

LMU

LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN

MRIC | MUNICH RISK AND
INSURANCE CENTER

MRIC ANNUAL REPORT 2021



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1. GOVERNANCE OF THE MUNICH RISK AND INSURANCE CENTER

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Dr. Robert Heene (Versicherungskammer Bayern)
Dr. Doris Höpke (Munich Re)
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Vincenzo Reina (Generali Deutschland AG)
Wolfgang Reichel (Lebensversicherung von 1871 a. G. München)
apl. Prof. Dr. Jochen Ruß (Institut für Finanz- und Aktuarwissenschaften – Gesellschaft für Finanz- und Aktuarwissenschaften mbH)
Dr. Herbert Schneidemann (die Bayerische)

EXECUTIVE BOARD

Prof. Dr. jur. Thomas Ackermann, LL.M. (Cambridge) (Chair for Civil Law, European and International Business Law)
Prof. Dr. Francesca Biagini (Workgroup in Financial and Insurance Mathematics)
Prof. Dr. Johannes Jaspersen (Professorship for Behavioral Risk Management and Insurance)
Prof. Dr. Andreas Richter (Institute for Risk Management and Insurance)
Dr. Stephanie Müller (Institute for Risk Management and Insurance)

PROGRAM COORDINATOR

Dr. Stephanie Müller (Institute for Risk Management and Insurance)

2. MEMBERS OF THE MUNICH RISK AND INSURANCE CENTER

PROFESSORS AT LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Prof. Dr. jur. Thomas Ackermann, LL.M. (Cambridge) (Chair for Civil Law, European and International Business Law)
Prof. Dr. Francesca Biagini (Workgroup in Financial and Insurance Mathematics)
Prof. Dr. Ralf Elsas (Institute for Finance and Banking)
Prof. Dr. Florian Englmaier (Chair of Organizational Economics)
Prof. Dr. Christian Fries (Workgroup in Financial and Insurance Mathematics)
Prof. Dr. Markus Glaser (Institute for Capital Markets and Corporate Finance)
Prof. Dr. Thomas Hess (Institute for Information Systems and New Media)
Prof. Dr. Johannes Jaspersen (Professorship for Behavioral Risk Management and Insurance)
Prof. Dr. Reiner Leidl (Institute for Health Economics and Health Care Management)
Prof. Dr. Thilo Meyer-Brandis (Workgroup in Financial and Insurance Mathematics)
Prof. Stefan Mitnik, Ph.D. (Seminar for Financial Econometrics)
Prof. Dr. Ari-Pekka Perkkiö (Workgroup in Financial and Insurance Mathematics)
Prof. Dr. Andreas Richter (Institute for Risk Management and Insurance)
Prof. Dr. Simeon Schudy (Chair for Behavioral and Experimental Economics)
Prof. Dr. Manfred Schwaiger (Institute for Market-Based Management)

RESEARCH ASSISTANTS AND POST-DOCS

Lorenzo Berti, M.Sc. (Workgroup in Financial and Insurance Mathematics)
Georg Bollweg, M.Sc. (Workgroup in Financial and Insurance Mathematics)
Boris Dubov (Chair for Civil Law, European and International Business Law)
Eva Fischer (Chair for Civil Law, European and International Business Law)
Julia Holzapfel, M.Sc. (Institute for Risk Management and Insurance)
Dr. Alexander Kalinin (Workgroup in Financial and Insurance Mathematics)
Leonard Külpp, B.Sc. (Institute for Risk Management and Insurance)
Dr. Andrea Mazzon (Workgroup in Financial and Insurance Mathematics)
Dr. Stephanie Müller (Institute for Risk Management and Insurance)
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Roxane Steinacker, M.Sc. (Institute for Risk Management and Insurance)
Elisabeth Stöckl, M.Sc. (Institute for Risk Management and Insurance)
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Sandra Zoller, M.Sc. (Institute for Risk Management and Insurance)

2. MEMBERS OF THE MUNICH RISK AND INSURANCE CENTER

ASSOCIATED MEMBERS

Dr. Nikolaos Argyris (Loughborough University)
Michael Aschenbrenner (Ludwig-Maximilians-Universität München)
Dr. Vijay Aseervatham (Swiss Re)
Dr. Klaus Bender (Swiss Re)
Prof. Dr. Enrico Biffis (Imperial College London)
Prof. Patricia Born, Ph.D. (Florida State University)
Prof. Mark Browne, Ph.D. (St. John's University)
Prof. Richard J. Butler, Ph.D. (Global Center for Longevity Risk Management at SWUFE)
Prof. Randy Dumm, Ph.D. (Temple University)
Prof. Louis Eeckhoudt, Ph.D. (IÉSEG School of Management and C.O.R.E.)
Prof. (em.) Dr. Dr. h.c. Roland Eisen (Goethe University Frankfurt am Main)
Dr. Tobias Gerstner (EY)
Dr. Michael Hanselmann (TU München)
Karl Happe (Allianz Global Investors)
Prof. Dr. Thomas Hartung (Universität der Bundeswehr München)
Markus Huber, MBR (Ludwig-Maximilians-Universität München)
Dr. Tobias Huber (Allianz)
Dr. Bernd Jäger (Allianz SE)
Dr. Verena Jäger (Allianz Global Investors)
Dipl.-Math. Pierre Joos (v3 consulting GmbH)
Dr. Barbara Klimaszewski-Blettner (HDI Global SE)
Dr. Alexander Kling (Institut für Finanz- und Aktuarwissenschaften – Gesellschaft für Finanz- und Aktuarwissenschaften mbH)
Dr. Christian Knoller (Allianz SE)
Prof. Dr. Martin Kocher (Federal Minister of Labor Austria)
Dr. Gunther Kraut (Munich Re)
Dr. Andreas Kunz (Munich Re)
Dr. Alex Langnau (Allianz SE)
Dr. Christoph Lex (Munich Re)
Dr. Lu Li (Munich Re)
Dr. Peter Liebwein (Swiss Re)
Dr. Dominik Lohmaier (Versicherungskammer Bayern)
Prof. Richard MacMinn, Ph.D. (National Chengchi University)
Prof. Dr. Edgar Neuburger (Institut für Wirtschaftsmathematik und betriebliche Altersversorgung GmbH)
Dr. Stefan Neuß (Diözese Passau)
Dr. Laila Neuthor (we4 Impact GmbH)

