Publications of

Prof. Dr. Mario V. Wüthrich

Published Monographs

- *Statistical Foundations of Actuarial Learning and its Applications* (with M. Merz). Springer Actuarial 2023. ISBN: 978-3-031-12411-2
  Open Access `https://link.springer.com/book/10.1007/978-3-031-12409-9`
- *Stochastic Claims Reserving Methods in Insurance* (with M. Merz). Wiley Finance 2008. ISBN: 978-0-470-72346-3
- *Market-Consistent Actuarial Valuation* (with H. Bühlmann and H. Furrer). EAA Lecture Notes, Springer 2008. ISBN: 978-3-540-73642-4
- *Market-Consistent Actuarial Valuation* (with H. Bühlmann and H. Furrer). 2nd revised and enlarged edition, EAA Series, Springer 2010. ISBN: 978-3-642-14851-4
- *Market-Consistent Actuarial Valuation*. 3rd edition, EAA Series, Springer 2016. ISBN: 978-3-319-46635-4
- *Mathematik für Wirtschaftswissenschaftler* (with M. Merz). Verlag Vahlen 2013. ISBN: 978-3-8006-4482-7
- *Financial Modeling, Actuarial Valuation and Solvency in Insurance* (with M. Merz). Springer Finance 2013. ISBN: 978-3-642-31391-2
- *Financial Modeling, Actuarial Valuation and Solvency in Insurance*: Japanese translation (with M. Merz). Kyoritsu Shuppan Co 2020. Translated by: Shuji Tanaka, Yasutaka Shimizu, Shuro Okada, Hiroshi Kuroda, Ryota Nakamura, Nana Kato, Katsuhiko Nagai, Suguru Fujita, Manabu Yoshimatsu, Shigeo Watanabe and Yuisuke Watranabe. ISBN: 978-4-320-09649-3
- *Non-Life Insurance: Mathematics & Statistics*. SSRN Manuscript ID 2319328
- *Stochastic Claims Reserving Manual: Advances in Dynamic Modeling* (with M. Merz). SSRN Manuscript ID 2649057

- *Data Analytics for Non-Life Insurance Pricing* (with C. Buser). SSRN Manuscript ID 2870308

Published Articles (Peer-Reviewed)

- Model selection with Gini indices under auto-calibration. *European Actuarial Journal* (2023), in press.

- LASSO regularization within the LocalGLMnet architecture (with R. Richman). *Advances in Data Analysis and Classification* (2023), in press.

- Mixture composite regression models with multi-type feature selection (with T.C. Fung, G. Tzougas). *North American Actuarial Journal* (2023), in press.

- Deep quantile and deep composite model regression (with T. Fissler, M. Merz). *Insurance: Mathematics & Economics* **109** (2023), 94–112.

- LocalGLMnet: interpretable deep learning for tabular data (with R. Richman). *Scandinavian Actuarial Journal* **2023/1** (2023), 71–95.

- On the cost-of-capital rate under incomplete market valuation (with H. Albrecher, K.-T. Eisele, M. Steffensen). *Journal of Risk and Insurance* **89/4** (2022), 1139–1158.

- Interpreting deep learning models with marginal attribution by conditioning on quantiles (with M. Merz, R. Richman, A. Tsanakas). *Data Mining and Knowledge Discovery* **36/4** (2022), 1335–1370.

- Discrimination-free insurance pricing (with M. Lindholm, R. Richman, A. Tsanakas). *ASTIN Bulletin* **52/1** (2022), 55–89.

- Collective reserving using individual claims data (with Ł. Delong, M. Lindholm). *Scandinavian Actuarial Journal* **2022/1** (2022), 1–28.

- Boosting Poisson regression models with telematics car driving data (with G. Gao, H. Wang). *Machine Learning* **111/1** (2022), 243–272.

- The balance property in neural network modeling. *Statistical Theory and Related Fields* **6/1** (2022), 1–9.

- Fitting gamma mixture density networks with expectation-maximization algorithm (with Ł. Delong, M. Lindholm). *Insurance: Mathematics & Economics* **101/B** (2021), 240–261.

