Testing for residual correlation in the autoregressive process

Submitted by Frédéric Proïa on Mon, 03/13/2017 - 12:44

Titre	Testing for residual correlation in the autoregressive process
Type de publication	Article de revue
Auteur	Proïa, Frédéric [1]
Editeur	Taylor & Francis
Type	Article scientifique dans une revue à comité de lecture
Année	Sous presse
Langue	Français
Date	2017
Titre de la revue	Communications in Statistics – Theory and Methods
Mots-clés	asymptotic properties of estimators [2], Durbin-Watson statistic [3], least squares estimation [4], residual autocorrelation [5], stable autoregressive process [6], statistical test for residual correlation [7]
Résumé en anglais	We are interested in the implications of a linearly autocorrelated driven noise on the asymptotic behavior of the usual least squares estimator in a stable autoregressive process. We show that the least squares estimator is not consistent and we suggest a sharp analysis of its almost sure limiting value as well as its asymptotic normality. We also establish the almost sure convergence and the asymptotic normality of the estimated serial correlation parameter of the driven noise. Then, we derive a statistical procedure enabling to test for correlation of any order in the residuals of an autoregressive modelling, giving clearly better results than the commonly used portmanteau tests of Ljung-Box and Box-Pierce, and appearing to outperform the Breusch-Godfrey procedure on small-sized samples.
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