexandre Trottier,
Concordia University & Université Laval, Montréal & Québec
Local hedging of variable annuities in the presence of basis risk

10:30 - 11:00 - Pause café / Coffee Break

11:00 - 12:00 – Michael Koller, ETH Zürich & Prudential plc, London
Impact of policyholder behaviour on hedging variable annuities

12:00 - 14:00 – Dîner / Lunch

14:00 - 15:00 – Nicolas Essis-Breton, Concordia University, Montréal
Hedging the multiple exercise options offered in variable annuities

15:00 - 16:00 – Bruno Rémillard, HEC Montréal, Montréal
Replication methods for financial indexes

16:00 - 16:30 - Pause café / Coffee Break

16:30 - 17:30 – Emmanuel Hamel & André-Namir Daigneault,
Université Laval & Autorité des marchés financiers, Québec
Regulation and research on segregated funds

17:30 - 17:40 - Mot de la fin / Concluding Remarks

Local hedging of variable annuities in the presence of basis risk

Frédéric Godin
Department of Mathematics and Statistics – Concordia University
École d'Actuariat – Université Laval

Denis-Alexandre Trottier
Faculté des Sciences de la Gestion – Université Laval

We present a simple local hedging approach based on risk measures for the hedging of variable annuities in the presence of equity risk and basis risk. The hedging strategy is obtained by minimizing risk with respect to next-period's cash flow injection within the hedging portfolio by the insurer. Taylor expansion based approximations are used to improve the tractability of the approach by reducing the problem's dimensionality. The impact of basis risk on capital requirements in quantified. The hedging performance of our approach is compared to industry benchmarks such as fund mapping regressions.

Impact of policyholder behaviour on hedging variable annuities

Michael Koller
Department of Mathematics – ETH Zürich
Prudential plc, London

In this presentation, I will review the different features of variable annuities and their interactions with each other. Risk management of variable annuities will then be discussed, with a particular focus on the impact of policyholder behaviour on valuation and hedging. Different models dealing with policyholder behaviour risk will be presented, along with numerical results.

Hedging the multiple exercise options offered in variables annuities

Nicolas Essis-Breton
Department of Mathematics and Statistics – Concordia University

Variable annuities are regularly sold with many embedded options. A well-known option is the right to surrender the contract, a standard American put option. Less well-known and less studied options are the options to purchase additional funds units, to reallocate the account balance between funds, and to reset the account balance to a previous value. These options are American, can be exercised multiple times, and are all offered simultaneously. In this talk, we show how to model the pricing of such options as a global optimization problem. This approach stands out because it is not based on the classical dynamic programming approach. In particular, variable annuities combining all the previous options can be accurately and quickly priced. The key idea behind the approach is to set up the global optimization problem through a Gauss quadrature condition and to enforce adaptivity explicitly also through a quadrature condition.

Replication methods for financial indexes

Bruno Rémillard
Department of Decision Sciences – HEC Montréal

In this talk I will present statistical tools that can be used in asset management either to track financial indexes or to create synthetic ones. These tools include copula models, optimal hedging, regression and filtering techniques. At first, these replication techniques were used to try to replicate hedge funds indexes, but nowadays they can also be used to construct Exchange Traded Funds.

Regulation and research on segregated funds

André-Namir Daigneault
Autorité des Marchés Financiers

Emmanuel Hamel
Autorité des Marchés Financiers (AMF)
École d'actuariat – Université Laval

André-Namir Daigneault and Emmanuel Hamel, both policy analysts at the l'Autorité des marchés financiers, also called the "AMF", will make a presentation in two parts. The first part will be related to the regulation of segregated funds in Canada and the recent modifications of the regulation of segregated funds in Québec. The second part will concern research projects being performed at the AMF related to segregated funds: interest rate modeling, scenario reduction methods (joint work with Yvonne Chueh and Donald Davendra) and use of a hybrid framework "CPU and GPU (Cuda C and / or OpenACC)" to reduce calculation time.