SUPERVISOR ASSESSMENT OF DIPLOMA THESIS

Title: Actuarial Reserving Methods for Non-Life Insurance
Name: Tongtong Gao

Thesis summary

The thesis deals with reserving methods used in non-life insurance. In particular, it is focused on statistical approach which is based on Generalized Linear and Generalized Mixed Models applied to development triangles.

In first chapter, the reserving problem in non-life insurance is introduced and two basis reserving methods (Chain-ladder and Bornhuetter-Ferguson) are summarized. Second chapter contains deep review of the theory of Generalized Linear Models (GLM) and Generalized Linear Mixed Models (GLMM) including model formulations, parameter estimation methods and statistical tests. These models are than applied to development triangles in chapter 3. The approach always requires splitting the data and analysis to claim counts and claim severity. The special features of these models are discussed extensively. In chapter 4, we can find a numerical study where the models are applied to a real-life dataset. The results of GLM and GLMM are then compared with the classical Chain-ladder approach. Last chapter concludes the work.

Overall thesis evaluation

Thesis topic. In my opinion, the topic was rather difficult for a diploma thesis in program *Financial and Insurance Mathematics*. I believe that the diploma assignment has been fulfilled.

Own contribution. The main contribution of the work lies in the compilation of the theory of GLM and GLMM models and the application of the approach to non-life insurance reserving using these models. Numerical study on real data is also new.

Mathematical level. The thesis contains rigorous mathematical formulations, especially in the second chapter. The mathematical quality is adequate to the study program *Financial and Insurance Mathematics*.

References. The references are properly cited in the text and included in the list which appears at the end of the thesis. I do not see any literally copied parts.

Formal arrangement. I found several type errors, but their frequency is appropriate to the length of the thesis.

Remarks and questions

I have no comments or questions.

Conclusion

I recommend recognizing the work as a diploma thesis.

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