

中央财经大学财政学院学者文库

中国财政发展协同创新中心资助项目

**Achieving Carbon
Reductions in the
Chinese Economy:
An Examination of Policy Options**

**实现中国经济
碳减排的政策选择**

研究

By Zhen (Jane) Lu
卢真 著



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Achieving Carbon Reductions in the Chinese Economy:

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卢 真 著

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总 序

1978年，中国徐徐开启了改革开放之门，一缕清新的春风扑面而来，沁人心脾，沉寂多年的财政学术研究复苏了。伴随着经济和财政体制改革，财政理论研究进入了发展和繁荣期。2013年11月党的十八届三中全会《关于全面深化改革若干重大问题的决定》（以下简称《决定》）中，将财政提升到国家治理的层面上来定位，财政是国家治理的基础和重要支柱，是实现国家长治久安的制度保障。2014年6月30日，习近平总书记主持中共中央政治局会议，审议通过《深化财税体制改革总体方案》，提出到2016年基本完成财政改革重点工作和任务，2020年基本建立现代财政制度。财政职能定位的提升和现代财政制度建设目标的提出，也对财政基础理论研究和政策研究提出了新的要求和更高的目标。从改革开放之初至今，财政理论研究始终与当时改革实践中的财政和社会经济问题密切相关，与整个社会经济的发展保持积极的互动关系。

斗转星移，36年过去了！回首中央财经大学财政学科的发展历程：1978年恢复招收本科生，1983年获得硕士学位授予权，2000年获得博士学位授予权，2002年被评为北京市重点学科，2003年被确定为博士生流动站，2007年财政学专业被评为国家重点学科和教育部特色专业建设点，2007年被评为北京市特色专业建设点，并再次被认定为北京市重

点学科，2008年财政学专业教学团队获得北京市优秀教学团队称号，2010年财政学专业教学团队获得国家级优秀教学团队称号，2012年中国财政发展协同创新中心成立。为此，我们要深深感谢中央财经大学财政学界的前辈们，他们为我校财政学科的发展呕心沥血；还要对中央财经大学财政学界的后继者们，尤其是富有朝气的年轻才俊们在教学和科研上的付出与取得的成就，深表敬意。

加强学科建设，促进中央财经大学财政学科发展，把财政学科建设成为我国财政领域人才培养和科学研究的重要基地，是中央财经大学财政同仁孜孜以求的目标。我们希望通过出版教师们的学术专著，彰显他们的科研成果，进而激励我院教师进行科研的热情。让他们融入我国经济社会发展和全面深化改革的浪潮中，以他们专业的视角，用他们的聪明才智，续写财政理论研究的华丽篇章。

从2004年开始，财政学院就设立了出版基金，为本院教师进行财政理论研究提供资助，并且通过这个平台，展示我院教师的科研成果，也为我院教师利用媒体进行学术交流提供了很好的机会，并借此为繁荣我国财政理论研究做出微薄的贡献。

本次入选文库的作者既有我院的教授、副教授，也有新近毕业分配进来的博士。这些作者对各自研究领域的前沿问题有比较深刻的把握，他们以严谨、规范的学术态度展现了对古今中外财政理论的关注和思考。虽然这些著作中的有些学术观点或者内容框架还有待进一步推敲和完善，但其中所闪耀的思想火花必将引发人们更进一步的探索和研究。我们相信会有更多的教师把最新研究成果纳入学者文库，不断充实文库的内涵。

《学者文库》由中央财经大学财政学院、中国财政发展协同创新中心提供资助，并且得到了经济科学出版社的大力支持，对此我们表示衷心的感谢！希望这些著作的面世，能对推动和活跃我国财政理论研究有所裨益。

马海涛

中央财经大学财政学院《学者文库》编委会主任

2015年3月

前 言

作为世界最大的碳排放国家，中国承担着巨大的减排压力，有必要制定相关政策以减少碳排放。碳排污权交易和碳税作为两个主要的市场化减排措施，引起了人们的高度关注。从理论上说，碳排放权交易是最有效的政策措施，但实际上，碳税或能源税政策率先在一些国家采用。本书将从理论和实践两方面比较碳排污权交易和碳税两种政策措施，探讨最适合中国的政策措施，及实施该政策后的主要经济影响。