- Time-series forecasting of mortality rates using deep learning (with F. Perla, R. Richman, S. Scognamiglio). *Scandinavian Actuarial Journal* **2021/7** (2021), 572–598.

- Making Tweedie's compound Poisson model more accessible (with Ł. Delong, M. Lindholm). *European Actuarial Journal* **11/1** (2021), 185–226.

- Clustering driving styles via image processing (with R. Zhu). *Annals of Actuarial Science* **15/2** (2021), 276–290.

- A neural network extension of the Lee-Carter model to multiple populations (with R. Richman). *Annals of Actuarial Science* **15/2** (2021), 346–366.

- Nagging predictors (with R. Richman). *Risks* **8/3** (2020), 83.

- Bias regularization in neural network models for general insurance pricing. *European Actuarial Journal* **10/1** (2020), 179–202.

- Neural networks for the joint development of individual payments and claim incurred (with Ł. Delong). *Risks* **8/2** (2020), 33.

- Assessing asset-liability risk with neural networks (with P. Cheridito, J. Ery). *Risks* **8/1** (2020), 17.

- Neural network embedding of the over-dispersed Poisson reserving model (with A. Gabrielli, R. Richman). *Scandinavian Actuarial Journal* **2020/1** (2020), 1–29.

- Driving risk evaluation based on telematics data (with G. Gao, H. Yang). *Insurance: Mathematics & Economics* **88** (2019), 108–119.

- Back-testing the chain-ladder method (with A. Gabrielli). *Annals of Actuarial Science* **13/2** (2019), 334–359.

- Scale-free percolation in continuum space (with P. Deprez). *Communications in Mathematics and Statistics* **7/3** (2019), 269–308.

- On the lifetime and one-year views of reserve risk, with application to IFRS 17 and Solvency II risk margins (with P.D. England, R.J. Verrall). *Insurance: Mathematics & Economics* **85** (2019), 74–88.

- Claims frequency modeling using telematics car driving data (with G. Gao, S. Meng). *Scandinavian Actuarial Journal* **2019/3** (2019), 143–162.

- Convolutional neural network classification of telematics car driving data (with G. Gao). *Risks* **7/1** (2019), 6.
- Neural networks applied to chain-ladder reserving. *European Actuarial Journal* **8/2** (2018), 407–436.
- Feature extraction from telematics car driving heatmaps (with G. Gao). *European Actuarial Journal* **8/2** (2018), 383–406.
- Machine learning in individual claims reserving. *Scandinavian Actuarial Journal* **2018/6** (2018), 465–480.
- Consistent recalibration of yield curve models (with P. Harms, D. Stefanovits, J. Teichmann). *Mathematical Finance* **28/3** (2018), 757–799.
- An individual claims history simulation machine (with A. Gabrielli). *Risks* **6/2** (2018), 29.
- Machine learning techniques for mortality modeling (with P. Deprez, P.V. Shevchenko). *European Actuarial Journal* **7/2** (2017), 337–352.
- Bayesian modelling, Monte Carlo sampling and capital allocation of insurance risks (with G.W. Peters, R.S. Targino). *Risks* **5/4** (2017), 53.
- Covariate selection from telematics car driving data. *European Actuarial Journal* **7/1** (2017), 89–108.
- Sequential Monte Carlo sampling for state space models. In: *Robustness in Econometrics*, 25–50, V. Kreinovich, S. Sriboonchitta, V.-N. Huynh (eds), Studies in Computational Intelligence 592, Springer, 2017.
- Full Bayesian analysis of claims reserving uncertainty (with G.W. Peters, R.S. Targino). *Insurance: Mathematics & Economics* **73** (2017), 41–53.
- Construction of directed assortative configuration graphs. (with P. Deprez). *Internet Mathematics*, January 22, (2017).
- Capital allocation for insurance portfolios with non-linear risk aggregation (with T.J. Boonen, A. Tsanakas). *Insurance: Mathematics & Economics* **72** (2017), 95–106.

- Macroprudential insurance regulation: a Swiss case study (with P. Deprez). *Risks* **4/4** (2016), 47.

