EMILIANO VALDEZ, Michigan State University
A Revisit of Hierarchical Insurance Claims Modeling

This work describes statistical modeling of detailed, microlevel auto insurance records to analyze experience at the individual vehicle level. We propose a hierarchical model for three components corresponding to the frequency, type, and severity of claims. The first is a negative binomial regression model for assessing claim frequency, with gender, age, and no claims discount as important predictors. The second is a multinomial logit model to predict the type of insurance claim. The third model is for the severity component where we use GB2 distribution for claim amounts and incorporate predictor variables. Using a t-copula, we show a significant dependence among different claim types. This integrated model allows a more efficient prediction of claims than traditional methods.