



ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΟΚΤΩΒΡΙΟΣ – ΔΕΚΕΜΒΡΙΟΣ 2014

Ξανθή Πεντελή

Department of Statistics

Athens University of Economics and Business

Likelihood estimation for the INAR(p) model by saddlepoint approximation

ΤΕΤΑΡΤΗ 17/12/2014

13:00 – 14:00

**ΑΙΘΟΥΣΑ 607, 6^{ος} ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)**

ΠΕΡΙΛΗΨΗ (ΣΤΑ ΑΓΓΛΙΚΑ)

Saddlepoint techniques have been used successfully in many applications, owing to the high accuracy with which they can approximate intractable densities and tail probabilities. We concern their use for the estimation of high-order integer-valued autoregressive, INAR(p), processes. Conditional least squares estimation and maximum likelihood estimation have been proposed for INAR(p) models, but the first is inefficient for estimating parametric models, and the second becomes difficult to implement as the order p increases. We propose a simple saddlepoint approximation to the log-likelihood that performs well even in the tails of the distribution and with complicated INAR models. We consider Poisson and negative binomial innovations, and show empirically that the estimator that maximises the saddlepoint approximation behaves very similarly to the maximum likelihood estimator in realistic settings.



AUEB STATISTICS SEMINAR SERIES OCTOBER– DECEMBER 2014

Xanthi Penteli

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Athens University of Economics and Business

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Wednesday 17/12/2014

13:00 – 14:00

**ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)**

ABSTRACT

Saddlepoint techniques have been used successfully in many applications, owing to the high accuracy with which they can approximate intractable densities and tail probabilities. We concern their use for the estimation of high-order integer-valued autoregressive, INAR(p), processes. Conditional least squares estimation and maximum likelihood estimation have been proposed for INAR(p) models, but the first is inefficient for estimating parametric models, and the second becomes difficult to implement as the order p increases. We propose a simple saddlepoint approximation to the log-likelihood that performs well even in the tails of the distribution and with complicated INAR models. We consider Poisson and negative binomial innovations, and show empirically that the estimator that maximises the saddlepoint approximation behaves very similarly to the maximum likelihood estimator in realistic settings.