



**“Gheorghe Asachi” Technical University of Iasi, Romania**



---

## DYNAMIC EVOLUTION MECHANISM OF CHINA TOTAL FACTOR ENERGY EFFICIENCY: COINTEGRATION ANALYSIS USING THE PANEL DATA FROM 1991 TO 2009

Jian-Min Wang<sup>1\*</sup>, Li Yang<sup>1</sup>, Chuan-Xu Wang<sup>2</sup>

<sup>1</sup>Anhui University of Science and Technology, School of Economics and Management, Huainan 232001, China

<sup>2</sup>Anhui Radio and Television University, Hefei 230022, China

---

### Abstract

In this paper, the panel data model is built to research the dynamic evolution mechanism of the total factor energy efficiency (*TFEE*). Then by using the panel data of China from 1991 to 2009, this paper estimates China's *TFEE* based on the input to the guide DEA model, and empirically researches on the dynamic evolution mechanism of the China's *TFEE* by comparatively analyzing the contribution rate of every influencing factor to the growth rate of *TFEE*. The empirical research results show that the *TFEE* level in China is lower on the whole; only in 2009 the *TFEE* values achieved its efficiency frontier; there is a panel co-integration in the long run relationship between *TFEE* and influencing factors. It is clear that both the industrial structure and the structure of energy consumption have negative influence on *TFEE*, while education level, technical advancement and government influence have positive influence on *TFEE*. The education level has the greatest contribution to the growth of *TFEE*. The *TFEE* will be pushed forward by these influencing factors. The research conclusions of this paper confirm the idea that the increase of energy efficiency depends on the improvement of relevant influencing factors.

*Key words:* panel co-integration, contribution rate, evolution model, total factor energy efficiency

*Received:* February, 2013; *Revised final,* April, 2014; *Accepted:* April, 2014

---

\* Author to whom all correspondence should be addressed: E-mail: [jmwang0396@163.com](mailto:jmwang0396@163.com); Phone: +86 15805543633;