2. MEMBERS OF THE MUNICH RISK AND INSURANCE CENTER

Dr. Peter Ott (EY)
Prof. Dr. Richard Peter (University of Iowa)
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Prof. Marc A. Ragin, Ph.D. (University of Georgia)
Dr. Paul Raschky (Monash University)
Prof. (em.) Ray Rees, Ph.D. (Ludwig-Maximilians-Universität München)
Prof. (em.) Dr. Wolfgang Runggaldier (University of Padova)
Dr. Rainer Sachs (Munich Re)
Prof. Dr. Jörg Schiller (Universität Hohenheim)
Dr. Herbert Schmidt (riva training & consulting GmbH)
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PD Dr. Günther Schwarz (Munich Re)
Dr. Sebastian Soika (Munich Re)
Prof. Dr. Petra Steinorth (Universität Hamburg)
Dr. Sebastian Strasser (Swiss Re)
Dr. Dennis Strümpel (ShoulderByte GmbH)
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Brandon Sweitzer (St. John's University)
Prof. Paul Thistle, Ph.D. (University of Nevada, Las Vegas)
Dr. Frederik Weber (Munich Re)
Hon.-Prof. Thomas C. Wilson, Ph.D. (Allianz Ayudhya)
Dr. Michael Wolgast (Berlin Global Advisors)
Dr. Ferdinand Zahn (Munich Re)
Prof. Dr. Aihua Zhang (University of Leicester)

3. PERSONNEL

The following persons worked at the institutes that are part of the Munich Risk and Insurance Center during the reporting period:

3.1

PERSONNEL AT THE INSTITUTE FOR RISK MANAGEMENT AND INSURANCE

PROFESSORS

Prof. Dr. Andreas Richter

Hon.-Prof. Thomas C. Wilson, Ph.D

POST-DOCS

Dr. Lu Li

Dr. Stephanie Müller

RESEARCH ASSISTANTS

Julia Holzapfel, M.Sc.

Leonard Külpp, B.Sc.

Roxane Steinacker, M.Sc.

Elisabeth Stöckl, M.Sc.

Sandra Zoller, M.Sc.

OTHER DOCTORAL CANDIDATES

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Markus Huber, MBR

Dipl.-Math. Pierre Joos

ADMINISTRATIVE STAFF

Joëlle Näger

LECTURERS

Dr. Klaus Bender (Swiss Re)

Prof. Patricia Born, Ph.D. (Florida State University)

3. PERSONNEL

Prof. Oliver Brand, LL.M. (Universität Mannheim)
Prof. Dr. Ralf Elsas (Ludwig-Maximilians-Universität München)
Dr. Florian Gallasch (Munich Re)
Emilio Galli Zugaro (Methodos S.p.A. und Orvieto Academy)
Prof. Dr. Dietmar Harhoff (Max-Planck-Institut für Innovation und Wettbewerb)
Prof. Dr. Thomas Hartung (Universität der Bundeswehr München)
Prof. Dr. Thomas Hess (Ludwig-Maximilians-Universität München)
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Prof. Dr. Tobias Kretschmer (Ludwig-Maximilians-Universität München)
Dr. Peter Liebwein (Swiss Re)
Prof. Dr. Stefan Mittnik (Ludwig-Maximilians-Universität München)
Dr. Joachim Rawolle (Capgemini)
Dr. Manfred Reichl (MR Advisory)
Dr. Andreas Reuß (Institut für Finanz- und Aktuarwissenschaften – Gesellschaft für Finanz- und Aktuarwissenschaften mbH)
apl. Prof. Dr. Jochen Ruß (Institut für Finanz- und Aktuarwissenschaften – Gesellschaft für Finanz- und Aktuarwissenschaften mbH)
Prof. Dr. Jörg Schiller (Universität Hohenheim)
Dr. Herbert Schmidt (Berufsbildungswerk der Versicherungswirtschaft in München e.V. and riva training & consulting GmbH)
Prof. Dr. Manfred Schwaiger (Ludwig-Maximilians-Universität München)
Hon.-Prof. Thomas C. Wilson, Ph.D. (Allianz Ayudhya)
Mag. Iris Zeppezauer (Sekunde Eins e.U.)

STUDENT ASSISTANTS

Jialing Lin
Lena Lorenz
Kerry McCabe
Leon Roth
Vasilena Vasileva
Melisa Yilmaz

3. PERSONNEL

3.2

PERSONNEL AT THE WORKGROUP IN FINANCIAL MATHEMATICS

PROFESSORS

Prof. Dr. Francesca Biagini
PD Dr. Dirk Deckert
Prof. Dr. Christian Fries
Prof. Dr. Lukas Gonon
Prof. Dr. Thilo Meyer-Brandis
Prof. Dr. Ari-Pekka Perkkiö

POST-DOCS

Dr. Alexander Kalinin
Dr. Andrea Mazzon

OTHER DOCTORAL CANDIDATES

Roland Bachl, M.Sc.
Lorenzo Berti, M.Sc.
Georg Bollweg, M.Sc.
Annika Steibel, M.Sc.
Niklas Walter, M.Sc.

