Title: q-Credibility

Abstract: This article extends credibility theory by making a quadratic adjustment that takes into account the squared values of past observations. This approach amounts to introducing non-linearities in the framework, or to considering higher order moments in the computations. We first describe the full parametric approach and, for illustration, we examine the Poisson-gamma and Poisson-single Pareto cases. Then, we look at the non-parametric approach where premiums must be estimated based on data only, without postulating any type of distribution. Finally, we examine the semi-parametric approach where the conditional distribution is Poisson but the unconditional distribution is unknown.

Keywords: Credibility. Quadratic Approximation. Parametric. Non-Parametric. Semi-Parametric. Poisson-Gamma. Poisson Single Pareto. Uniform Exposure.

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