

Pricing in microinsurance: an application of the Tweedie model

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Within the microfinance sector, microinsurance emerges as innovative and inclusive insurance that provides protection for low-income policyholders against specific risks. This type of products has a basic pricing mainly due to the lack of data and actuarial techniques. This leads microinsurers to add additional charges to premiums to offset unexpected variations in risk assessment. A research gap in microinsurance pricing arises as a challenge to boost the growth of the insurance sector.

This research proposes to apply predictive modelling techniques taking advantage of conventional methodologies as potential solutions in order to improve pricing in the microinsurance market. In particular, we focus on Generalized Linear Models with the Tweedie distribution for a real microinsurance from the Philippines. To do this, we first analyse the features of our available database to identify the most suitable technique. After that, we run the model for our portfolio to get the model that best fits our data. Predictive analysis confirms that Tweedie's compound Poisson-Gamma distribution perfectly fits our particular portfolio. As a result, an optimal model is achieved with three risk factors, age of insured, age policy, and population density.

The results confirm that the proposed model provides more individualized premiums according to the risk profile of our portfolio, besides enhancing the model currently applied by the company. This offers a two fold benefit to the company: additional charges can now be minimized or even removed. On the other hand, our model strengthens risk control through risk factors such as age policy, which penalizes bad risks and rewards good ones, avoiding the adverse selection problem.

To conclude, this research aims to extend the application of the Tweedie model to the actuarial practice of microinsurance pricing and thus promote the development of this inclusive sector.