Robust and Efficient Methods for Credibility when claims are approximately Gamma-Distributed

Presenter

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Abstract

As is well known in actuarial practice, excess claims (outliers) have a disturbing effect on the ratemaking process. To obtain better estimators of premiums, which are based on credibility theory, Künsch and Gisler and Reinhard suggested using robust methods. The estimators proposed by these authors are indeed resistant to outliers and serve as an excellent example of how useful robust models can be for insurance pricing. In this article we further refine these procedures by reducing the degree of heuristic arguments they involve. Specifically we develop a class of robust estimators for the credibility premium when claims are approximately gamma-distributed and thoroughly study their robustness-efficiency trade-offs in large and small samples. Under specific data-generating scenarios, this approach yields quantitative indices of estimators strength and weakness, and it allows the actuary (who is typically equipped with information beyond the statistical model) to choose a procedure from a full menu of possibilities. Practical performance of our methods is illustrated under several simulated scenarios and by employing expert judgment.

Note

This talk is based on a joint work with Prof. Dr. Vytaras Brazauskas, University of Wisconsin - Milwaukee and has been published in the *North American Actuarial Journal (NAAJ)*, July 2007, Volume 11(3), pp. 138-158.