- Understanding reporting delay in general insurance (with R.J. Verrall). *Risks* **4/3** (2016), 25.

- Case study of Swiss mortality using Bayesian modeling (with L. Huber). *European Actuarial Journal* **6/1** (2016), 25–59.

- Consistent re-calibration of the discrete-time multifactor Vasicek model (with P. Harms, D. Stefanovits, J. Teichmann). *Risks* **4/3** (2016), 18.

- Consistent yield curve prediction (with J. Teichmann). *ASTIN Bulletin* **46/2** (2016), 191–224.

- Consistent re-calibration in yield curve modeling: an example. In: *Causal Inference in Econometrics*, 57–82, V.-N. Huynh, V. Kreinovich, S. Sriboonchitta (eds), Studies in Computational Intelligence 622, Springer, 2016.

- Networks, random graphs and percolation (with P. Deprez). In: *Theoretical Aspects of Spatial-Temporal Modeling*, 95–124, G.W. Peters, T. Matsui (eds), JSS Research Series in Statistics, Springer, 2015.

- Modified Munich chain-ladder method (with M. Merz). *Risks* **3/4** (2015), 624–646.

- Parameter reduction in log-normal chain-ladder models (with R.J. Verrall). *European Actuarial Journal* **5/2** (2015), 355–380.

- Best-estimates in bond markets with reinvestment risk (with A. MacKay). *Risks* **3/3** (2015), 250–276.

- Inhomogeneous long-range percolation for real-life network modeling (with P. Deprez and R.S. Hazra). *Risks* **3/1** (2015), 1–23.

- Best-estimate claims reserves in incomplete markets (with S. Happ and M. Merz). *European Actuarial Journal* **5/1** (2015), 55–77.

- Double chain ladder, claims development inflation and zero claims (with M.D. Martinez-Miranda, J. Nielsen and R. Verrall). *Scandinavian Actuarial Journal* **2015/5** (2015), 383–405.

- Model risk in portfolio optimization (with D. Stefanovits and U. Schubiger). *Risks* **2/3** (2014), 315–348.

- Demand of insurance under the cost-of-capital premium calculation principle (with M. Merz). *Risks* **2/2** (2014), 226–248.

- Hedging of long term zero-coupon bonds in a market model with reinvestment risk (with D. Stefanovits). *European Actuarial Journal* **4/1** (2014), 49–75.

- Indifference pricing for CRRA utilities (with S. Malamud and E. Trubowitz). *Mathematics and Financial Economics* **7/3** (2013), 247–280.

- Estimation of tail development factors in the paid-incurred chain reserving method (with M. Merz). *Variance* **7/1** (2013), 61–73.

- Market value margin via mean-variance hedging (with A. Tsanakas and A. Černý). *ASTIN Bulletin* **43/3** (2013), 301–322.

- Paid-incurred chain reserving method with dependence modeling (with S. Happ). *ASTIN Bulletin* **43/1** (2013), 1–20.

- Statistical review of nuclear power accidents (with M. Hofert). *Asia-Pacific Journal of Risk and Insurance* **7/1** (2013).

- Dependence modeling in multivariate claims run-off triangles (with M. Merz and E. Hashorva). *Annals of Actuarial Science* **7/1** (2013), 3–25.

- Challenges with non-informative gamma priors in the Bayesian over-dispersed Poisson reserving model. *Insurance: Mathematics & Economics* **52/2** (2013), 352–358.

- Statistical modelling and forecasting of outstanding liabilities in non-life insurance (with M.D. Martínez-Miranda and J.P. Nielsen). *SORT-Statistics and Operations Research Transactions* **36/2** (2012), 195–218.

- Modeling accounting year dependence in runoff triangles (with R. Salzmann). *European Actuarial Journal* **2/2** (2012), 227–242.

- Claims development result in the paid-incurred chain reserving method (with S. Happ and M. Merz). *Insurance: Mathematics & Economics* **51/1** (2012), 66–72.

