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Original Articles

Uniform Convergence Rate of Estimators of Autocovariances in Partly Linear Regression Models with Correlated Errors

Jin Hong YOU(1),GeMai CHEN(2),Min CHEN(3),Xue Lei JIANG(4)

(1)University of Regina, Regina, Saskatchewan, S4S 0A2;(2)University of Calgary, Calgary, Alberta, T2N 1N4;(3)(4)Academy of Mathematics and System Sciences, Chinese Academy of Sciences

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摘要 Consider the partly linear regression model y_i = x'_iβ + g(t_i) + ε_i, 1 ≤ i ≤ n, where y_i's are responses, x_i = (x_i1,x_i2,…,x_ip)′ and t_i ∈ T are known and nonrandom design T is a compact set in the real line R, β = (β_1, …, β_p)' is an unknown parameter vector, g(·) is an unknown function and {ε_i} is a linear process, i.e., ε_i = ∑ from j = 0 to ∞ of ψ_je_i-j, ψ_0 = 1, ∑ from j = 0 to ∞ of |ψ_j| < ∞, where e_j are i.i.d. random variables with zero mean and variance σ_e~2. Drawing upon B-spline estimation of g(·) and least squares estimation of β, we construct estimators of the autocovariances of {ε_i}. The uniform strong convergence rate of these estimators to their true values is then established. These results not only are a compensation for those of [23], but also have some application in modeling error structure. When the errors {ε_i} are an ARMA process, out result can be used to develop a consistent procedure for determining the order of the ARMA process and identifying the non-zero coefficients of the process. Moreover, our result can be used to construct the asymptotically efficient estimators for parameters in the ARMA error process.

关键词 uniform strong convergence rate

分类号

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Key words uniform strong convergence rate

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通讯作者 Jin Hong YOU gchen@math.ucalgary.ca(2)