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FIRST ORDER THRESHOLD INTEGER-VALUED MOVING AVERAGE PROCESSES

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Abstract. In this paper, we introduce a new threshold model with poisson innovation: Threshold Integer-Valued Moving Average model (TINMA). We derive the numerical characteristics of TINMA(1) model. Stationary and ergodicity are also obtained. The methods of estimation under analysis is Yule-Walker. Some simulation results illustrate the performance of the proposed method.

Keywords. INMA; Threshold; Stationary; Ergodicity; Poisson.

AMS (MOS) subject classification: 37M10, 62M10.

References

[1] Tong, H. (1978). On a threshold model. In C.H. Chen (ed.), Pattern Recognition and Signal Processing, pp. 575–586. Sijthoff and Noordhoff.

[2] Brockwell, P., Liu, J. and Tweedie, R.L. (1992). On the existence of stationary threshold autoregressive moving-average processes[J]. Journal of Time Series Analysis, 13(2): 95–107.

[3] Liu, J. and Susko, E. (1992). On strict stationarity and ergodicity of a nonlinear ARMA model. Journal of Applied Probability, 29, 363–373.

[4] Ling S, Tong H. (2005). Testing for a linear MA model against threshold MA models[J]. The Annals of Statistics, 33(6): 2529–2552.

[5] Ling S, Tong H, Li D. (2007). Ergodicity and invertibility of threshold moving-average models[J]. Bernoulli, 13(1): 161–168.

[6] Ghosh H, Prajneshu, Samanta S. (2013). Fitting of self-exciting threshold autoregressive moving average nonlinear time-series model through genetic algorithm and development of out-of-sample forecasts[J]. Statistics, ahead-of-print: 1–19.

[7] Li D, Ling S, Li W K. (2013).Asymptotic theory on the least squares estimation of threshold moving-
average models[J]. Econometric Theory, 29(3): 482–516.

[8] U. Böckenholt. (2003). Analysing state dependences in emotional experiences by dynamic count data models, Journal of Applied Statistics, 52: 213–226.

[9] Gourieroux C, Jasiak J. (2004).Heterogeneous INAR (1) model with application to car insurance[J]. Insurance: Mathematics and Economics, 34(2): 177–192.

[10] Brännäs K, Shahiduzzaman Quoreshi A.M.M.(2010). Integer-valued moving average modelling of the number of transactions in stocks[J]. Applied Financial Economics, 20(18): 1429–1440.

[11] Yu K., Shi D., and Peter X.K. Song. (2010). First-order random coefficient integer-valued moving average process. Journal of Zhejiang University (Science Edition) , 37(2): 153–159, 2010.

[12] Pedeli X, Karlis D. (2011). A bivariate INAR (1) process with application[J]. Statistical modelling, 11(4): 325–349.

[13] Yontay P, Weiß C H, Testik M C, et al. (2013). A Two-Sided Cumulative Sum Chart for First-Order Integer-Valued Autoregressive Processes of Poisson Counts[J]. Quality and Reliability Engineering International, 29(1): 33–42.

[14] Liu T, Yuan X. (2013). Random rounded integer-valued autoregressive conditional heteroskedastic process[J]. Statistical Papers, 54(3): 645–683.

[15] Thyregod P, Carstensen J, Madsen H, et al. (1999). Integer valued autoregressive models for tipping bucket rainfall measurements[J]. Environmetrics, 10(4): 395–411.

[16] Monteiro M, Scotto M G, Pereira I. (2012). Integer-valued self-exciting threshold autoregressive processes[J]. Communications in Statistics-Theory and Methods, 41(15): 2717–2737.

[17] Hudecová Š. (2013). Structural changes in autoregressive models for binary time series[J]. Journal of Statistical Planning and Inference, 143(10): 1744–1752.

[18] Kashikar A S, Rohan N, Ramanathan T V. (2013). Integer autoregressive models with structural breaks[J]. Journal of Applied Statistics, 40(12): 2653–2669.

[19] Steutel F W, Van Harn K. (1979). Discrete analogues of self-decomposability and stability[J]. The Annals of Probability, pp. 893–899.

[20] DasGupta, A. (2008). Asymptotic theory of statistics and probability [M]. Springer, pp.119–120.

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