- Reversible jump Markov chain Monte Carlo method for parameter reduction in claims reserving (with R. Verrall). *North American Actuarial Journal* **16/2** (2012), 240–259.

- Bayesian prediction of disability insurance frequencies using economic factors (with C. Donnelly). *Annals of Actuarial Science* **6/2** (2012), 381–400.

- Bayesian overdispersed Poisson model and the Bornhuetter-Ferguson claims reserving method (with P. England and R. Verrall). *Annals of Actuarial Science* **6/2** (2012), 258–283.

- Full and one-year runoff risk in the credibility based additive loss reserving method (with M. Merz). *Applied Stochastic Models in Business and Industry* **28/2** (2012), 362–380.

- Higher moments of the claims development result in general insurance (with R. Salzmann and M. Merz). *ASTIN Bulletin* **42/1** (2012), 355–377.

- Risk margin for a non-life insurance run-off (with P. Embrechts and A. Tsanakas). *Statistics & Risk Modeling* **28/4** (2011), 299–317.

- Development pattern and prediction error for the stochastic Bornhuetter-Ferguson claims reserving model (with A. Saluz and A. Gisler). *ASTIN Bulletin* **41/2** (2011), 279–313.

- An academic view on the illiquidity premium and market-consistent valuation in insurance. *European Actuarial Journal* **1/1** (2011), 93–105.

- Prediction uncertainty in the Bornhuetter-Ferguson claims reserving method: revisited (with D. Alai and M. Merz). *Annals of Actuarial Science* **5/1** (2010), 7–17.

- Cost-of-capital margin for a general insurance liability runoff (with R. Salzmann). *ASTIN Bulletin* **40/2** (2010), 415–451.

- Accounting year effects modelling in the stochastic chain ladder reserving method. *North American Actuarial Journal* **14/2** (2010), 235–255.

- Operational risk: combining internal data, external data and expert opinion (with P.V. Shevchenko). In *Rethinking Risk Measurement and Reporting: Examples and Applications from Finance*, Volume II, K. Böcker (ed.), Risk Books, London 2010, 401–437.

- Chain ladder method: Bayesian bootstrap versus classical bootstrap (with G. Peters and P. Shevchenko). *Insurance: Mathematics & Economics* **47/1** (2010), 36–51.

- Paid-incurred chain claims reserving method (with M. Merz). *Insurance: Mathematics & Economics* **46/3** (2010), 568–579.

- Combining chain-ladder and additive loss reserving methods for dependent lines of business (with M. Merz). *Variance* **3/2** (2009), 270–291.

- Taylor approximations for model uncertainty within the Tweedie exponential dispersion family (with D.H. Alai). *ASTIN Bulletin* **39/2** (2009), 453–478.

- Mean square error of prediction in the Bornhuetter-Ferguson claims reserving method (with D.H. Alai and M. Merz). *Annals of Actuarial Science* **4/1** (2009), 7–31.

- Claims development result for combined claims incurred and claims paid data (with R. Dahms and M. Merz). *Bulletin Français d'Actuariat* **9/18** (2009), 5–39.

- Prediction error of the multivariate additive loss reserving method of dependent lines of business (with M. Merz). *Variance* **3/1** (2009), 131–151.

- Dynamic operational risk: modeling dependence and combining different sources of information (with G.W. Peters and P.V. Shevchenko). *Journal Operational Risk* **4/2** (2009), 69–104.

- Recursive credibility formula for chain ladder factors and the claims development result (with H. Bühlmann, M. De Felice, A. Gisler and F. Moriconi). *ASTIN Bulletin* **39/1** (2009), 275–306.

- Model uncertainty in claims reserving within Tweedie's compound Poisson models (with G.W. Peters and P.V. Shevchenko). *ASTIN Bulletin* **39/1** (2009), 1–33.

- Multivariate extremes and the aggregation of dependent risks: examples and counter-examples (with P. Embrechts and D.D. Lambrigger). *Extremes* **12/2** (2009), 107–127.

- Additivity properties for Value-at-Risk under Archimedean dependence and heavy-tailedness (with P. Embrechts and J. Nešlehová). *Insurance: Mathematics & Economics* **44/2** (2009), 164–169.

