DGVFM-Workshop für junge Mathematiker
Wissenschaftszentrum Schloss Reisensburg
28. bis 30. November 2022

Montag, 28.11.2022

Anreise ab 14:00 Uhr möglich

15:00 – 16:00 Uhr	*Kaffee und Kuchen*
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. Michael Kochanski (SV SparkassenVersicherung Lebensversicherung AG) **„Asset Liability Management for a non-insurance-based pension fund? Surprisingly different"**
18:30 Uhr	*Abendessen*

Dienstag, 29.11.2022

08:30 - 09:15 Uhr	*Frühstück*
09:30 - 10:45 Uhr	Prof. Dr. Elena Vigna (University of Turin, Italy) **„Mean-variance dynamic optimality for DC pension schemes"**
10:45 – 12:00 Uhr	Prof. Dr. Christoph Belak (Technical University of Berlin) **„Computational Methods for High-Dimensional PDEs"**
12:30 – 13:30 Uhr	*Mittagessen*
14:00 – 15:15 Uhr	Prof. Dr. Pierre Devolder (UC Louvain, Belgium) **„How to model, evaluate and manage uncertainties in life insurance"**
15:15 – 15.45 Uhr	*Kaffeepause*
15:45 – 17:00 Uhr	Uwe Michel (Allianz SE Munich) **„Allianz in Asia"**
18:30 Uhr	*Abendessen*

Mittwoch, 30.11.2022

08:30 - 09:15 Uhr   *Frühstück*

09:30 – 10:45 Uhr   Prof. Dr. Steven Vanduffel
                          (Vrije Universiteit Brussel (VUB), Belgium)
                          „A Quantitative Approach to Model Risk Management"

10:45 – 12:00 Uhr   Prof. Dr. Rüdiger Kiesel (University of Duisburg-Essen)
                          „Carbon Finance"

12:00 – 12:15 Uhr   Abschlussrunde, Evaluation

12:30 Uhr   *Mittagessen*

14:00 Uhr   *Ende der Veranstaltung*

Vorträge / Referent*innen

Dr. Michael Kochanski
„Asset Liability Management for a non-insurance-based pension fund? Surprisingly different!"

Due to the ever-increasing life expectancy and insufficient financing, the statutory pension system is reaching its limits. Occupational pension schemes are regarded as a reliable addition offsetting some of the shortcomings. Unfortunately, many years of ultra-low interest rates created significant burden within the balance sheets of many employers, now seeking to untie themselves from the accompanying financial and operational strains. A non-insurance-based pension fund allows for a transfer of the past service of the pension scheme paying a single premium into the pension fund. In the case of the fund assets falling below the minimum provision, the employer must make additional contributions to fill this gap. Therefore, the Asset-Liability Management (ALM) of a non-insurance-based pension fund targets entirely different aims compared to traditional life insurance. In the presentation, we will recap the basic concepts of ALM in life insurance, discuss relevant differences in the regulatory setup of life insurance vs. non-insurance-based pension funds and motivate a diverging ALM approach.

Short Bio:

- Gruppenleiter Aktuarielles Controlling (LM42), SV SparkassenVersicherung Lebensversicherung AG
- since 2012 at the Württembergische Lebensversicherung AG, Actuarial Controlling
- 2008-2012 PhD-Student in the DFG research training group 1100, University of Ulm
- 2008 Diploma in Economics
- 2002-2008 Ruprecht-Karls-University of Heidelberg - Studies in Mathematics and Economics
- 2007 Master of Science (Mathematics - Actuarial Science)
- 2006-2007 University of Connecticut

Main Research Interests:

Solvenzkapitalberechnung für fondsgebundene LV-Produkte, Dynamisches Storno, Solvency II

Prof. 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.

Short Bio:

Elena Vigna, born in 1970, is full professor in Mathematical Methods for Economics and Actuarial and Financial Sciences at Università degli Studi di Torino. Since 2016 she is Director of the Master Degree in Quantitative Finance and Insurance of Università di Torino. Her main research interests lie in the Insurance field, ranging from optimal decision making in defined contribution pension schemes to stochastic mortality modelling. More recent research focuses on portfolio selection problems for time inconsistent problems.

Main Research Interests: Actuarial Science, Portfolio Selection

Prof. Christoph Belak
„Computational Methods for High-Dimensional PDEs"

Recent years have brought about several numerical methods to compute solutions of certain classes of high-dimensional partial differential equations arising, e.g., in the context of option pricing and optimal investment. In this talk, I will give an introduction to two particular approaches which are, respectively, based on deep neural network approximations and, if time permits, branching diffusion representations. In particular, we analyze under which conditions convergence of these approaches can be guaranteed, discuss their advantages and disadvantages as well as their feasability in financial applications, and give an overview of open problems.

Short Bio:

Christoph Belak is a Junior Professor at Technische Universität Berlin in the field of Stochastics and Quantitative Financial Mathematics. His main research interests are in stochastic control with applications to finance, in particular in the context of optimal investment under transaction costs, probabilistic representations and viscosity solutions of partial differential equations, and applications of machine learning methods for problems arising in finance.

Prof. Pierre Devolder
„How to model, evaluate and manage uncertainties in life insurance"

Insurance is by essence a field based on uncertainties, where the valuation and the management of risks are central topics. Not surprisingly, probability theory and stochastic processes are daily used to model cash flows. However, there are different kinds of uncertainties influencing insurance processes. In this presentation, we will focus on life insurance and present three fundamental sources of risk: financial risks, diversifiable mortality risks and non-diversifiable mortality risks. We will show that the intrinsic logic of these different uncertainties is very different for the insurer. Therefore, the valuation and the management of these risks could be based on specific tools and different axiomatics. We will illustrate the topic with simple binomial models, suggest analogies with games and present a general three step model able to disentangle the pricing and the management of these various uncertainties.

Short Bio:

Pierre DEVOLDER is professor of mathematical finance and actuarial science at the Catholic University of Louvain (UCL). He has a PhD in mathematics from the University of Brussels and is actuary, member of the Belgian Institute of actuaries (IABE). His main research activities are focused on stochastic finance, life insurance and pension theory.
He has published 8 books and more than 70 scientific papers in various actuarial and finance journals. He gives regular courses at the universities of Strasbourg, Lyon and Rabat. He is also partner of the actuarial consulting company REACFIN. He has been member of governmental commissions of reform of pension in Belgium.

Uwe Michel
„Allianz in Asia"

Since the mid-90s Allianz has been intensifying its activities in Asia in the business lines life insurance, non-life insurance and asset management. Nowadays Allianz is present in 11 countries in Asia with an overall profit of over 500 million EUR. The presentation will describe Allianz´ development and its strategy in these markets going forward.

Short Bio:

Uwe Michel, Executive Vice President, is the Head of Business Division Asia at Allianz SE Munich. Uwe joined Allianz in 1994 and has held various senior roles, including Head of M&A in Singapore, Country Head of Allianz SE in Japan and CEO of Allianz Indonesia. He serves as a Board Member in Allianz (China) Insurance Holding Company Limited, Allianz China Life Co., Ltd., and Allianz JingDong General Insurance Co. Ltd.. Prior to joining Allianz, Uwe worked at Linklaters in London and Munich.

Uwe has completed legal studies at the Universities of Tübingen, Munich, and Geneva (equivalent to JD). Uwe is a licensed lawyer (Rechtsanwalt) in Germany, and has been admitted to the Higher Regional Court in Munich as an Attorney at Law. Furthermore, he holds an LLM from University College, Dublin, as well as an AMP from INSEAD, Fontainebleau, and IESE, Barcelona.
Uwe holds various directorships in Germany and Asia. He lectures as Extraordinary Professor at Southwestern University of Finance and Economics (SWUFE), Chengdu, China.

