
DGVFM-Workshop für junge Mathematiker
Wissenschaftszentrum Schloss Reisenburg
28. bis 30. Oktober 2020

Mittwoch, 28.10.2020

Anreise ab 14:00 Uhr möglich

15:00 – 16:00 Uhr	<i>Kaffee und Kuchen</i>
16:00 – 16:30 Uhr	Begrüßung und Einführung, Vorstellung der Teilnehmerinnen und Teilnehmer
16:30 – 17:00 Uhr	Prof. An Chen „Informationen zur Aktuarsausbildung (DAV)“
17:00 – 18:15 Uhr	Dr. Frank Halanke (Allianz SE, DHBW Stuttgart) „Investment strategies for long-term liabilities“
18:30 Uhr	<i>Abendessen</i>

Donnerstag, 29.10.2020

08:30 - 09:15 Uhr	<i>Frühstück</i>
09:30 - 10:45 Uhr	Prof. Dr. Pierre Devolder (Universität Louvain, Belgien) „DB or DC: is this the right question? Some actuarial considerations about public Pension Schemes“
10:45 - 12:00 Uhr	Prof. Dr. Elena Vigna (Università di Torino, Italien) „Mean-variance dynamic optimality for DC pension schemes“
12:30 – 13:30 Uhr	<i>Mittagessen</i>
13.30 - 14:30 Uhr	Führung durch Schloss Reisenburg
15:00 – 15.45 Uhr	<i>Kaffeepause</i>
15:45 – 17:00 Uhr	Dr. Michael Kochanski (SV SparkassenVersicherung Lebensversicherung AG) „N.N.“
17:00 – 18:15 Uhr	Thorsten Sehner (Universität Ulm) „N.N.“
18:30 Uhr	<i>Abendessen</i>



Freitag, 30.10.2020

08:30 - 09:15 Uhr

Frühstück

09:30 – 10:45 Uhr

Prof. Dr. Alfred Müller (Universität Siegen)
**„Dependence uncertainty bounds for the energy score
and the multivariate Gini mean difference“ (joint with
Carole Bernard and Marco Oesting)**

10:45 – 12:00 Uhr

Dr. Peter Hieber (Universität Ulm)
**“Retirement products and subjective mortality beliefs”
(joint with An Chen and Manuel Rach)**

12:00 – 12:15 Uhr

Abschlussrunde, Evaluation

12:30 Uhr

Mittagessen

14:00 Uhr

Ende der Veranstaltung

Vorträge / Referenten

Dr. Frank Halanke

„Investment strategies for long-term liabilities“

In this talk we discuss the main risk drivers for very long-term liabilities and the corresponding asset portfolios on the example of pension obligations. We develop the strategic long term targets for the investment strategy and tactical short term constraints.

We will gain an understanding of the valuation of long-term liabilities with payments far beyond 30 years under different regulatory frameworks like Solvency II and IFRS. For this valuation the choice of a discount curve is essential but everything else than trivial as there is no deep market of bond instruments for such long maturities. We compare the “ultimate forward rate” used in Solvency II to deal with this problem with methods used under IAS19 which is explicitly excluding any use of such an a priori defined rate. Therefor even a perfect match under Asset Liability Modeling (ALM) aspects could lead to duration mismatches and Solvency Capital Requirements (SCR) given the different regulatory regimes of IFRS and Solvency II for assets and liabilities.

Finally we discuss why an holistic Environmental Social and Governance (ESG) approach plays a fundamental role for these long term investments and what UN-Convended Net-Zero Asset Owner Alliance (AOA), a group of long-term investors representing \$5 trillion assets under management, can possibly contribute to this development in the future, maybe as well from a mathematical point of view.

Dr. Halanke übernahm 2006 die Funktion des Global Actuary in der Allianz SE. Davor war er Mitglied der Geschäftsleitung der Allianz Financial & Insurance Services GmbH und Leiter Bilanzlösungen der Allianz Dresdner Pension Consult. Vor seiner Zeit im Allianzkonzern war er 5 Jahre bei KPMG im Bereich Actuarial Services. Er ist Mitglied der DAV, der IEBA, des IVS und speziell dessen Arbeitsgruppe internationales. Daneben ist er als Gastprofessor an der DHBW in Stuttgart tätig.

