1 P&C reserving using GAMLSS models

2 Abstract

The aim of this paper is to introduce the GAMLSS methodology within the stochastic loss reserving framework. The assessment of unpaid claim liabilities distribution is very important for the P&C business in order quantify both the balance sheet figures and the solvency capital requirement of insurers. Generalized linear models have been applied with success in the P&C business framework by England and Verrall in the classical paper [England and Verrall, 2001]. Over dispersed Poisson regression, introduced by [England and Verrall, 2001], currently represents one of the most used claim reserve in the practice. An recently developed extension of GLMs, the GAMLSS regression, allows the analyst to fully characterize the dependent variable distribution modelling all parameters as functions of covariates. The aim of this paper is to revise the classical England and Verrall paper within the GAMLSS regression framework approach. This paper wish to show how the formulas derived under a GLM context can be easily extended using GAMLSS models. The use of GAMLSS improves the estimate of the variability of unpaid claim estimate. In fact it makes the dispersion parameter of the dependent variable to be modelled as function of covariates, as accident, development or calendar year. Numerical examples found in [England and Verrall, 2001] will be reviewed under the GAMLSS reserving framework. Enhancements and limitations of GAMLSS reserving will be discussed at the same time. All examples will be worked by means of R function compatible with the [?] package framework.