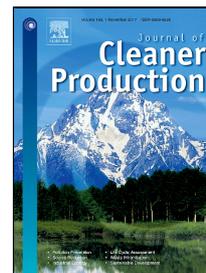


Accepted Manuscript

Regional eco-efficiency and pollutants' marginal abatement costs in China: a parametric approach

Lin Yang, Kai Tang, Zhaohua Wang, Haizhong An, Wei Fang



PII: S0959-6526(17)31946-7
DOI: 10.1016/j.jclepro.2017.08.205
Reference: JCLP 10464
To appear in: *Journal of Cleaner Production*
Received Date: 07 October 2016
Revised Date: 28 August 2017
Accepted Date: 28 August 2017

Please cite this article as: Lin Yang, Kai Tang, Zhaohua Wang, Haizhong An, Wei Fang, Regional eco-efficiency and pollutants' marginal abatement costs in China: a parametric approach, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.08.205

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Regional eco-efficiency and pollutants' marginal abatement costs in China: a parametric approach

Lin Yang ^{a,b}, Kai Tang ^{c,*}, Zhaohua Wang ^b, Haizhong An ^a, Wei Fang ^a

^a School of Humanities and Economic Management, China University of Geosciences, Beijing 100083, China

^b School of Management and Economics, Beijing Institute of Technology, 100081, Beijing, China

^c School of Economics and Trade, Guangdong University of Foreign Studies, 510006 Guangzhou, China

Abstract: Applying a parameterized directional distance function approach, this paper estimates the regional eco-efficiency and pollutants' marginal abatement costs in China based on provincial panel data covering the years 2003-2012. We find that China could potentially save capital, labor, land, energy and water by 18.07%, 11.47%, 11.20%, 12.28% and 11.19%, and reduce emissions of carbon dioxide (CO₂), household refuse and waste water by 11.75%, 11.02% and 11.46%, respectively, on condition that all provinces produced fully efficiently. The south and east coastal areas were the most eco-efficient, while the middle Yangtze River and southwest areas performed relatively poor. For the whole country, the average shadow prices of CO₂, household refuse and waste water were 717.27 Yuan/tonne, 42936.98 Yuan/tonne and 306.65 Yuan/tonne, respectively. The shadow price of CO₂ revealed significant regional disparities and that of household refuse showed a rapid increase throughout the study period. Our estimates suggest that policymakers should take measures to avoid ineffective capital investment and improve economic output efficiency in inland provinces, especially in the middle Yangtze River, northwest and southwest areas, and facilitate technological cooperation between developed and undeveloped areas. The regional heterogeneity and flexible price mechanism of various pollutants should be taken into consideration when making the reduction allocations among different areas.

Keywords: regional eco-efficiency; pollutants' marginal abatement costs; parametric directional distance function; China

1. Introduction

China has achieved rapid economic growth over the past few decades, while the accompanying over-consumption of resource and high-emission of pollutants have posed a threat to its sustainable development. Although China's government has taken efforts to establish a resource-conserving and environment-friendly society, it has not yet fundamentally transformed the unsustainable mode of economic growth characterized by high-input and high-pollution to a sustainable one. It is estimated that the annual economic losses from environmental pollution and ecological damage in China account for 6% of Gross Domestic Product (GDP) (MEPC, 2015). The most traditional instruments for environmental regulation (e.g. setting environment discharge standards) have always been applied as the first choice by the Chinese government. Although these standards play an important role in

* Corresponding author at: School of Economics and Trade, Guangdong University of Foreign Studies, 510006 Guangzhou, China. Tel.: 8618688903167. E-mail addresses: francistang1988@hotmail.com.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات