

**A comparative study on the relationship between environment and economy based on the classical statistics and Bayesian statistics
——a case study of Gansu province**

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The relationship between environment and economy system is one of the hot spots of academic researches, which mainly focus on the theory and empirical study based on classical statistics, and seldom consider Bayesian statistics. Taking Gansu province as an example, based on the index of eco-environmental quality and GRP of Gansu Province from 1980 to 2010, environmental economy models are established from the perspective of classical and Bayesian statistics respectively in this paper: linear-quadratic model and normal regression model. Both of their statistical results show good estimation performance, and the turning point of the latter is slightly lower than the former. Aimed to examine the long-term equilibrium relationship between the systems of environment and economy from both of the perspectives, the time series analysis are carried out, which concluded with similar results: the econometric model mentioned above are not 'spurious regression', and economy variable Granger caused environmental deterioration, but not vice versa. In addition, the mode of action of environment and economy systems are executed on the basis of both methods, which represented by VAR and BVAR. Since BVAR regard parameters as stochastic variables and prior information (Minnesota prior distribution) is introduced, which consequently has higher prediction accuracy.

Key Words: Bayesian statistics, Gibbs sampling, WinBUGS, Minnesota prior