Prof. Dr. Pierre Devolder

“DB or DC: is this the right question? Some actuarial considerations about public Pension Schemes“

In many countries, traditional Defined Benefit (DB) public pension schemes are under pressure for financial reasons but also for design challenges. The aging issue, mainly due to the increasing longevity, put into difficulty the combination DB and Pay as you go (PAYG), as usually used in a majority of social security plans. At the same time, the structure of these classical pensions schemes are no more adapted to new flexibilities of the job market such as individual decision in terms of retirement age. In order to address these issues, some countries have decided to switch to DC schemes (Defined Contribution) for their social security, either still in PAYG (NDC = Notional Defined Contribution - Sweden, Italy) or in funding (Chile). If these reforms can improve the financial sustainability, they have also generated social adequacy concerns for the retirees and can be seen as unfair. The purpose of the presentation is to present intermediate approaches between classical DB plans and NDC notional accounts, using inter-generational risk sharing of the aging cost and automatic adjustment mechanisms. The design of good or even optimal mechanisms of adjustment in a stochastic demographic and financial environment is in particular an important and interesting topic implying actuarial challenges. The influence of longevity spreads between different socio economic groups will also be addressed in terms of intra generational fairness.

Keywords: Social security, Pension schemes, Aging, Risk sharing, Financial sustainability, Automatic adjustment, Longevity heterogeneity

Pierre Devolder holds an MSc. and PhD in Mathematics, as well as an MSc. in Actuarial Sciences, all obtained Summa Cum Laude. Besides being an active member of the Institute of Actuaries in Belgium (IA|BE) and a member of the Insurance Commission, he is also a professor at the University of Louvain (UCL) and president of the actuarial consulting company Reacfin s.a. (Louvain, Belgium). His activities and research are focused on quantitative finance and pension theory, which he teaches at the Universities of Louvain (UCL), Strasbourg and Rabat. He has published various books in the actuarial field and is the author of many highly awarded articles by the leading actuarial society. In the past, Pierre worked for AXA Belgium, where he was a board member. He was also an expert appointed by the Belgian Minister of the Self-employed, SMEs and Agriculture and had a key role in the reform of the Belgian pension. Pierre has also carried out scientific studies for GDF/Suez about pricing electricity derivatives.

Prof. Dr. Elena Vigna

"Mean-variance dynamic optimality for DC pension schemes"

In this paper we deal with the mean-variance portfolio selection for a defined contribution (DC) pension fund. Since this problem is time-inconsistent, a number of papers have proposed to tackle it through either a Nash equilibrium approach or a precommitment strategy. Here, we adopt the dynamically optimal approach introduced by (Pedersen and Peskir, 2017), and we compare the dynamically optimal strategy with the precommitment one. While it is well known that the precommitment strategy is the solution to a target-based problem, we show that the same holds for the dynamically optimal strategy. In particular, the precommitment strategy has a constant target, while the dynamically optimal strategy has a time-varying target whose expectation coincides with the constant target of the previous case. We also show that the expected wealth is the same under the two approaches. Numerical applications show that (i) the median of the risky asset's share is lower for the precommitment than the dynamically optimal strategy; (ii) the amount of money invested in the precommitment risky portfolio is highly more volatile than in the dynamically optimal case; (iii) the variance of wealth is lower with the precommitment strategy than with the dynamically optimal one; (iv) under scenarios of extreme market returns (either good or bad), the dynamically optimal strategy allows a more effective reaction because of the continuous adjustment of the final target.

Education:

PhD in Applied Mathematics, Università di Trieste, 2000

Research Interests:

Actuarial Science, Portfolio Selection

Affiliations:

Assistant Professor of Applied Mathematics, Università di Torino

Selected Works:

- Mean-variance target-based optimisation for defined contribution pension schemes in a stochastic framework, with F. Menoncin, Insurance: Mathematics and Economics 76, 172-184, 2017
- Single and cross-generation natural hedging of longevity and financial risk, with E. Luciano and L. Regis, to appear on Journal of Risk and Insurance, 2015
- Income drawdown option with minimum guarantee, with M. Di Giacinto, S. Federico and F. Gozzi, European Journal of Operational Research 234, 610-624, 2014

Dr. Michael Kochanski

„N.N.“

Thorsten Sehner

„N.N.“

Prof. Dr. Alfred Müller

„Dependence uncertainty bounds for the energy score and the multivariate Gini mean difference“ (joint with Carole Bernard and Marco Oesting)

There is an increasing interest in recent years in methods for assessing the quality of probabilistic forecasts by so called scoring rules.

