CURRICULUM VITAE

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Education

- Bachelor of Science (September 2010-June 2014)
  Major: Applied chemistry
  School of chemistry and environmental engineering, Jiangsu University of Technology
  Ranking: 1/67 in the major, GPA: 88.1/100

- Master of Science (September 2014-October 2014, Drop out)
  Major: Chemical Engineering
  School of Chemistry and Chemical Engineering, Southeast University
  Supervisor: Prof. Jiang Yong

- Master of Science (September 2015-August 2016, Switch to the PhD stage)
  Major: Management Science and Engineering
  School of Business, Hohai University
  Supervisor: Associate Prof. Zhang Jie
  Ranking: 8/45 in the major, GPA: 87.89/100

- Doctor of Science (September 2016-present, degree expected in June 2020)
  Major: Management Science and Engineering
  School of Business, Hohai University
  Supervisor: Prof. Wang Jigan
  Ranking: 20/43 in the major, GPA: 86.0/100

Publications

- **Xing Z.C.***, Wang J.G., Zhang J. Total-factor ecological efficiency and productivity in Yangtze River Economic Belt, China: A nonparametric distance function approach. *Journal of Cleaner Production*, 2018, 200, 844-857 (SCI, IF: 5.651).
- **Xing Z.C.***, Wang J.G., Zhang J. Expansion of environmental impact assessment for eco-efficiency evaluation of China's economic sectors: An economic input-output based frontier approach. *Science of The Total Environment*, 2018, 635, 284-293 (SCI, IF: 4.610).
- **Xing Z.C.***, Wang J.G., Zhang J. CO_2 Emission Performance, Mitigation Potential, and Marginal Abatement Cost of Industries Covered in China's Nationwide Emission Trading Scheme: A Meta-Frontier Analysis[J]. *Sustainability*, 2017, 9(6): 932 (SSCI&SCI, IF: 2.075).
- Zhang J., **Xing Z.C.***, Wang J.G. Analysis of CO_2 Emission Performance and Abatement Potential for

Municipal Industrial Sectors in Jiangsu, China. *Sustainability*, 2016, 8(7), 697 (SSCI&SCI, IF: 2.075).

- **Xing Z.C.**, Wang J.G.*****, Zhang J. Research on Pricing of Nationwide Carbon Trading Market under Industry Heterogeneity: Based on Nonparametric Meta-frontier DDF Dynamic Analysis Model. *Soft Science*, 2017, 31(12), 124-128 (CSSCI, In Chinese).
- **Xing Z.C.**, Wang J.G.*****, Zhang J. Research on regional total-factor ecological efficiency of China: Measurement and determinants: Based on the stochastic frontier analysis of Shephard ecological distance function. *China Population, Resources and Environment*, 2018, 28(7), 119-126 (CSSCI, In Chinese).
- **Xing Z.C.**, Wang J.G.*****, Zhang J. Research on Spatial-temporal Variation and Evolution of Total-factor Ecological Efficiency in the Yangtze River Economic Belt. *Resources and Environment in the Yangtze Basin*, 2018, 27(4), 792-799 (CSSCI, In Chinese).
- **Xing Z.C.**, Wang J.G.*****, Zhang J. Research on Total-factor Ecological Performance in the Yangtze River Economic Belt: Based on Non-radial Directional Distance Function. *Soft Science*, 2018, 32(7), 102-106 (CSSCI, In Chinese).
- Zhang J., Yang M., **Xing Z.C.*** A Hierarchical SBM-Tobit Approach for Examining the Influencing Factors of Industrial CO2 Emission Efficiency in the Yangtze River Delta. *International Journal of Applied Decision Sciences*, forthcoming (EI).

Research experiences

- Preside over the Fundamental Research Funds for the Central Universities: Total-factor ecological efficiency and productivity of regions in China (No. 2018B41314).
- National Natural Science Foundation of China: Research on the Initial Allocation of Carbon Emissions Based on Three Equilibrium Relations (Grant No. 41471457).
- Research on the Influencing Factors of the Characteristics of Industrial Enterprises on Enterprise Innovation in Jiangsu Province.
- Research on Evaluation of Ecological Service Value and Harmonious Management of Eastern Route Project of South-to-North Water Transfer.
- Research on Operation Management Efficiency and its Promotion Path for Trans-basin Water Transfer Project: A Case of Hebei Section of the Middle Route of the South-to-North Water Transfer Project.