ADMINISTRATIVE STAFF

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Dr. Günter Schwarz (Munich Re)
Dr. Christoph Wagner (EY)

3. PERSONNEL

3.3

PERSONNEL AT THE CHAIR OF PRIVATE LAW, EUROPEAN AND INTERNATIONAL COMMERCIAL LAW

PROFESSOR

Prof. Dr. Thomas Ackermann, LL.M. (Cambridge)

RESEARCH ASSISTANTS

Boris Dubov

Eva Fischer

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Yannick Skowronek

Severin Uhsler

ADMINISTRATIVE STAFF

Elke Kälin

STUDENT ASSISTANTS

Luca Giehl

Jonathan Knospe

Sophie Zäuner

3.4

PERSONNEL AT THE PROFESSORSHIP FOR BEHAVIORAL RISK MANAGEMENT AND INSURANCE

PROFESSOR

Prof. Dr. Johannes Jaspersen

RESEARCH ASSISTANTS

Andreas Dambaur, M.Sc.

4. COURSES

4.1

COURSES AT THE INSTITUTE FOR RISK MANAGEMENT AND INSURANCE

SUMMER TERM 2021

BACHELOR OF SCIENCE:

Risiko und Versicherung (Richter)

Tutorial for Risiko und Versicherung (Zoller)

Versicherungsbilanzen (Knoller)

Tutorial for Versicherungsbilanzen (Stöckl)

Praxis der PR: Communicative Leadership (Galli Zugaro)

Hauptseminar: Behavioral Risk Management and Insurance (Richter, Li)

MASTER OF SCIENCE:

Insurance Economics (Jaspersen)

Tutorial for Insurance Economics (Holzapfel)

Reinsurance (Liebwein)

Projektkurs: Versicherungsmanagement (Müller)

Value-Based Management of Financial Institutions (Wilson)

MASTER OF BUSINESS RESEARCH:

Microeconomic Modeling Methods (Peter)

ADDITIONAL SEMINARS:

Open research seminar series "Risk and Microeconomics Research Seminar" (Richter)

Risk & Insurance Research Seminar Series (Richter)

Vertiefungskolloquium (Holzapfel, Li, Müller, Richter, Steinacker, Stöckl, Zoller)

EXECUTIVE MASTER OF INSURANCE:

Corporate Finance (Elsas)

Current Trends in Finance and Insurance (Hartung)

Data Analysis (Mittnik)

Insurance Accounting (Gallasch, Knoller)

Value-Based Management of Insurance Companies (Wilson)

4. COURSES

WINTER TERM 2021/2022

BACHELOR OF SCIENCE:

Insurance Management (Müller)
Tutorial for Insurance Management (Müller)
Investition und Finanzierung (Richter)
Tutorial for Investition und Finanzierung (Holzapfel, Külpp, Stöckl, Zoller)
Praxis der PR: Communicative Leadership (Galli Zugaro)
BWL in Theorie und Praxis – Ringvorlesung (Richter)
Hauptseminar: Information and Insurance (Richter, Stöckl)
Seminar: Catastrophe Risk Management (Born)

MASTER OF SCIENCE:

Advanced Risk Management (Richter)
Tutorial for Advanced Risk Management (Holzapfel)
Projektkurs: Versicherungsmanagement (Müller)
Proseminar: Aktuelle Entwicklungen in der Altersvorsorge (Kling)

ADDITIONAL SEMINARS:

Open research seminar series “Risk and Microeconomics Research Seminar” (Richter)
Risk & Insurance Research Seminar (Richter)
Vertiefungskolloquium (Holzapfel, Müller, Richter, Stöckl, Zoller)

EXECUTIVE MASTER OF INSURANCE:

Business Models and Current Challenges (Müller, Zeppezauer)
Corporate Governance (Reichl)
Digital Transformation in the Insurance Industry (Hess, Rawolle)
General Business Administration (Hartung, Schiller)
General Economics (Harhoff, Kocher, Kretschmer)
Insurance Accounting (Gallasch, Knoller)
Insurance Management and Economics – Principles (Richter)
Insurance Marketing (Schwaiger)
Law and Regulation (Brand, Schiller)
Management Simulation Game (Klotzbücher, Schmidt)
Mathematics Preparatory Course (Knoller)
Quantitative Methods (Knoller)
Risk Management (Bender)
Risk Theory (Knoller)
Seminar: Insurance Research Projects (Richter)

4. COURSES

4.2

COURSES AT THE WORKGROUP IN FINANCIAL MATHEMATICS

SUMMER TERM 2021

BACHELOR FINANCIAL MATHEMATICS:

Angewandte Finanzmathematik (Perkkiö)

MASTER FINANCIAL MATHEMATICS:

Financial Modelling with Stochastic Partial Differential Equations (Kalinin)

Finanzmathematik III / Fixed Income Markets and Credit Derivates (Meyer-Brandis, Steibel)

Finanzmathematik IV / Quantitative Risk Management (Gonon, Walter)

Intensive Course on Financial Simulation (Akhtari)

Mathematic(al Statistic)s and Application of Machine Learning (Deckert)

Numerical Methods for Financial Mathematics (Fries, Mazzon, Bachl)

ADDITIONAL COURSES:

Forschungsseminar Finanzmathematik (Meyer-Brandis)