本书首先调研国内现有排污权交易案例，通过官方报告的数据和访谈等方式重点分析太原市控制二氧化硫排放项目。研究发现，太原市二氧化硫交易项目并没有真正意义上运行起来。从减排效果、成本节约、创新和新能源投资以及投资外溢等角度评估，太原市二氧化硫交易称不上一个成功的排污权交易项目。考虑到中国经济市场化程度不高、法律基础不完善，我们认为排污权交易还不是中国现阶段最好的政策措施，而碳税是当前最可行的措施。

最后，本书利用一般均衡模型分析碳税对中国的经济影响。模型结果表明实施碳税会对中国经济造成一定的负面影响，但考虑到其所能达到的减排效果，该负面影响是可以接受的。实施碳税后，碳密集程度越高的行业受影响越大，会引导人们从高碳能源转向低碳能源或清洁能源。此外，通过将碳税收入转移支付给家庭，碳税对经济的负面影响可以得到一定程度的缓解。借鉴澳大利亚的经验，中国可以将碳税作为一个过渡政策，当市场机制更加成熟之后再转向碳排污权交易政策。

Preface

As the world largest carbon dioxide (CO_2) emitter, China is under pressure to develop policies to mitigate carbon emissions, with market-based approaches under consideration. Emissions trading is theoretically the most efficient approach but some countries are starting with carbon/energy taxes. This research examines these two options through literature and practice in order to evaluate which might be most suitable for China and then to estimate the major economic impacts of the selected option.

The research first looks at the limited cases of emissions trading, with a particular focus, using official reports and data and interviews, on the example of SO_2 control in Taiyuan city. It is found that the Taiyuan SO_2 emissions trading program does not seem to be functioning anything like the ideal emissions trading model and cannot be judged as a successful scheme in terms of emissions reductions, cost savings, innovation and investment in clean energy, and investment leakage. When combined with concerns about the limited development of truly free markets and the weak law basis in China, it is concluded that emissions trading may not be the best policy option at this stage and that a carbon tax might be the most practical interim measure.

Next, the impacts of a carbon tax are considered through a computable general equilibrium (CGE) model for China. The simulation results show that overall the introduction of a carbon tax will have a negative impact on the economy, but this negative impact is relatively gentle if considered against the emissions reductions. After a carbon tax is imposed, carbon intensive sectors will suffer most seriously and there will be a shift away from

high-carbon factors toward low-carbon or non-carbon factors. Moreover, the adverse effects of the tax on economy could be relieved to some extent by subsidizing households, through transfers of the tax revenue. From the experience of Australia, China could also use carbon tax as a transitional policy and then move to carbon emissions trading system when the market mechanism becomes mature.

Zhen (Jane) Lu

List of abbreviations and acronyms

ADB	Asian Development Bank
bbl/d	Thousand barrels per day
CAEP	Chinese Academy for Environmental Planning
CDM	Clean development mechanism
CEM	Continuous Emission Monitoring
CES	Constant elasticity of substitution
CGE	Computable General Equilibrium
CO ₂	Carbon dioxide
COD	Chemical oxygen demand
CPRS	Carbon Pollution Reduction Scheme
EDF	The US Environment Defense Fund
EIA	The US Energy Information Administration
EJ	Etajoules
EPA	The US Environmental Protection Agency
EPB	Environmental Protection Bureau in China
ETS	Emissions trading scheme
EU	European Union
EU ETS	European Union Emissions Trading Scheme
GDP	Gross Domestic Product
GHGs	Greenhouse gases
GW	Gigawatt
IEA	International Energy Agency
I/O	Input-output
IPCC	Intergovernmental Panel on Climate Change

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JI	Joint implementation
MPC	Marginal propensity to consume
Mt	Million tonnes
Mtce	Million tonnes of coal equivalent
Mtoe	Million tonnes of oil equivalent
MW	Megawatt
NDRC	National Development and Reform Commission of the People's Republic of China
NGOs	Non-government organizations
NO _x	Nitric oxide
OECD	Organization for Economic Cooperation and Development
R&D	Research and Development
RFF	Resources for the Future
SAM	Social accounting matrix
SEPA	Chinese State Environmental Protection Administration
SO ₂	sulphur dioxide
t	Tonnes
tce	Tonnes of coal equivalent
toe	Tonnes of oil equivalent
TEC	Total emission control
TWh	TeraWatt hours
UK	United Kingdom
US	United States
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax

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