Editorial Board

- Editorial Board member for Journal of Evolutionary Science

Referee for Journals

- Journal of Cleaner Production
- Mathematical Geosciences
- Environmental Engineering Research

Research Techniques and Skills

- Mathematical modeling skills: the researcher have strong mathematical background.
- Programming skills: the researcher can use R, LINGO and MATLAB to solve mathematical models.
- Data processing and analysis: the researcher can use SPSS, Eviews and Stata to analyze data.
- Data visualization: the researcher can use GIS, Tableau to visualize the results.
- Good writing skills in English academic paper.

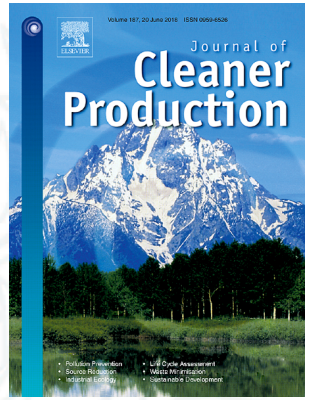
Language

- IELTS: 6.0
- Public English Test System 5-level (PETS-5): 61 points

Honor & Awards

- 2016 National Scholarship for PhD Student.
- 2017 National Scholarship for PhD Student.
- 2017 Outstanding Reviewer Award for Journal of Cleaner Production

ELSEVIER



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Total-factor ecological efficiency and productivity in Yangtze River Economic Belt, China: A non-parametric distance function approach

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ABSTRACT

This paper constructs the total-factor ecological efficiency (TFEcE) and the total-factor ecological productivity index (TFEcPI) based on the proposed Shephard ecology distance function which is derived from the combination of ecological footprint (EF) and the framework of Shephard energy distance function. The unified framework of TFEcE and TFEcPI enables a more comprehensive analysis by simultaneously allowing for both static and dynamic performance evaluations. This paper evaluates the TFEcE and TFEcPI of regions in Yangtze River Economic Belt (YREB), China during the period 2000–2014. Findings reveal that the EF in the YREB takes on an ascending trend, and there exist significant differences of EF among various regions. For the YREB and its three areas, TFEcE displays a trend of "decline first and then fluctuate" at different levels, while total-factor ecological productivity (TFEcP) takes on an ascending trend. There exist significant differences of TFEcE across various regions in the YREB, but the regional disparity is found to present a shrinking trend during our study period. The differences of Cumulative TFEcPI between the three areas have expanded due to the remarkable increase of the upper reach from 2007 to 2014 which may be attributed to its backwardness advantages. Further decomposition analysis reveals that TFEcP growth is mainly driven by technological progress, while efficiency change is found to exhibit a negative effect. Finally, a couple of policy recommendations are concluded based on the findings.

1. Introduction

Since the reform and opening-up launched in 1978, Chinese economy has experienced a dramatic expansion over the past decades. It was calculated that China's Gross Domestic Product (GDP, in constant price) had increased by 29.7 times during 1978–2015 (NBSC, 2016). However, for a long time, China's economic development has followed an extensive mode of growth which largely relies on the high input of ecological resources. For instance, China's energy consumption in 2015 was 7.5 times as much as that of 1978 (NBSC, 2016). Meanwhile, a series of ecological problems (e.g. soil erosion, water pollution, grassland degradation, and the increasing pollution of fog and haze) triggered by the unsustainable economic growth mode are faced by China (Chen et al., 2014; Chen and Jia, 2017; Xing et al., 2017). Along with this fast demand for ecology use, the ecological efficiency should be of concern especially under the ecological improvement is emphasized as a firm pursuit of China's development (NDRC, 2016).

