Abstract: In the presented thesis we deal with the generalized linear models framework in a claims reserving problem. Claims reserving in non-life insurance is firstly described and the considered class of models is introduced. Consequently, this branch of stochastic modelling is implemented in the reserving setup. For computation of the risk associated with claims reserving, we need a predictive distribution of future liabilities in order to evaluate risk measures such as Value at Risk and Conditional Value at Risk. Since datasets in non-life insurance commonly consist of a small number of observations and estimation of predictive distributions can be complicated, we adopt a bootstrap method for this purpose. Model fitting, simulations and consequent measuring of the reserving risk are performed within the use of real-life data. Based on this, an analysis of fitted models and their comparison together with graphical outputs is included.