For forecasting general multivariate distributions, however, there are only a very few scoring rules that are considered in the literature.

In their fundamental paper, Gneiting and Raftery (2007) considered the so called energy score as an example of a scoring rule that is strictly proper for arbitrary multivariate distributions. Pinson and Tastu (2013) started a debate on the discrimination ability of this scoring rule with respect to the dependence structure. In this talk I want to contribute to this discussion by deriving dependence uncertainty bounds for the energy score and the related multivariate Gini mean difference.

This means that we derive bounds for the score under the assumption that we only know the marginals of the distributions, but do not know anything about the dependence structure, i.e. the copula. We will derive some analytical bounds that are sharp in some cases. In other cases we will derive interesting numerical bounds by using a variant of a swapping algorithm. It turns out that some of these bounds are attained for some non-standard copulas that are of interest in their own right.

Education:

- Diploma Studies in Mathematics and Business Science (Wirtschaftsmathematik), University of Karlsruhe, Germany, 1986-1991, Thesis: Bayes-Modelle für sequentielle Verkaufsprobleme (Bayesian models for sequential asset selling problems). Supervisor: Prof. Hinderer
- Ph.D. in Mathematics, University of Karlsruhe, Germany, Februar 1995, Dissertation: Integralindizierte Ordnungen und Metriken auf Mengen von Wahrscheinlichkeitsmaßen mit Anwendungen bei Markoffschen Entscheidungsprozessen. (Stochastic Orders and Probability metrics generated by integrals: with applications to Markov Decision Processes). Supervisor: Prof. Hinderer
- Habilitation, University of Karlsruhe, Jan. 2000, Thesis: Stochastic orders and the comparison of size, variability and dependency of risks.

Positions:

- Oct. 1988 - Sept. 1991, Teaching Assistant, University of Karlsruhe
- Oct. 1991 - Sept. 1995, Research Assistant, University of Karlsruhe
- Oct. 1995 - Sept. 2000, Lecturer (wiss. Assistent (C1)), University of Karlsruhe
- Oct. 2000 - Sept. 2006, Reader (Hochschuldozent (C2)), University of Karlsruhe
- Oct. 2006 - March 2007, Temporary Professor (Vertretungsprofessur), Department Mathematik, University of Siegen

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- April 2007 - March 2008, Senior Lecturer, Department Actuarial Science and Statistics Heriot-Warr University, Edinburgh, UK
 - April 2008 - today, Professor, Department Mathematik, University of Siegen

Main Research Interests:

Stochastic order relations and modelling dependence, theory of copulas and Lévy copulas, actuarial and financial mathematics, stochastic models for electricity markets and electricity derivatives, stochastic models for sea level and flood data, risk measures, Markov decision processes, optimal stopping problems, decisions under risk and uncertainty

Dr. Peter Hieber

„Retirement products and subjective mortality beliefs“ (joint with An Chen and Manuel Rach)

This talk first gives an overview of different retirement products and their way of sharing mortality risks. We, in detail, look at conventional annuities (insurance provider takes the mortality risk) and tontines (a pool of policyholders shares the mortality risk). Next, we discuss the fairness of such products from the insurer's perspective and compare this to the perceived attractiveness of an insured. We take into account empirical studies that confirm that individual's subjective mortality beliefs deviate from the information given by publicly available mortality tables.

In an actuarially fair world without subjective beliefs, policyholders always prefer a secure annuity payoff to a tontine (Yaari [1965]). We show that subjective mortality beliefs can easily reverse this result, that is tontine products are perceived more attractive than annuities.

Since July 2014, Dr. Hieber is a PostDoc researcher at the Institute of Insurance Science at Ulm University (Prof. Dr. An Chen). In between he was also PostDoc at Université Catholique de Louvain (Prof. Pierre Devolder, Prof. Griselda Deelstra) and had a professorship (W2) "Risk and Insurance" at TU Munich. Since October 2019 he participates at DAAD-Prime Research Fellowship Université Catholique de Louvain, Belgium.

His research is in Mathematical Finance and Actuarial Science. He works on:

- the risk management, pricing and hedging of financial derivatives and insurance contracts
- optimal, innovative (insurance) contract design, utility maximization, optimal control and optimal asset allocation
- dependence modeling and efficient numerical routines
- the analysis of risk sharing concepts in finance and insurance.