The Leveled Chain Ladder Model for Stochastic Loss Reserving

Glenn Meyers

The popular chain ladder model forms its estimate by applying age-to-age factors to the latest reported cumulative claims amount – fixed numbers. This paper proposes two models that replace these fixed claim amounts with estimated parameters, which are subject to parameter estimation error. This paper uses a Bayesian Markov-Chain Monte Carlo (MCMC) method to estimate the predictive distribution of the total reported claims amounts for these models. Using the CAS Loss Reserve Database, it tests its performance in predicting the distribution of outcomes on holdout data, from several insurers, for both paid and incurred triangles on four different lines of insurance. Their performance is compared with the performance of the Mack model on these data.

Keywords: Chain Ladder Model, Bayesian MCMC estimation, JAGS, Mack Model, Retrospective Testing of Loss Reserve Estimates, The R ChainLadder Package