Micro-level stochastic loss reserving

Abstract: In this talk we discuss the use of micro–level stochastic models for the run–off of insurance claims. Our analysis uses policy exposure, claims and payments experience data from real life insurance portfolios. Modeling the run–off of both Reported But Not Settled (RBNS) and Incurred But Not Reported (IBNR) claims is the very aim of our work. We put focus on the following components of the development process: the reporting delay, the time to an event, the conditional event type, the conditional payment type (if any), and the conditional severity (if any). We distinguish three types of events: settlement without payment, settlement with a payment and a payment without settlement. Given that a payment is to be made, the conditional payment type model describes the probability that it will be one of three claim types, or any possible combination of them. The conditional severity component describes the claim amount structure according to the combination of types paid. We provide appropriate statistical models for each component and calibrate them to the available data. Our approach is in line with the intensity–based approach in Hastrup and Arjas (1996) but is adapted to the specific hierarchical structure of our data. Our intention is to illustrate the close connection between the actuarial problem of individual claims development in non–life insurance and the statistical framework of recurrent events. Cook and Lawless (2007) provides a recent overview of statistical techniques for the analysis of this type of data. We calculate reserves with this micro–level model and compare them with reserve calculations obtained with traditional actuarial techniques (like chain–ladder and stochastic models using generalized linear models).

References