Pricing and Hedging Techniques in Incomplete Markets: Mean-Variance Hedging and Risk Minimization (Zhang)

Topics in Machine Learning and Mathematical Finance (Gonon)

Versicherungsmathematisches Kolloquium (Biagini, Brechmann, Feilmeier, Meyer-Brandis, Schneemeier, Schiller, Zsohar)

WINTER TERM 2021/2022

BACHELOR FINANCIAL MATHEMATICS:

Finanzmathematik in diskreter Zeit (Gonon, Reitsam)

MASTER FINANCIAL MATHEMATICS:

Computational Finance and its Object Oriented Implementation (with Application to Interest-Rates and Hybrid Models) (Fries, Mazzon, Berti)

Computational Finance and Its Implementation in Python With Applications to Option Pricing, Green Finance And Climate Risk (Mazzon)

Finanzmathematik II / Stochastic Calculus and Arbitrage Theory in Continuous Time (Meyer-Brandis, Steibel)

Öffentliches Finanzmarktrecht (Kaufhold)

Personenversicherungsmathematik (Lenckner, Meindl, Schwarz)

Schadensversicherungsmathematik (Riegel)

4. COURSES

ADDITIONAL COURSES:

Advanced Techniques in Machine Learning for Mathematical Finance (Gonon)

Credit Risk Modelling (Zhang)

Forschungsseminar Finanzmathematik (Meyer-Brandis)

Versicherungsmathematisches Kolloquium (Biagini, Brechmann, Feilmeier, Meyer-Brandis, Schneemeier, Schiller, Zsohar)

4.3

COURSES AT THE PROFESSORSHIP FOR BEHAVIORAL RISK MANAGEMENT AND INSURANCE

SUMMER TERM 2021

BACHELOR OF SCIENCE:

Entscheidungen unter Risiko (Jaspersen)

Tutorial for Entscheidungen unter Risiko (Dambaur)

Verhaltenswissenschaft in Risiko und Versicherung (Jaspersen, Dambaur)

MASTER OF BUSINESS RESEARCH:

Experimental Methods (Jaspersen)

Basic Readings in Accounting and Finance (Jaspersen)

WINTER TERM 2021/2022

BACHELOR OF SCIENCE:

Behavioral Aspects of Risk Management and Insurance (Jaspersen, Dambaur)

MASTER OF BUSINESS RESEARCH:

Experimental Methods (Jaspersen)

Readings in Finance and Insurance (Jaspersen)

5. COMPLETED DOCTORAL PROJECTS

Thomas Reitsam:

Asset Price Bubbles and Dynamic Super-Replication under Transaction Costs

Roxane Steinacker:

Essays on Moral Hazard in Health Insurance and Agricultural Insurance

Dennis Strümpel:

Essays on Risk Management and Insurance Economics

6. COMPLETED MASTER THESES (EXECUTIVE MASTER OF INSURANCE)

Alternativer Risikotransfer in der Rückversicherung: Was ist Notwendig, Damit Auch Private Investoren in Cat Bonds Investieren Können?

Do the IFRS 17 Unit of Account Requirements Comply With Fundamental Principles of Insurance?

Is German Midwife Liability Insurance in Crisis? An International Comparison

On the Effectiveness of Insurance Distribution in Uganda

7. FINAL THESES

7.1

FINAL THESES AT THE INSTITUTE FOR RISK MANAGEMENT AND INSURANCE

COMPLETED BACHELOR THESES:

Adverse Selection in Automobile Insurance Markets
 An Evaluation of Parametric Insurance
 An International Comparison of Health Insurance Concepts
 Asymmetric Information in Disability Insurance
 Behavioral Biases in the Management of Extreme Event Risks – Are Natural Catastrophes and Pandemics Two Sides of the Same Coin?
 Combating Moral Hazard Through Bonus-Malus Systems
 Do CEOs Matter? On CEO Characteristics and Corporate Policies
 Elicitation of Risk Preferences
 Equilibrium Concepts in Insurance Markets With Adverse Selection: Theory and Empirics
 Estimating Risk Preferences from Insurance Choices
 Incentivizing Healthy Behaviour
 Increasing Company Value Through Enterprise Risk Management
 Moral Hazard in Liability Insurance
 On the Optimal Choice Between Prevention and Cure
 On the Reduction of External Moral Hazard
 Privacy Concerns in Insurance Markets
 Public-Private Partnerships: A Means of Making Pandemic Risks Insurable?
 Recent Trends in Life Reinsurance
 Risk Classification – What's Next?
 Risk Perception and Insurance Demand
 Risk Preferences when Deciding for Others
 Saving = Investing? The Determinants of Stock Market Participation
 Selection in Insurance Markets: A Comparison Between Life Insurance and Annuities
 The Demand for Insurance – A Comparison Between Expected Utility Theory and Regret Theory
 The Design of Area-Based Crop Insurance
 The Determinants of Heterogeneous Risk Preferences
 The Determinants of Life Insurance Demand
 The Impact of Machine Learning on Insurance Fraud Detection
 The Impact of the Demographic Change on the Insurance Industry
 The Newsvendor Problem: Theory and Evidence
 The Securitization of Extreme Event Risks
 Verpflichtende Flutversicherung – Eine Kritische Analyse

7. FINAL THESES

COMPLETED MASTER THESES:

Information Unraveling in the Case of German Universities

On the Impact of Enterprise Risk Management: Measuring ERM's Impact on Firm Performance With an ERM Index

