THE APPLICATION OF PENALIZED MAXIMUM LIKEHOOD ESTIMATION METHOD TO SOLVE SEPARATION PROBLEM IN BINARY LOGISTIC REGRESSION MODEL

ABSTRACT

Parameter estimation of binary logistic regression model cannot be performed by Maximum Likelihood Estimation if complete separation or quasi-complete separation exists. This problem could be solved by Penalized Maximum Likelihood Estimation approach which is discovered by Firth (1993). The analysis' of secondary data showed that credit given by government to seaweed farmers in Kupang District contains quasi-complete separation, so PMLE method is used to get unique and finite estimators. Best model for the data covered several predictors: labor outpouring, cleanliness rate and water content. Based on odds ratio of the parameter estimator, a seaweed farmer in Kupang District has a bigger chance to receive credit if possesses a higher labor outpouring and cleanliness, also lower water content.

Keyword: PMLE, complete separation, quasi-complete separation,
         Binary logistic regression