- Uncertainty of the claims development result in the chain ladder method (with M. Merz and N. Lysenko). *Scandinavian Actuarial Journal* **109/1** (2009), 63–84.

- Law of large numbers and large deviations for dependent risks (with R. Maier). *Quantitative Finance* **9/2** (2009), 207–215.

- The one-year runoff uncertainty for discounted claims reserves (with H. Bühlmann). *Giornale dell Istituto Italiano degli Attuari* **LXXI** (2008), 1–37.

- Bounds on the estimation error in the chain ladder method (with M. Merz and H. Bühlmann). *Scandinavian Actuarial Journal* **2008/4** (2008), 283–300.

- Credibility for the chain ladder reserving method (with A. Gisler). *ASTIN Bulletin* **38/2** (2008), 565–600.

- Market consistent pricing of insurance products (with S. Malamud and E. Trubowitz). *ASTIN Bulletin* **38/2** (2008), 483–526.

- Data combination under Basel II and Solvency 2: operational risk goes Bayesian (with D.D. Lambrigger and P.V. Shevchenko). *Bulletin Français d'Actuariat* **8/16** (2008), 4–13.

- Prediction error of the multivariate chain ladder reserving method (with M. Merz). *North American Actuarial Journal* **12/2** (2008), 175–197.

- Prediction error in the chain ladder method. *Insurance: Mathematics & Economics* **42/1** (2008), 378–388.

- Prediction error of the chain ladder reserving method applied to correlated run off triangles (with M. Merz). *Annals of Actuarial Science* **2/1** (2007), 25–50.

- Using a Bayesian approach for claims reserving. *Variance* **1/2** (2007), 292–301.

- The quantification of operational risk using internal data, relevant external data and expert opinion (with D.D. Lambrigger and P.V. Shevchenko). *Journal Operational Risk* **2/3** (2007), 3–27.

- Diversification for general copula dependence (with S. Alink and M. Löwe). *Statistica Neerlandica* **61/4** (2007), 446–465.

- Prediction error of the expected claims development result (with M. Merz). *Bulletin Swiss Association Actuaries* **2007/1** (2007), 117–137.

- A "toy" model for operational risk quantification using credibility theory (with H. Bühlmann and P.V. Shevchenko). *Journal Operational Risk* **2/1** (2007), 3–19.

- Valuation portfolio in non-life insurance (with M. Buchwalder, H. Bühlmann and M. Merz). *Scandinavian Actuarial Journal* **2007/2** (2007), 108–125.

- The structural modelling of operational risk via Bayesian inference: combining loss data with expert opinions (with P.V. Shevchenko). *Journal Operational Risk* **1/3** (2006), 3–26.

- The mean square error of prediction in the chain ladder reserving model (Mack and Murphy revisited) (with M. Buchwalder, H. Bühlmann and M. Merz) together with discussions by Mack-Quarg-Braun, Gisler and Venter. *ASTIN Bulletin* **36/2** (2006), 521–571.

- A credibility approach to the Munich chain-ladder method (with M. Merz). *Blätter der DGVFM* **XXVII/4** (2006), 619–628.

- A heteropolymer in a medium with random droplets. *Annals Applied Probability* **16/3** (2006), 1653–1670.

- Estimation of unallocated loss adjustment expenses (with M. Buchwalder, H. Bühlmann and M. Merz). *Bulletin Swiss Association Actuaries* **2006/1** (2006), 43–53.

- Premium liability risks: Modeling small claims. *Bulletin Swiss Association Actuaries* **2006/1** (2006), 27–38.

- Limit distributions of upper order statistics for families of multivariate distributions. *Extremes* **8/4** (2005), 339–344.

- Analysis of the expected shortfall of aggregate dependent risks (with S. Alink and M. Löwe). *ASTIN Bulletin* **35/1** (2005), 25–43.

- Diversification of aggregate dependent risks (with S. Alink and M. Löwe). *Insurance: Mathematics & Economics* **35/1** (2004), 77–95.