On the Interaction between Crop Yields and Weather

Quantifying Information in Risk Management Decisions

Study of an Experimental Test on Insurance Demand

Sustainability in the Insurance Industry – A Situation Analysis

The Influence of Financial Literacy on Insurance Fraud

The U.S. Federal Crop Insurance Program and Information Asymmetries: Theoretical and Empirical Studies

Willingness to Pay For Morbidity and Mortality Risk Reductions During the COVID-19 Pandemic

Zur Bedeutung von Zusatzleistungen in der Privaten Krankenversicherung – Eine Experimentelle Untersuchung

MASTER THESES IN PROGRESS:

The Impact of Regret on Insurance Fraud

Intertemporal Prevention Decisions With Multiple Risks

7. FINAL THESES

7.2

FINAL THESES AT THE WORKGROUP IN FINANCIAL AND INSURANCE MATHEMATICS

COMPLETED BACHELOR THESES:

A Conditional Version of the Second Fundamental Theorem of Asset Pricing in Discrete Time
 A Discrete Time Benchmark Approach for Insurance and Finance
 A Model-Free Version of the Fundamental
 Arbitrage Concept Under Trading Restrictions In Discrete-Time Financial Markets
 Bankenübergreifende Portfolio-Diversifikation
 Die Implizite Volatilitätsoberfläche Bewegt Sich Nicht Durch Parallelverschiebungen
 Environmental Impact Investing
 Fair Valuation of Insurance Liabilities via Mean-Variance Hedging in a Multi-Period Setting
 Marktkonsistente Preisgestaltung von Versicherungsprodukten
 Model-Independent Bounds for Option Prices: a Mass Transport Approach
 Modelling Liquidity Effects in Discrete Time
 Monte Carlo Simulation: Importance Sampling and Stratified Sampling With Application to Options
 Nutzenmaximierung unter Modellunsicherheit in Diskreter Zeit
 Portfolio-Optimierung Unter der Beschränkung des Maximalen Wertverlusts
 Portfolio Optimization in Discrete Time
 Pricing American Options with the Finite Difference Method
 Risk Measures and Capital Requirements for Processes
 Simulating the Heston Stochastic Volatility Model
 Solving Optimal Stopping Problems Using a Deep Learning Method
 The Impact of Longevity and Investment Risk on a Portfolio of Life Insurance Liabilities
 The Optimal Design of Participating Life Insurance Contracts

COMPLETED MASTER THESES:

An SPDE Model for Systemic Risk With Endogenous Contagion
 Arbitrage Theory on Large Platonic Markets With Delays
 A Review of Interest Rate Modeling and Discounting in the Context of Climate Models
 Asset Price Bubbles Induced by Illiquidity and Contagion Effects
 Automatic Differentiation of Bermudan Style Option Valuations and Error Reduction by Neural Networks
 Construction of an Option-based Indicator for the Detection of Asset Price Bubbles in Financial Networks
 Deep Backward Multistep Schemes for Nonlinear PDEs and Approximation Error Analysis in Finance
 Generalized Black-Litterman Approach: A New Perspective on the Asset Allocation Model
 LIBOR Market Model with Stochastic Volatility

7. FINAL THESES

Machine Learning with Kernels for Portfolio Valuation and Risk Management
Machine Learning with Kernels in Finance
Manager's Portfolio Problem under High-Water Mark Contract
Non-linear Affine Processes and Their Parameter Sets
Portfolio Hedging With a Deep Semi Recurrent Neural Network
Portfolio Selection Under Systemic Risk
Reinforcement Learning for Trading Credit Default Swaps
Robustness in the Optimization of Risk Measures
Tap Water Damage Insurance - Modelling with Combined Actuarial Neural Networks (CANN)
VC Dimension-Based Generalization Bounds For β -Mixing Time Series

MASTER THESES IN PROGRESS:

Affine Forward Variance Models
Asset Price Bubbles: An Option-Based Indicator
Deep Backward Schemes for High-Dimensional Nonlinear PDEs
Frequency-Severity Modelling in the Presence of Nil-Claims
Hybrid Methods for Machine Learning-Based Hedging
Including the Dilution Effect Into Heston's Stochastic Volatility Model
Machine Learning Methods for Market Regime Classification
Model-Independent Deep Hedging
Option Pricing in Exponential Levy Models Using Deep Learning
Portfolio Optimization Using Random Neural Networks
Time Inhomogeneous Polynomial Processes

7.3

FINAL THESES AT THE PROFESSORSHIP OF BEHAVIORAL RISK MANAGEMENT AND INSURANCE

COMPLETED BACHELOR THESES:

Entscheidungen Unter Risiko bei Hohen Einsätzen – Empirische Evidenz für Referenzpunktabhängiges
Verhalten im Profisport
Die Ermittlung von Risiko- und Zeitpräferenzen – Eine Kritische Betrachtung

8. PUBLICATIONS

Beck, C., Gonon, L., Hutzenthaler, M. and Jentzen, A.: On Existence and Uniqueness Properties for Solutions of Stochastic Fixed Point Equations, Discrete & Continuous Dynamical Systems – B, 26, 9, 4927-4962.

Biagini, F., Doldi, A., Fouque, J.P., Fritelli, M. and Meyer-Brandis, T.: Systemic Optimal Risk Transfer Equilibrium, Mathematics and Financial Economics, 15, 2.

Biagini, F., Gnoatto, A. and Oliva, I.: A Unified Approach to xVA With CSA Discounting and Initial Margin, SIAM Journal of Financial Mathematics, 12, 3, 1013-1053.

Biagini F., Huber T., Jaspersen J.G., Mazzon A.: Estimating Extreme Cancellation Rates in Life Insurance, The Journal of Risk and Insurance, 88, 4, 971-1000.

