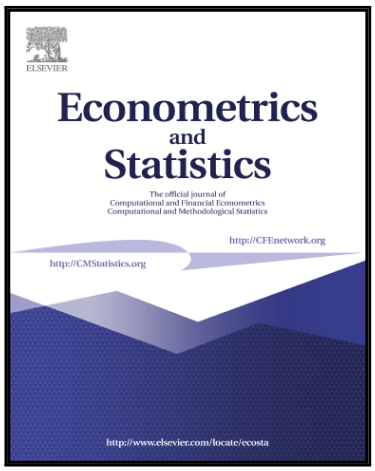

Binary Time Series Models Driven by a Latent Process

Konstantinos Fokianos, Theodoros Moysiadis

PII: S2452-3062(17)30009-6
DOI: 10.1016/j.ecosta.2017.02.001
Reference: ECOSTA 44

To appear in: *Econometrics and Statistics*

Received date: 20 February 2016
Revised date: 19 October 2016
Accepted date: 7 February 2017

Please cite this article as: Konstantinos Fokianos, Theodoros Moysiadis, Binary Time Series Models Driven by a Latent Process, *Econometrics and Statistics* (2017), doi: 10.1016/j.ecosta.2017.02.001

Binary Time Series Models Driven by a Latent Process

Konstantinos Fokianos
Theodoros Moysiadis
University of Cyprus
Department of Mathematics & Statistics
PO BOX 20537 Nicosia 1678 Cyprus

Abstract

The problem of ergodicity, stationarity and maximum likelihood estimation is studied for binary time series models that include a latent process. General models are considered, covered by different specifications of a link function. Maximum likelihood estimation is discussed and it is shown that the MLE satisfies standard asymptotic theory. The logistic and probit models, routinely employed for the analysis of binary time series data, are of special importance in this study. The results are applied to simulated and real data.

Keywords: autocorrelation, generalized linear models, logistic model, probit model, regression, weak dependence.
2010 MSC: 62M10, 62J12, 62F12, 62M20, 62M09

1. Introduction

Figure 1 displays trading activity of six thinly traded shares at the Johannesburg Stock Exchange between the time period from 5th of October 1987 to 3rd of June 1991. These data are binary because for each share the presence (1) or the absence (0) of a trading was recorded. We will further analyze these data in Section 7 but we point out that modeling of presence/absence is of interest for identification of trading patterns, at least for this particular application.

The goal of this article is to study properties of regression based models for the analysis of binary time series; see [1] for an early treatment. Regression modeling, in this context, has been studied by [2], [3], and [4], among others.