

Ludwig-Maximilians-Universität Munich  
Department of Statistics



Invitation to the Final Presentation of the  
Statistical Consulting Project

**Health Insurance Portfolio Analysis:  
Statistical Modelling of Customer Dynamics**  
in Association with Munich Re

In the steering of health insurance, the calculation and determination of adequate premiums is crucial. Basis of this actuarial exercise is the prediction of the claims development in the portfolio. But this task is complicated by the fact that insurance portfolios usually change in a dynamic way, i.e. existing customers switch or cancel their contract and new customers buy policies. These three events strongly influence the premium development in the portfolio and the profit of the insurance company. From the actuarial point of view, it is important to know how the portfolio of their clients evolves in the future. Furthermore the reasons of individual decisions and its dependencies are worthwhile to know.

In this consulting project, statistical transition models, using the theory of stochastic processes or discrete choice models stemming from economic theory were used to better understand the underlying dynamics. Goal of this project was to model the customer dynamics in an appropriate way which allows to estimate/predict prospective portfolio dynamics based on a sample of anonymized data. We consider multivariate regression models as well as Random Forest and Gradient Boosting models. A precision measure serves for assessing the forecast quality.

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<b>Date:</b>	Friday, 10th November 2017, 4:00 p.m. (s.t.)
<b>Location:</b>	Ludwigstr. 33, Room 245 (Alte Bibliothek)
<b>Project Partner:</b>	Andreas Bayerstadler (Munich Re)
<b>Supervisor:</b>	Prof. Dr. Göran Kauermann
<b>Speakers:</b>	Daniel Schalk and David Milewski

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