

# Application of threshold autoregressive model to exchange rate of USD in Mongolia

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Threshold Autoregressive (TAR) models are popular among nonlinear time-series. TAR models are proposed by Tong (1978) and discussed in detail in Tong and Lim (1980). Hansen (1997) gives the analytic form of the asymptotic distribution for self-exciting TAR(2) models.

The main goal of my research is to define whether there is a nonlinearity behaviour in exchange rate of USD to tugrug. I assume that there is a nonlinearity in rate of USD. Thus, to model nonlinear behaviour in exchange rate of USD, we used self-exciting TAR models with two regimes. The data is monthly average exchange rate of USD covering the period from January, 1993 to March 2013, (Figure 1)

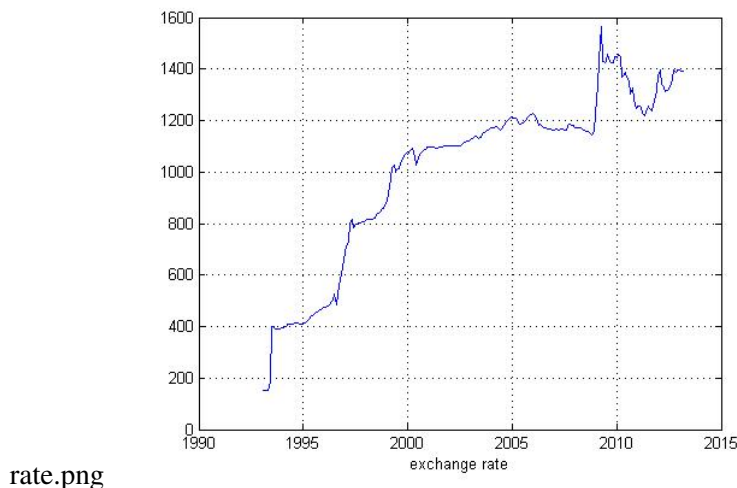


Figure 1: source: The Central Bank of Mongolia

The results of my research is consistent with my hypothesis that the rate of USD is a non-linear process. In addition to the testing of nonlinearity of USD, the threshold variable of the model is defined and values of the next 12 months is predicted according to the model. Matlab is used for the analysis of the research. The regime of the TAR model is built corresponding to economic contractions of exchange rate in Mongolia.

## References

- [1] Hansen, B.E., Inference in TAR Models, *Studies in Nonlinear Dynamics and Econometrics*, 2, 1-14, 1997.
- [2] Hamilton, J.D., *Time Series Analysis*, Princeton University Press, 1994.