工程与应用

宏观交通量与GDP的复杂性测度及其相关分析

刘峰涛

东华大学 旭日工商管理学院，上海 200051

摘要　交通运输系统与社会经济系统的系统结构特征需要定量描述。为测度系统的结构特征之一复杂度，引入信息理论的改进的Lempel-Ziv算法——"通用试凑算法"。通过计算宏观交通量与GDP时间序列的复杂度，得到简单结论：GDP复杂度与货运交通量复杂度具有较强的正相关关系；GDP复杂度对宏观交通量复杂度的影响是长期的，具有滞后效应；GDP与宏观交通量现象的相关程度与二者复杂度的相关程度没有必然的联系。

Complexity measure and correlation analysis of macroscopic traffic volume & GDP

LIU Feng-tao

Glorious Sun School of Business and Management，Donghua University，Shanghai 200051，China

Abstract

  It is very important to make a quantificational description for the characters of systematic structure between transportation system and social economic system.The Lempel-Ziv algorithm of information theory is introduced to measure the complexity，one of the characters of systematic structure.Aiming at the limitation of this algorithm，the universal cut-and-try algorithm is put forward.The complexities of macroscopic traffic volume and GDP time series are calculated，respectively.The results show：the complexity of GDP has a positive correlation with the complexity of freight traffic volume；the influence of the complexity of GDP on the complexity of macroscopic traffic volume is long-term with lagged effect；and the correlation between GDP and macroscopic traffic volume has an uncertain relation with the correlation between their complexities.

通讯作者　刘峰涛