Ecological efficiency, firstly proposed by Schaltegger and Sturm (1990), often serves as a measurement of the coordination degree between economic development and ecological conservation. In this sense, the ecological efficiency is usually defined as the ratio of economic output to ecological input, which indicates how efficient the economic activity is with respect to its ecological impacts (Schmidheiny and BCSD, 1992). Data Envelopment Analysis (DEA, Charnes et al., 1978) is often employed to estimate ecological efficiency in which economic wealth is often taken as the output, while the inputs are various resource usages and environmental impacts. Literature on ecological efficiency assessment with DEA at home and abroad is abundant (Zhang et al., 2008, 2017; Oggioni et al., 2011; Egilmez et al., 2013; Camarero et al., 2013; Huang et al., 2014; Robaina-Alves et al., 2015; Ren et al., 2016; Yang and Zhang, 2016; Chu et al., 2016). For example, Zhang et al. (2008) took three kinds of resource consumptions (i.e. water resource, raw mining resource, energy) and six kinds of environmental pollutant emissions (i.e. chemical oxygen demand, nitrogen, sulphur dioxide,

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Expansion of environmental impact assessment for eco-efficiency evaluation of China's economic sectors: An economic input-output based frontier approach

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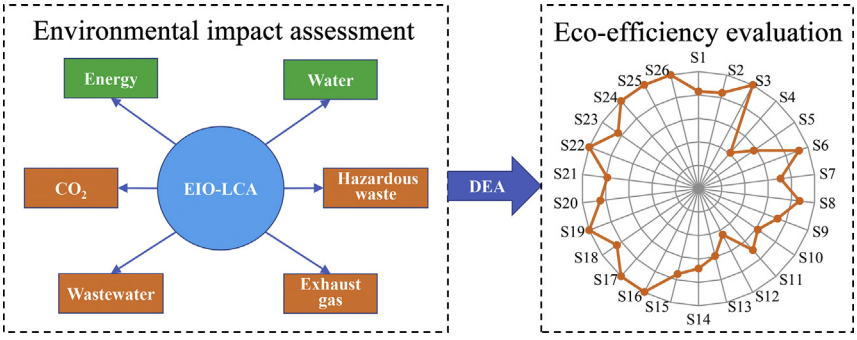
HIGHLIGHTS

- EIO-LCA and DEA are combined to assess eco-efficiency of China's economic sectors.
- The embodied environmental impact transfer between sectors is tracked in detail.
- Electricity and Construction sectors are respectively the largest exporter and importer.
- Eco-efficiency results are not optimistic and vary among sectors.
- Key sectors to control impacts and improve eco-efficiency are uncovered.

GRAPHICAL ABSTRACT



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Data envelopment analysis

ABSTRACT

Due to the increasing environmental burdens caused by dramatic economic expansion, eco-efficiency indicating how efficient the economic activity is with respect to its environmental impacts has become a topic of considerable interest in China. In this context, Economic Input-output Life Cycle Assessment (EIO-LCA) and Data Envelopment Analysis (DEA) are combined to assess the environmental impacts and eco-efficiency of China's 26 economic sectors. The EIO-LCA results indicate that Electricity Production and Supply sector is the largest net exporter in energy usage, CO_2 emission and exhaust emission categories, while Construction sector is the largest net importer for five impact categories except for water withdrawal. Moreover, Construction sector is found to be the destination of the largest sector-to-sector environmental impact flows for the five impact categories and make the most contributions to the total environmental impacts. Another key finding is that Agriculture sector is both the largest net exporter and the greatest contributor for water withdrawal category. DEA results indicate that seven sectors are eco-efficient while over 70% of China's economic sectors are inefficient and require significant improvements. The average target improvements range between 23.30% and 35.06% depending on the impact category. Further sensitivity analysis reveals that the average sensitivity ratios vary from 7.7% to 15.7% among the six impact categories, which are found to be negatively correlated with their improvement potentials. Finally, several policy recommendations are made to mitigate environmental impacts of China's economic sectors and improve their eco-efficiency levels.

1. Introduction

China's reform and opening-up policy launched in 1978 has helped the country achieve remarkable economic growth over the past three

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sustainability

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Article

CO_2 Emission Performance, Mitigation Potential, and Marginal Abatement Cost of Industries Covered in China's Nationwide Emission Trading Scheme: A Meta-Frontier Analysis

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Abstract: China's nationwide emission trading scheme (CN-ETS) is scheduled to be launched in 2017. It is of great urgency and necessity to obtain a good understanding of the participating sectors of CN-ETS in terms of energy utilization and CO_2 emissions. In this regard, it should be noted that the findings may be biased without taking industry heterogeneity into consideration. To this end, a meta-frontier framework with the directional distance function is employed to estimate the CO_2 emission performance (CEP), mitigation potential (MP), and marginal abatement cost (MAC) at sector levels under the meta-frontier and the group-frontier. The results indicate that significant disparities in the CEP, MP, and MAC exist under both frontiers among various sectors, and the sectoral distributions of CEP, MP, and MAC are found to be different between the two frontiers. Additionally, the differences between the two frontiers in terms of CEP, MP, and MAC are considerable, and exhibit unequal distributions among these sectors. Notably, MAC under both frontiers and the difference between them are found to be significantly correlated with the carbon intensity. Finally, policy implications are provided for the government and participating enterprises, respectively.

