

ON THE EFFICIENCY OF GROUPED REGRESSION ESTIMATORS BASED ON INDIAN CONSUMPTION DATA

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1. INTRODUCTION : For one reason or the other, in the regression analysis of cross-section data in general and of consumer-budget data in particular, one has to deal with grouped observations rather than the original ungrouped observations. In other words, this means that the original observations are first grouped into an appropriate number of classes formed on the basis of some desirable criterion, then class means are obtained for the variables—explained as well as explanatory—entering the regression model, and the regression analysis is applied to these class means. This procedure, except in a trivial case when the groups are of equal size (i.e. have same number of observations each) gives rise to heteroscedastic error term (i.e. the error term does not have a constant variance) in the linear regression model to be fitted to the grouped means. This is so even if the linear regression model to be fitted to the original ungrouped observations is homoscedastic i.e. has a constant variance for its error term.

In order that a heteroscedastic linear model may yield best linear unbiased estimators of the parameters characterising it, and assuming that other basic assumptions underlying the application of the least squares method are fulfilled by the model, we have first to allow for the existence of heteroscedasticity in it. This can, in general, be easily done by weighting the observations inversely proportional to the sampling variance of the error term.

In the particular case of the heteroscedasticity arising on account of grouping the observations, the weights are simply proportional to the number of observations in each group. This method of first weighting the grouped observations and then applying the method of ordinary least squares to the weighted observations, hereinafter called the OLS(W), is to be distinguished from the procedure under which the ordinary method of least squares is directly applied