

C623713 : MAJOR INSURANCE

KEY WORD: MULTIPLE LINEAR REGRESSION / RIGHT-CENSORED DATA / PREDICTION

CHAMNIEN CHAMNONGRUCK : PREDICTION ON MULTIPLE LINEAR REGRESSION WITH
RIGHT-CENSORED DATA. THESIS ADVISOR : ASST. PROF. CAPT. MANOP VARAPHAKEE,
M.S. 125 pp. ISBN 974-636-004-3.

The objective of this study is to compare methods of estimating a response variable in the multiple linear regression equation which has a type I right censored response variable. The methods of estimating parameters of the regression equation under consideration in this study are the Ordinary Least Squares method, the Chatterjee and McLeish method, the Buckley and James method, and the Maximum Likelihood method via EM Algorithm. The comparison was done under conditions of sample sizes 20,30,40,50,60, and 70 with the percentages of censoring 10%, 20%, 30%, and 40% respectively. The residual distributions are Normal, Double Exponential and Lognormal. The fixed censoring values are $\text{mean} + \sigma_T$, $1.5\sigma_T$ and $2\sigma_T$ when σ_T is a standard deviation of the data. The data for this experiment was generated through the Monte Carlo simulation technique. The experiment was repeated 1,000 times under each condition in estimating parameters and evaluating the square root of mean squares error (RMSE) of estimating the response variable.

Results of the study are as follows :-

1. Under all conditions in this study, the RMSE of Maximum Likelihood method via EM algorithm is less than other methods.
2. In case of residuals having Normal distribution and Double Exponential distribution, when the fixed censoring values are $\text{mean} + \sigma_T$ and $\text{mean} + 1.5\sigma_T$, the RMSE of the Buckley and James method is less than the Ordinary Least Squares method. When the fixed censoring value is larger ($\text{mean} + 2\sigma_T$), the RMSE of the Buckley and James method is greater than the Ordinary Least Squares method.
3. In case of residuals have Normal distribution and Double Exponential distribution, when the fixed censoring values are $\text{mean} + \sigma_T$ and $\text{mean} + 1.5\sigma_T$, the RMSE of each method decreases as the percentage of censoring increases. When the fixed censoring value is larger ($\text{mean} + 2\sigma_T$), the RMSE of each method increases as the percentage of censoring increase. In case of residuals having Lognormal distribution, the RMSE increases as the percentage of censoring increases.

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