- Extreme value theory and Archimedean copulas. *Scandinavian Actuarial Journal* **2004/3** (2004), 211–228.

- Bivariate extension of the Pickands-Balkema-de Haan theorem. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques* **40/1** (2004), 33–41.

- Diffusion of a heteropolymer in a multi-interface medium (with F. den Hollander). *Journal of Statistical Physics* **114/3-4** (2004), 849–889.

- Tail dependence from a distributional point of view (with A. Juri). *Extremes* **6/3** (2003), 213–246.

- Claims reserving using Tweedie's compound Poisson model. *ASTIN Bulletin* **33/2** (2003), 331–346.

- Asymptotic value-at-risk estimates for sums of dependent random variables. *ASTIN Bulletin* **33/1** (2003), 75–92.

- Copula convergence theorems for tail events (with A. Juri). *Insurance: Mathematics & Economics* **30/3** (2002), 405–420.

- Asymptotic behaviour of semi-infinite geodesics for maximal increasing subsequences in the plane. In *In and Out of Equilibrium, Probability with a Physics Flavor*, V. Sidoravicius (ed.) *Progress in Probability.* **51**, Birkhäuser, Boston 2002, 205–226.

- Infinite volume asymptotics of the ground state energy in a scaled Poissonian potential (with F. Merkl). *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques* **38/3** (2002), 253–284.

- Numerical bounds for critical exponents of crossing Brownian motion. *Proceedings American Mathematical Society* **130/1** (2002), 217–225.

- Annealed survival asymptotics for Brownian motion in a scaled Poissonian potential (with F. Merkl). *Stochastic Processes and their Applications* **96/2** (2001), 191–211.

- Phase transition of the principal Dirichlet eigenvalue in a scaled Poissonian potential (with F. Merkl). *Probability Theory and Related Fields* **119/4** (2001), 475–507.

- Geodesics and crossing Brownian motion in a soft Poissonian potential. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques* **35/4** (1999), 509–529.

- Scaling identity for crossing Brownian motion in a Poissonian potential. *Probability Theory and Related Fields* **112/3** (1998), 299–319.

- Superdiffusive behavior of two-dimensional Brownian motion in a Poissonian potential. *Annals Probability* **26/3** (1998), 1000–1015.

- Fluctuation results for Brownian motion in a Poissonian potential. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques* **34/3** (1998), 279–308.

Data Science Tutorials Swiss Association of Actuaries

- SHAP for actuaries: explain any model (with M. Mayer, D. Meier). *SSRN Manuscript*, ID 4389797, 2023.
- Gini index and friends (with C. Lorentzen, M. Mayer). *SSRN Manuscript*, ID 4248143, 2022.
- Individual claims generator for claims reserving studies: data simulation.R (with M. Wang). *SSRN Manuscript*, ID 4127073, 2022.
- LocalGLMnet: a deep learning architecture for actuaries (with J. Schelldorfer). *SSRN Manuscript*, ID 3900350, 2021.
- Convolutional neural network case studies: (1) anomalies in mortality rates (2) image recognition (with D. Meier). *SSRN Manuscript*, ID 3656210, 2020.
- Lee and Carter go machine learning: recurrent neural networks (with R. Richman). *SSRN Manuscript*, ID 3441030, 2019.
- Unsupervised learning: What is a sports car? (with S. Rentzmann). *SSRN Manuscript*, ID 3439358, 2019.
- Nesting classical actuarial models into neural networks (with J. Schelldorfer). *SSRN Manuscript*, ID 3320525, 2019.
- Insights from inside neural networks (with A. Ferrario, A. Noll). *SSRN Manuscript*, ID 3226852, 2018.
- Case study: French motor third-party liability claims (with A. Noll, R. Salzmann). *SSRN Manuscript*, ID 3164764, 2018.