Keywords: China's nationwide emission trading scheme; directional distance function; meta-frontier analysis; CO_2 emission performance; mitigation potential; marginal abatement cost

1. Introduction

With climate change becoming an increasingly serious issue, the reduction of carbon dioxide (CO_2) emissions has attracted extensive attention worldwide. As the greatest CO_2 emitter in the world [1,2], China has shown its determination for developing a low-carbon economy and promised to abate its CO_2 emissions per unit of gross domestic product (GDP) (i.e., carbon intensity) by 40–45% by 2020 compared with that in 2005 [3]. Further, China set the latest target of abating carbon intensity by 18% by 2020, with 2015 as the reference year [4]. In order to achieve the above international commitments for mitigating CO_2 emissions, China's National Development and Reform Commission (NDRC) has launched seven pilot emission trading schemes (ETS) since 2013 [5], which are specifically located in Shenzhen, Guangdong, Shanghai, Beijing, Tianjin, Chongqing, and Hubei. These regional carbon markets are considered as experimental explorations for the establishment of China's nationwide emission trading scheme (CN-ETS), which is scheduled to be launched in 2017. It is reported the CN-ETS will cover seven emission-intensive industries, including paper making, electricity generation, metallurgy, non-ferrous metals, building materials, the chemical industry, and the aviation service industry [6].

sustainability

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Article

Analysis of CO_2 Emission Performance and Abatement Potential for Municipal Industrial Sectors in Jiangsu, China

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Abstract: As the main source of CO_2 emissions in China, the industrial sector has faced pressure for reducing emissions. To achieve the target of 50% reduction of industrial carbon intensity by 2020 based on the 2005 level, it is urgent to formulate specific CO_2 emission mitigation strategies in the provincial industrial sector. In order to provide decision-making support for the development and implementation of mitigation policy, our undesirable slack based measure (SBM) model is firstly applied to evaluate the industrial CO_2 emission efficiency under total-factor frame (TFICEE) in 13 prefecture-level cities of Jiangsu Province, the largest CO_2 emitter in China. Then, we analyze space-time distribution and distributional evolution tendency of TFICEE by using the GIS visualization method and kernel density estimation, respectively. Finally, we utilize the industrial abatement model to estimate the CO_2 abatement potential of Jiangsu's industrial sector. The empirical results show that there exists a significant spatial inequality of TFICEE across various regions in Jiangsu, but the regional disparity has been narrowing during our study period. Additionally, average annual industrial CO_2 emission reductions in Jiangsu Province can attain 15,654.00 (ten thousand tons), accounting for 28.2% of its average annual actual emissions, which can be achieved by improving production technology, adjusting industrial structure and raising the level of industry concentration.

Keywords: industrial CO_2 emission performance; industrial abatement potential; regional disparity; SBM-Undesirable model; GIS

1. Introduction

With increasingly serious global climate anomalies, climate change has become one of the most severe challenges faced by humankind in the 21st century. An increasing number of countries are concerned with mitigating energy consumption and CO_2 emissions. In particular, China, the world's largest CO_2 emitter since 2007, accounted for 28% of global total CO_2 emissions in 2013 [1], as a result of its rapid urbanization and industrialization. Since entering the middle stage of industrialization, the industrial sector has become the pillar of China's economy, and meanwhile, industrial CO_2 emission (ICE) has been the main source of national CO_2 emissions [2,3]. Thus, how to effectively reduce ICE is a key to achieving the national CO_2 emission reduction targets. In order to tackle climate change and extenuate the rapid growth of ICE, China promised to abate its industrial carbon intensity (defined as CO_2 emissions per unit of industrial added value) by 50% of 2005 levels by 2020 in 2014 [4].

Policy makers have realized that regional disparity, which is caused by imbalanced socioeconomic conditions as well as physical geography, brings difficulties and uncertainties to the development and