Biagini, F. and Oberpriller, K.: Reduced-Form Setting Under Model Uncertainty With Non-linear Affine Intensities, Probability, Uncertainty and Quantitative Risk, 6, 3, 159-188.

Biagini, F. and Reitsam, T.: A Dynamic Version of the Super-Replication Theorem Under Proportional Transaction Costs, Stochastic Analysis and Applications, forthcoming.

Biagini, F. and Zhang, Y.: Extended Reduced-Form Framework for Non-life Insurance, Journal of Applied Probability, forthcoming.

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Collier, B., Jaspersen, J.G. and Ragin, M.: The Effect of Information Disclosure on Demand for High-Load Insurance, Journal of Risk and Insurance, 88, 161-193.

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Gonon, L., Grohs, P., Jentzen, A., Kofler, D. and Siska, D.: Uniform Error Estimates for Artificial Neural Network Approximations for Heat Equations, IMA Journal of Numerical Analysis, forthcoming.

8. PUBLICATIONS

- Gonon, L., Muhle-Karbe, J. and Shi, X.:** Asset Pricing With General Transaction Costs: Theory and Numerics, *Mathematical Finance*, 31, 2, 595-648.
- Gonon, L. and Ortega, J. P.:** Fading Memory Echo State Networks Are Universal, *Neural Networks*, 138, 10-13.
- Gonon, L. and Schwab, C.:** Deep ReLU Network Expression Rates for Option Prices in High-Dimensional, Exponential Lévy Models, *Finance and Stochastics*, 25, 615-657.
- Huber, T.:** Comparative Risk Aversion in Two Periods: An Application to Self-Insurance and Self-Protection, *Journal of Risk and Insurance*, 89, 97-130.
- Kalinin, A.:** Support Characterization for Regular Path-Dependent Stochastic Volterra Integral Equations, *Electronic Journal of Probability*, 26, 1-19.
- Li L.:** Opening up the Black Box: Technological Transparency and Prevention, *Journal of Risk and Insurance*, 88, 3, 665-693.
- Li L. and Peter R.:** Should We Do More When We Know Less: Optimal Risk Mitigation Under Technological Uncertainty, *Journal of Risk & Insurance*, 88, 3, 695-725.
- Li L., Richter A. and Steinorth P.:** Mental Health Changes and the Willingness to Take Risks, *The Geneva Risk and Insurance Review*, online, Open Access: <https://doi.org/10.1057/s10713-021-00070-7>.
- Limmer, Y. and Meyer-Brandis, T.:** Large Platonic Markets With Delays, *IJTAF*, 24, 8.
- Pennanen, T. and Perkkiö, A.:** Optimal Stopping Without Snell Envelopes, *Proceedings of AMS*, forthcoming.
- Pennanen, T. and Perkkiö, A.:** Topological Duals of Locally Convex Function Spaces, *Positivity*, forthcoming.
- Ragin M., Collier B. and Jaspersen J.G.:** The Effect of Information Disclosure on Demand for High-Load Insurance, *The Journal of Risk and Insurance*, 88, 1, 161-193.
- Richter, A. and Schiller J.:** Versicherungsschutz für Elementarrisiken, *Zeitschrift für Wirtschaftspolitik*, 70(3), 273-281.

9. WORKING PAPERS

Akhtari, B., Biagini, F., Mazzon, A. and Oberpriller, K.: Generalized Feynman-Kac Formula under Volatility Uncertainty.

Argyris N., Jaspersen J.G. and Richter A.: Calibrating Risk Aversion in Additive Multivariate Utility Functions.

Biagini, F., Gonon, L. and Reitsam, T.: Neural Network Approximation for Superhedging Prices.

Biagini, F., Mazzon, A. and Oberpriller, K.: Reduced-Form Framework for Multiple Default Times Under Model Uncertainty.

Biagini, F., Mazzon, A. and Perkkiö, A.-P.: Optional Projections of Local Martingales.

Brigo, D., Graceffa, F. and Kalinin, A.: Mild to Classical Solutions for XVA Equations under Stochastic Volatility.

Browne, M., Lin, X., Richter, A. and Steinacker, R.: On the Trade-Off Between Moral Hazard and Basis Risk: Evidence From Area Contracts in the U.S. Federal Crop Insurance Program.

Collier, B., Huber, T., Jaspersen, J.G. and Richter, A.: How Do Households Respond to Public Program Reforms? Evidence From the U.S. National Flood Insurance Program.

Gonon, L.: Deep ReLU Neural Network Approximation for Stochastic Differential Equations with Jumps.

Gonon, L. and Schwab, C.: Random Feature Neural Networks Learn Black-Scholes Type PDEs Without Curse of Dimensionality.

Heidler, B. and Steinorth, P.: Health Insurance, Chronic Disease and the Affordable Care Act: How Important Are Selection Effects?

Heidler, B., Johannes, J. G., Pooser, D. M. and Richter, A.: Managerial Discretion and Variable Risk Preference.

Holzapfel, J.: Classification Risk in Health Insurance: The Interaction of Prevention and Guaranteed Renewable Insurance.

Holzapfel, J., Peter, R. and Richter, A.: The Role of Insurers in the Internet of Things: Can Imperfect Monitoring Incentivize Prevention?

9. WORKING PAPERS

Huber, M.: An Economic Theory of Resource Conflict.

Huber M., Jaspersen J. G. and Richter A.: The Effect of Large Terrorism Events on the GDP of the Attacked Countries.

Huber, T., Jaspersen, J.G., Richter, A. and Strümpel, D.: On the Change of Risk Aversion in Wealth: Evidence From a Closed Economic System.

