

ROBUST ESTIMATION IN MULTINOMIAL LOGIT MODELS

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Nominal response data are very common in many fields of research, especially in the health and life sciences. When the outcome variable is more than two levels, the simplest approach to multinomial data is to nominate one of the response categories as a baseline cell and apply a multinomial logit model. Estimation of the parameters of multinomial logit model by maximum likelihood method usually requires iterative procedures since the likelihood equations are intractable and do not have explicit solutions. In this study, to alleviate the difficulties encountered in maximum likelihood, we applied the modified maximum likelihood (MML) methodology to the multinomial logit model and obtained the MML estimators. We show that the MML estimators are explicit functions of sample observations and are, therefore, easy to compute. We also show that they are asymptotically fully efficient under some very general regularity conditions and highly efficient for small sample sizes. Moreover, we study the robustness properties of these estimators via simulations. We also give real life examples.