Prof. Steven Vanduffel
„A Quantitative Approach to Model Risk Management"

Banks hold large portfolios of risky loans and insurers are exposed to risk factors such as longevity risk, non-life risk (e.g., because of climate change), interest rate risk, operational risk… Materialization of these risks can jeopardize the existence of the bank or insurance company at hand and may even cause tremendous financial trouble for taxpayers, as they might be required to feed the bill in the case of a default.

To assess the risk of a portfolio, and to make decisions on solvency requirements, pricing of products…., one typically attempts to measure the risk of a sum $S=X\_1+X\_2+\cdots+X\_n$, in which the individual risks X_i depict losses (e.g., on loans), using a risk measure such as the variance, the Value-at-Risk (VaR) or the Tail Value-at-Risk1 (TVaR). It is clear that solving this problem is mainly a numerical issue once the joint distribution (i.e., the model) of the portfolio 〖(X〗_1,X_2,…,X_n) is completely specified. Estimating such joint distribution or testing its adequacy is however a very difficult task. Therefore, the values of the risk measure one obtains are merely best estimates that are prone to error.

In this talk we provide a high-level discussion of some approaches that aim to quantitatively assess the model risk of portfolios in the sense that we aim to assess the extent by which the best estimates

of a risk measure can be wrong. We highlight herein the role of mathematical concepts and tools coming from the fields of probability, mathematical statistics and algebra.

Short Bio:

Steven Vanduffel is a professor in Finance and Insurance at Solvay Business School (Brussels). His research topics pertain to the fields of insurance and financial mathematics/economics. He has published his research results in journals such as the Journal of Risk and Insurance, the Journal of Mathematical Economics, the Journal of Applied Probability, and Finance and Stochastics, amongst others. He was awarded the Robert I. Mehr Award (2022), the Robert C. Witt Award (2018), the Redington Prize (2015), the PRMIA Award for new frontiers in Risk Management (2014), the Johan de Witt Prize (2012), the SCOR-EGRIE Young Economist Best Paper Award (2011), and the Lloyds Science of Risk Prize (2011). He is a member of the editorial board of Astin Bulletin as well as an associate editor with European Actuarial Journal and Dependence Modeling.

Prof. Rüdiger Kiesel
„Carbon Finance"

By now it is widely agreed that climate change poses a substantial risk to financial markets.

We classify risks as tolerable and non-tolerable to discuss risk management strategies in this context. We show how a pre-commitment approach might be used in this context. Utilizing our general framework, we turn to several specific examples relating to the measurements of risks in credit markets and concerning net-zero commitments.

The talk relies on joint work with Gerhard Stahl, (HDI), Andrej Bajic (Deloitte FSI-Audit-Garage), Alexander Blasberg and Kateryna Chekriy (both University Duisburg-Essen).

Short Bio:

Rüdiger Kiesel heads the chair for "Energy Trading and Financial Services" and is Executive Director of the "House of Energy Markets and Finance" at the University Duisburg-Essen. Previously he has been Director of the Institute for Mathematical Finance at the University of Ulm. He also held positions for actuarial science and financial mathematics at Birkbeck College, University of London, the London School of Economics (full-time and visiting), and the Department of Mathematics at the University of Oslo (as a Visiting Professor). He is member of the board of several academic associations. His main research areas are quantitative climate finance, modeling of electricity markets, valuation and hedging of derivatives (interest-rate, credit- and energy-related), risk management for financial and energy-related institutions, and methods of risk transfer and structuring of risk (securitization). He is Co-author of the monographs "Carbon Finance", "Risk-Neutral Valuation" and has written more than seventy published research papers. He is a frequent speaker at international conferences and organized several conferences, summer schools, and practitioner seminars. Professor Kiesel also consults financial institutions, utilities and regulators on (carbon, credit- and energy-) risk management, derivative pricing models and asset allocation.

Main Research Interests:

His main research areas are the risk management for power utility companies, bank, and insurance companies, modeling of electricity markets, valuation and hedging of derivatives (interest-rate, credit- and energy-related), optimal portfolio allocation under frictions.