ABSTRACT

The work of this thesis concerned with the estimation of fixed effects in linear mixed model by considering the random effects as nuisance parameters. We propose improved estimation stargegies like linear shrinkage, shrinkage pretest, James-Stein and positive James-Stein based on linear mixed model for longitudinal data when some of the fixed effect parameters are under a linear restriction. We derived the asymptotic distributional quadratic biases (ADQB) and risks (ADQR) of the proposed estimators and compare their performance with usual maximum likelihood estimator i.e. unrestricted estimator (UE). Graphical comparison have been made on the basis of asymptotic distributional quadratic bias and risks and it is found that proposed estimators are better than UE. The ADQB and ADQR of proposed estimator is lesser as compared to UE for most of the values of Δ. When number of inactive covariates is larger than the number of active covariates then shrinkage pretest performs better.