

局部对立条件下斜率变点估计的收敛速度

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Convergence Rate for Slope Change Point Estimator Under Local Alternative Condition

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摘要 对至多只有一个斜率变点的模型, 在误差分布为非正态时, 本文利用滑窗方法研究了局部对立假设下变点估计的相合性和收敛速度问题, 同时给出了部分模拟结果.

关键词: [变点](#) [滑窗](#) [相合性](#) [收敛速度](#)

Abstract: In this paper, the problem of slope-change point is considered with at most one change point. With the help of the slip window method, the convergence rate of change point estimator is obtained at the condition of local alternative hypothesis when the error distribution are not normal.

Key words: [change point](#) [slip window](#) [consistency](#) [convergence rate](#)







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- [1] Bai J, Perron P. Estimating and Testing Linear Models with Multiple Structural Changes. *Econometrica*, 1998, 66: 47-78 
- [2] Braun J V, Braun R K, Muller H G. Multiple Changepoint Fitting via Quaslikelihood with Application to DNA Sequence Segmentation *Biometrika*, 2000, 87(2): 301-314 
- [3] Chen G, Choi Y K, Zhou Y. Nonparametric Estimation of Structural Change Points in Volatility Models for Time Series. *Journal of Econometrics*, 2005, 126: 79-114 
- [4] Chen G, Choi Y K, Zhou Y. Detections of Changes in Return by a Wavelet Smoother with Conditional Heteroscedastic Volatility. *Journal of Econometrics*, 2008, 143: 227-262 
- [5] Pan J, Chen J. Application of Modified Information Criterion to Multiple Change Point Problems. *Journal of Multivariate Analysis*, 2007, 97: 2221-2241 
- [6] Perron P, Qu Z. Estimating Restricted Structural Change Models. *Journal of Econometrics*, 2006, 134(2): 373-399 

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- [7] Schechtman E, Bandner G, Meginy S. Estimating a Change in a Scale Parameter—a Combination of SPC and Change Point Procedure. *International Journal of Production Research*, 2007, 45(23): 5535-5545 
- [8] Chernoff H, Zacks S. Estimating the Current Mean of Normal Distribution which is Subjected Tochange in Time. *The Annals of Statistics*, 1964, 35: 999-1018
- [9] Fotopoulos S, Jandhyala V. Maximum Likelihood Estimation of a Change-point for Exponentially Distributed Random Variables. *Statistics and Probability Letters*, 2001, 51: 423-429 
- [10] Haccou P, Meelis E. Asymptotic Distribution of the Likelihood Ratio Test for the Changpoint Problem for Exponentially Random Variables. *Stochastic processes and Application*, 1987, 27: 121-139 
- [11] Huskova M, Prakova Z, Steinebach J. On the Detection of Changes in Autoregressive Time Series I Asymptotics. *Journal of Statistical Planning and Inference*, 2007, 137: 1243-1259 
- [12] Wu Y. Simultaneous Change Point Analysis and Variable Selection in a Regression Problem. *Journal of Multivariate Analysis*, 2008, 2154-2171 
- [13] 缪柏其, 赵林城, 谭智平. 关于变点个数及位置的检测和估计. *应用数学学报*, 2003, 26: 26-39 (Miao B Q, Zhao L C, Tan Z P. On Detection and Estimation of Change Points. *Acta Mathematica Applicatae Sinica*, 2003, 26: 26-39) 浏览
- [14] Cheon S, Kim J. Multiple Change-point Detection of Multivariate Mean Vectors with the Bayesian Approach. *Computational Statistics and Data Analysis*, 2010, 54: 406-415 
- [15] Daniel B D, Hartigan J A. A Bayesian Analysis for Change Point Problems (in Theory and Methods). *Journal of American Statistical Association*, 1993, 88: 309-319 
- [16] Rudoy D, Yuen S G, Howe R D, Wolfe P J. Bayesian Change-point Analysis for Atomic Force Microscopy and Soft Material Indentation. *Journal of the Royal Statistical Society Series-applied Statistics*, 2010, 59: 1-21 
- [17] Sertkaya D, Kadilar C. A New Bayes Estimate of the Change Point in the Hazard Function. *Computational Statistics and Data Analysis*, 2007, 51: 2993-3001 
- [18] Chen X R. Inference in a Simple Change Point Model. *Scientia Sinica (A)*, 1988, 6: 654-667
- [19] Miao B Q. Inference in a Model with at Most one Slope-change Point. *Journal of Multivariate Analysis*, 1988, 27: 375-391 
- [20] 李慧柳, 谭常春, 缪柏其. 至多一个斜率变点模型的收敛速度. *中国科学技术大学学报*, 2009, 39(9): 1-7 (Li H L, Tan C C, Miao B Q. Strong Convergence Rate for Slope Change Point Estimator in AMOC Model. *Journal of University of Science and Technology of China*, 2009, 39(9): 1-7)
- [21] 谭常春, 缪柏其, 李慧柳. 斜率变点估计的强收敛速度. *数学学报*, 2010, 53(1): 125-134 (Tan C C, Miao B Q, Li H L. Strong Convergence Rate for Slope Change Point Estimator. *Acta Mathematica Sinica*, 2010, 53(1): 125-134)
- [22] Csörgő M, Horvath L. Limit Theorems in Change-points Analysis. New York: John Wiley and Sons, 1997
- [23] Gombay E. U-statistics for Change under Alternatives. *Journal of Multivariate Analysis*, 2001, 78: 139-158 
- [24] Horváth L, Husková M. Testing for Changes Using Permutations of U-statistics. *Journal of Statistical Planning and Inference*, 2001, 128: 351-371 
- [25] Park C W, Kim W C. Estimation of a Regression Function with a Sharp Change Point Using Boundary Wavelets. *Statistics and Probability Letters*, 2004, 66: 435-448 
- [26] Chu J, White H. A Direct Test for Change Trend. *Journal of Business Economic Statistics*, 1992, 10: 289-299
- [1] 王家赠, 薛晓峰. 网络上SIR型传播的随机建模与极限定理[J]. *应用数学学报*, 2012, (4): 663-676.
- [2] 陈家鼎, 陈奇志. 关于洛伦兹曲线和基尼系数的统计推断[J]. *应用数学学报*, 2011, 34(3): 385-399.
- [3] 刘强, 薛留根. 纵向数据下部分线性EV模型的渐近性质[J]. *应用数学学报*, 2009, 32(1): 178-189.
- [4] 张日权. 强相依数据的函数系数部分线性模型的估计[J]. *应用数学学报*, 2006, 29(2): 374-381.
- [5] 欧阳光. 有重复观测时变系数线性结构关系EV模型的参数估计[J]. *应用数学学报*, 2006, 29(2): 247-253.
- [6] 潘雄, 付宗堂. 随机删失半参数回归模型小波估计的渐近性质[J]. *应用数学学报*, 2006, 29(1): 68-80.