Title: Modelling Bonus - Malus Systems

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Abstract: In this thesis we deal with bonus-malus tariff systems commonly used to adjust the a priori set premiums according to the individual claims during motor third party liability insurance. The main aim of this thesis is to describe the standard model based on the Markov chain. For each bonus-malus class we also determine the relative premium ("relativity"). Another objective of this thesis is to find optimal values for the relativities taking into account the a priori set premiums. We apply the theoretical model based on the stationary distribution of bonus-malus classes on real-world data and a particular real bonus-malus system used in the Czech Republic. The empirical part of this thesis compares the optimal and the real relativities and assesses the suitability of the chosen theoretical model for the particular bonus-malus system.

Keywords: bonus-malus system, a priori segmentation, stationary distribution, relativity, quadratic loss function