Jaspersen, J.G.: Optimal Health Insurance Demand With Restricted Substitution.

Jaspersen, J.G. and Ragin, M.: A Model of Anchoring and Adjustment for Decision-Making Under Risk.

Jaspersen, J.G., Ragin, M. and Sydnor, J.: Insurance Demand Experiments: Comparing Crowdfunding to the Lab.

Jaspersen, J.G., Richter, A., Rothschild, C. and Steinacker, R.: Moral Hazard and Market Capacity: Evidence From a Natural Experiment in Germany.

Jaspersen, J.G., Richter, A. and Zoller, S.: Predicting Earnings Management From Qualitative Disclosures.

Kalinin, A.: Support Characterization for Regular Path-Dependent Stochastic Volterra Integral Equations.

Kalinin, A., Meyer-Brandis, T. and Proske, F.: Stability, Uniqueness and Existence of Solutions to McKean-Vlasov SDEs: a Multidimensional Yamada-Watanabe Approach.

Kalinin, A., Meyer-Brandis, T. and Proske, F.: Stability, Uniqueness and Existence of Solutions to McKean-Vlasov SDEs in Arbitrary Moments.

Li L. and Peter R.: Should We Do More When We Know Less: Optimal Risk Mitigation Under Technological Uncertainty.

Li L., Mürmann A., Peter R. and Richter A.: Prevention of Interdependent Risks: Does Knowledge Improve Coordination?

Pennanen, T. and Perkkiö, A.-P.: Dual Spaces of Cadlag Processes.

Perkkiö, A.-P. and Mazzon, A.: Irreversible Investment.

9. WORKING PAPERS

Perkkiö, A.-P. and Pennanen, T.: Bichteler Construction of Stochastic Integrals in the G-setting.

Perkkiö, A.-P. and Prämel, D.: Robust Hedging of American Options in the Skorokhod Space.

Perkkiö, A.-P. and Trevino, E.: Convex Integral Functionals of Cadlag Processes.

Perkkiö, A.-P. and Trevino, E.: Convex Duality for Partial Hedging of American Options.

Perkkiö, A.-P. and Trevino, E.: Michael Selections and Castaing Representations with Cadlag Functions.

Peter, R., Richter, A. and Thistle, P.: Ambiguity Aversion in Competitive Insurance Markets: Adverse and Advantageous Selection.

Richter, A., Schiller, J. and Stöckl, L.: The Effect of Insurance on Pricing Strategies and Fraud in Markets for Repair Goods.

Stöckl, E.: The Impact of Claimant Fraud on Optimal Coverage in Liability Insurance.

Zoller, S.: How Does the Form of Ownership Affect Disclosure?

Zoller, S.: Textual Analysis as a Tool for Investigating the Confidence of CEOs in Their Beliefs.

10. CONFERENCE PRESENTATIONS AND INVITED LECTURES

Seminar, Verona, Italy, March 2021: Reduced-Form Setting Under Model Uncertainty With Non-Linear Affine Intensities (Biagini)

Risk and Uncertainty Meeting, Oxford, UK, October 2021: Reduced-Form Setting Under Model Uncertainty With Non-Linear Affine Intensities (Biagini)

Workshop at Isaac Newton Institute, Cambridge, UK, November 2021: Deep Learning and Partial Differential Equations (Gonon)

Jahrestagung des Deutschen Vereins für Versicherungswissenschaft, online, March 2021: Prevention Activities Under Risk Type Uncertainty and Their Interaction With Market Insurance (Holzapfel)

S.S. Huebner/ARIA Doctoral Colloquium, online, March 2021: Classification Risk in Health Insurance: The Interaction of Prevention and Guaranteed Renewable Insurance (Holzapfel)

Annual Meeting 2021 of the American Risk and Insurance Association, online, August 2021: Classification Risk in Health Insurance: The Interaction of Prevention and Guaranteed Renewable Insurance (Holzapfel)

Seminar 2021 of the European Group of Insurance Economists, online, September 2021: Classification Risk in Health Insurance: The Interaction of Prevention and Guaranteed Renewable Insurance (Holzapfel)

Temple University, online, April 2021: On the Change of Risk Aversion in Wealth: Evidence From a Closed Economic System (Jaspersen)

Annual Meeting 2021 of the American Risk and Insurance Association, online, August 2021: Predicting Earnings Management From Qualitative Disclosures (Jaspersen)

Annual Meeting 2021 of the American Risk and Insurance Association, online, August 2021: A Model of Anchoring and Adjustment for Decision-Making under Risk (Jaspersen)

Seminar 2021 of the European Group of Insurance Economists, online, September 2021: Convex Combinations in Judgement Aggregation (Jaspersen)

15th German Probability and Statistics Days, Mannheim, Germany, September 2021: Support Characterization for Regular Path-Dependent Stochastic Volterra Integral Equations (Kalinin)

10. CONFERENCE PRESENTATIONS AND INVITED LECTURES

10th General AMAmEF Conference, Padua, Italy, June 2021: Optional Projection Under Equivalent Local Martingale Measures (Mazzon)

SIAM Conference on Financial Mathematics & Engineering, online, June 2021: Stability of Mean-Field Equations (Meyer-Brandis)

Advances in Stochastic Analysis for Handling Risks in Finance and Insurance, Luminy, France, September 2021: Stability of Mean-Field Equations (Meyer-Brandis)

Norwegian-Ukrainian Arctic Workshop, Spitsbergen, Norway, October 2021: Stability of Mean-Field Equations (Meyer-Brandis)

