

ITERATION AND INVERSION ESTIMATORS IN THE LINEAR REGRESSION MODEL

S.N.M.W.W.M.P. WIJEKOON

Department of Statistics & Computer Science, Faculty of Science, University of Peradeniya

The traditional way of estimating the parameters in the linear regression model is the method of least squares. However this method will acquire its good properties only when all assumptions of the model are met. When applying the theory for real world problems, one should expect violation of one or more of these assumptions, which will cause some major problems in parameter estimation. These traps and pitfalls of the linear model are extensively discussed in literature, and therefore it is necessary to find some alternative ways for parameter estimation.

The two alternatives of the traditional least squares estimator in the linear model are the iteration and inversion estimators, which were introduced first by Trenkler (1979). Some stochastic properties of the two estimators were also derived by him in 1981. However in literature these estimators seem to be relatively seldom investigated.

Both the iteration and inversion estimators are based on iterative procedures, and have two control parameters. Since the available statistical software doesn't include an option to obtain these estimators, a computer program has to be written for analyzing the statistical behavior of the two estimators.

In this study a MINITAB macro was written to compute these two estimators using the iteration and inversion procedures introduced by Trenkler (Biased estimators in the Linear Regression Model 1981, page53). To demonstrate the performance of two estimators, the models and data of Gorman/Toman (1966) were applied to this macro. Special attention was made to understand the behavior of the two estimators when the control parameters are increased. An attempt was also made to identify the optimal control parameters. A residual analysis was also done for each case.

Acknowledgement:

University Research Grant (RG/2000/76/S) is acknowledged.