Modeling time series of counts with a new class of INAR(1) model

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Abstract This paper presents a new model for a stationary non-negative first order of integer-valued random variables based on the Peggam and thinning operators. Some fundamental and regression properties of the proposed model are discussed. Maximum likelihood estimation (MLE) by the EM algorithm is applied to estimate the parameters. Numerical studies to compare the proposed model with the thinning and Peggam models and the breakdown point of MLE for the proposed model have been conducted. Finally, a real life count data set has been used to illustrate its application. Comparison with existing models by AIC showed that the proposed model is much better and illustrates its potential usefulness in empirical modeling.

Keywords Pegram operator · Thinning operator · Mixture · EM algorithm · Robustness · Additive and innovative outliers

Mathematics Subject Classification 60G10 · 62M10

1 Introduction

Studies on modeling time series data have attracted the attention of many researchers for the past few decades. Important fundamental time series models such as autoreg-

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