45. Mannheimer Versicherungswissenschaftliche Jahrestagung, online, July 2021: Möglichkeiten und Grenzen von Pandemierisiken – Lessons Learned? (Richter)

Annual Meeting 2021 of the Western Risk and Insurance Association, online, March 2021: Classification Risk in Health Insurance: The Effect of Insurance on Pricing Strategies and Fraud in Markets for Repair Goods (Stöckl)

Annual Meeting 2021 of the American Risk and Insurance Association, online, August 2021: Classification Risk in Health Insurance: The Effect of Insurance on Pricing Strategies and Fraud in Markets for Repair Goods (Stöckl)

Webinar Series on Credence Goods and Expert Markets, online, November 2021: Classification Risk in Health Insurance: The Effect of Insurance on Pricing Strategies and Fraud in Markets for Repair Goods (Stöckl)

Jahrestagung des Deutschen Vereins für Versicherungswissenschaft, online, March 2021: Predicting Earnings Management From Qualitative Disclosures (Zoller)

Annual Congress 2021 of the European Accounting Association, online, May 2021: Predicting Earnings Management From Qualitative Disclosures (Zoller)

Seminar 2021 of the European Group of Insurance Economists, online, September 2021: Textual Analysis as a Tool for Investigating the Confidence of CEOs in Their Beliefs (Zoller)

Annual Meeting of the Southern Economic Association, online, November 2021: Textual Analysis as a Tool for Investigating the Confidence of CEOs in Their Beliefs (Zoller)

11. AWARDS, GRANTS AND SCHOLARSHIPS

Stipendium, Verein zur Förderung der Versicherungswissenschaft in München e.V. (Bollweg)

SCOR-EGRIE Young Economist Best Paper Award 2021 (Holzapfel)

S.S. Huebner Foundation Fellowship (Holzapfel)

Ernst-Meyer-Prize 2021 (Huber)

Excellence Award des Vereins zur Förderung der Versicherungswissenschaft in Hamburg 2021 (Huber)

Stipendium, Verein zur Förderung der Versicherungswissenschaft in München e.V. (Steibel)

Stipendium, Verein zur Förderung der Versicherungswissenschaft in München e.V. (Walter)

12. DOCTORAL WORKSHOPS

MRIC Winter Workshop 2021, online, January 2021

13. DOCTORAL RESEARCH IN PROGRESS

Berti, Lorenzo: Multi-Dimensional Mean-Field Sdes With Irregular Expectation Functional in the Drift

Bollweg, Georg: Stochastic Models with Parameter Uncertainty

Dambaur, Andreas: Essays in Insurance Demand

Holzapfel, Julia: Essays on Risk Management and Insurance

Külpp, Leonard: Essays on Risk Management and Insurance

Oberpriller, Katharina: Mathematical Models for Insurance Markets

Steibel, Annika: Stability Analysis of Pandemic Models

Stöckl, Elisabeth: Essays on Risk Management and Insurance

Walter, Niklas: Topics of Rough Volatility Models

Zoller, Sandra: Essays on the Value of Information for Managerial Behavior under Risk and Uncertainty

14. ACADEMIC VISITORS TO THE MRIC

Due to the Covid-19 pandemic, no academic visitors could be hosted at the MRIC during the reporting year.

15. EXCHANGE PROGRAMS

Due to the Covid-19 pandemic, no student exchanges could be carried out during the reporting year.

16. PRESENTATIONS IN MRIC SEMINAR SERIES

Since the MRIC seminar series presentations are usually given by visiting scholars of the center, they were suspended during the reporting year due to the Covid 19 pandemic.

17. EVENTS HOSTED BY THE MRIC

SEMINARS

Risk & Microeconomics Seminar: Open seminar series offering presentations of international guest lecturers

Risk & Insurance Research Seminar: Internal research seminar of the Institute for Risk Management and Insurance)

COURSES HELD BY INTERNATIONAL GUEST LECTURERS

Prof. Patricia Born (Proseminar: Catastrophe Risk Management)

Prof. Richard Peter (MBR-Course: Microeconomic Modeling Methods)

GUEST LECTURES

Jörg Schiller (University of Hohenheim) in the lecture Risiko und Versicherung: „Versicherungstechnische Risikopolitik“

Dr. Klaus Math (Lebensversicherung von 1871 VVaG) in the lecture BWL in Theorie und Praxis: „Die Versicherung existenzieller Lebensrisiken – eine spannende Herausforderung“

Herrmann Schrögenauer (Mitglied des Vorstands der LV 1871) in the lecture Risiko und Versicherung: „Auswirkungen von Corona auf die LV 1871“

18. PROFESSIONAL BOARD MEMBERSHIPS AND ACADEMIC SERVICE

18.1

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18.3

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Member of the advisory board of the Frankfurter Institut für Risikomanagement und Regulierung (FIRM)

18. PROFESSIONAL BOARD MEMBERSHIPS AND ACADEMIC SERVICE

18.4

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Academic Director, Executive Master of Insurance Program

Past President, American Risk and Insurance Association

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Advisory Board, SKKU Graduate School of Insurance, South Korea

Advisory Board, Federal Financial Supervisory Authority (BaFin)

Advisory Board, Insurance Ombudsmann

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This report refers to the calendar year 2021. For seminar series or courses, which can be attributed to one semester, the report refers to the summer term 2021 and the winter term 2021/2022. With regard to final theses, this report lists papers submitted within the calendar year 2021.

Facts concerning the Workgroup in Financial and Insurance Mathematics and the Chair for Civil Law, European and International Business Law are reported whenever they reflect topics related to the field of risk management and insurance.



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