THE CONVERGENCE RATES OF EMPIRICAL BAYES ESTIMATION IN A MULTIPLE LINEAR REGRESSION MODEL

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Abstract. Empirical Bayes (EB) estimation of the parameter vector $\theta = (\beta', \sigma^2)'$ in a multiple linear regression model $Y = X\beta + \epsilon$ is considered, where β is the vector of regression coefficient, $\epsilon \sim N(0, \sigma^2 I)$ and σ^2 is unknown. In this paper, we have constructed the EB estimators of θ by using the kernel estimation of multivariate density function and its partial derivatives. Under suitable conditions it is shown that the convergence rates of the EB estimators are $O(n^{-(\lambda k-1)(k-2)/k(2k+p+1)})$, where the natural number $k \geq 3$, $\frac{1}{3} < \lambda < 1$, and p is the dimension of vector β.

Key words and phrases: Empirical Bayes estimation, multiple linear regression model, convergence rates.