Non-Reviewed Articles, Position Papers and Surveys

- Accurate and explainable mortality forecasting with the LocalGLMnet (with F. Perla, R. Richman, S. Scognamiglio). *SSRN Manuscript*, ID 4381215, 2023.
- Insurance pricing: discrimination, causality, and fairness (with M. Lindholm, R. Richman, A. Tsanakas). *The European Actuary* **33** (Mar 2023), 26–29.
- Isotonic recalibration under a low signal-to-noise ratio (with J. Ziegel). *arXiv*:2301.02692, 2023.
- A discussion of discrimination and fairness in insurance pricing (with M. Lindholm, R. Richman, A. Tsanakas). *SSRN Manuscript*, ID 4207310, 2022.
- A multi-task network approach for calculating discrimination-free insurance prices (with M. Lindholm, R. Richman, A. Tsanakas). *SSRN Manuscript*, ID 4155585, 2022.
- What can we learn from telematics car driving data: a survey (with G. Gao and S. Meng). *Insurance: Mathematics & Economics* **104** (2022), 185–199.
- Recent challenges in actuarial science (with P. Embrechts). *Annual Reviews of Statistics and Its Applications* **9** (2022), 119–140.
- Deep learning under model uncertainty (with M. Merz). *SSRN Manuscript*, ID 3875151, 2021.
- Lee and Carter go deep learning (with F. Perla, R. Richman, S. Scognamiglio). *De Actuaris*, Koninklijk Actuarieel Genootschap, **28-4**, 2021, 40–44.
- Machine learning: the deep end (with F. Perla, R. Richman, S. Scognamiglio). *The Actuary*, Institute and Faculty of Actuaries, August 2020, 24–27.
- The proxy problem (with M. Lindholm, R. Richman, A. Tsanakas). *The Actuary*, Institute and Faculty of Actuaries, June 2020, 24–27.
- From generalized linear models to neural networks, and back. *SSRN Manuscript*, ID 3491790, 2019.
- Believing the bot – model risk in the era of deep learning (with R. Richman, N. von Rummel). *SSRN Manuscript*, ID 3444833, 2019.

- From ruin theory to solvency in non-life insurance. *Scandinavian Actuarial Journal* **2015/6** (2015), 516–526.

- Claims run-off uncertainty: the full picture (with M. Merz). *SSRN Manuscript*, ID 2524352, 2014.

- Bernoulli's law of large numbers (with E. Bolthausen). *ASTIN Bulletin* **43/2** (2013), 73–79.

- Discussion of "A Bayesian log-normal model for multivariate loss reserving" by Shi-Basu-Meyers. *North American Actuarial Journal* **16/3** (2012), 398–401.

- Countercyclical regulation in Solvency II: Merits and flaws (with J. Danielsson, R. Laeven, E. Perotti, R. Ayadi and A. Pelsser). *VoxEU*, June 23, 2012.

- Prediction of disability frequencies in life insurance (with B. König and F. Weber). *Zavarovalniški horizonti* **7/3** (2011), 5–23.

- Das Invaliditätsrisiko in der Kollektivlebensversicherung (with B. König and F. Weber). *Schweizer Personalvorsorge* **08.11** (2011), 32–36.

- Zur Diskontierung der Versicherungsverpflichtungen im SST (with P. Keller and A. Gisler). *Swiss Association of Actuaries SAA*, April 21, 2011.

- A prudential regulatory issue at the heart of Solvency II (with J. Danielsson, P. de Jong, C. Laux, R. Laeven and E. Perotti). *VoxEU*, March 31, 2011.

- Runoff of the claims reserving uncertainty in non-life insurance: a case study. *Zavarovalniški horizonti* **6/3** (2010), 5–18.

- Modelling the claims development result for solvency purposes (with M. Merz). *CAS E-Forum*, Fall 2008, 542–568.

- Mittlerer quadratischer Prognosefehler bei der Prognose des Abwicklungsergebnisses mittels der Chain-Ladder-Methode (with M. Merz). *Zeitschrift für die Gesamte Versicherungswirtschaft*, 2007.

- Vom Swiss Solvency Test zum Risikomanagement-Tool für Nichtlebensversicherungen. In *Swiss Solvency Test, Eine Herausforderung auf vielen Ebenen*, J. Behrens and B. Locher (eds), Ernst & Young, Zurich 2006, 30–34.