Overview of CEEM Emissions Trading Design Research

CEEM China- Australia Carbon Market Design Workshop
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CEEM ETS Research: Main Methods

Methods to test design before ETS introduction

- Theoretical Analysis
- Simulations
- Experiments

Methods to evaluate design after ETS implementation

- Data Analysis based on European Union CITL Data

排放交易计划实施前，
机制设计的测试方法

- 理论分析
- 模拟仿真
- 实验

排放交易计划执行后，
机制设计的评价方法

- 数据分析
  (基于欧盟 CITL数据)
CEEM ETS Research

Experiments
- Compliance mechanism
- Auction design
- Market design
- Monitoring, reporting, and verification

Data Analysis (EU ETS)
- Coverage
- Winners and losers
- Role of banks

Compliance mechanisms: Experiment

Theory:
- When the penalty is higher than market price of permits, firms will choose to be compliant.

Research question:
- Will penalty design have effect on compliance rates and market performance?

Sanction types
- Fixed penalty rate, make-good provision, mix of both
- Level: independent, or related to permit price

Results
- Contradicts theory
- Trade-off: make-good provision higher compliance but lower efficiency than fixed penalty

Data Analysis (EU ETS)
- Coverage
- Winners and losers
- Role of banks

Restiani, Phillia and Betz, Regina 2010, The Effects of Penalty Design on Market Performance: Experimental Evidence from an Emissions Trading Scheme with Auctioned Permits, EERH Research Report No.87
Coverage: Simulation and data analysis

**Theory:**
- Broader coverage will make emissions trading more efficient, because more variety in mitigation costs.

**Research question:**
- What are the costs and benefits of covering companies in an ETS compared to an alternative policy, taking transaction costs into account?

**Transaction costs**
- Trading costs, monitoring, reporting, and verification costs…

**Results**
- Efficient coverage depends on cap stringency, transaction costs, and distribution of mitigation costs
- Trading costs may prevent participation (Analysis of expired EUAs)
- Phase-in of sectors may be efficient

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Source: Own calculations based on CITL data
Trading Costs per Installation/Firm

<table>
<thead>
<tr>
<th>upper bound (individual years, yearly prices)</th>
<th>Aggregate Trading Costs (M€)</th>
<th>Installations that did not trade</th>
<th>Per installation (€)</th>
<th>Aggregate Trading Costs (M€)</th>
<th>German firms that did not trade</th>
<th>Per German firm (€)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>6,589</td>
<td>7,912</td>
<td>832,828</td>
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<td>702</td>
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<td>3,111</td>
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<td>62</td>
<td>264</td>
<td>235,698</td>
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<tr>
<td>middle bound (all years, 2005-07 av. price)</td>
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<td>3,111</td>
<td>672,492</td>
<td>66</td>
<td>264</td>
<td>248,542</td>
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<tr>
<td>lower bound (all years, 2007 av. price)</td>
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<td>3,111</td>
<td>32,877</td>
<td>3</td>
<td>264</td>
<td>12,151</td>
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</tbody>
</table>

- Very high as compared to bottom-up studies
- There might be additional factors that inhibit trade, e.g. uncertainty

Source: Own calculations based on CITL data

New CEEM Project:
The Rise of Carbon Markets in China

Aim:
- Foster collaboration between CEEM and universities in China working on carbon market design

Process:
- Exchange of researchers and postgraduates
- Set up working groups on different design elements
- Host two symposia in China, one in Shanghai, and another in Beijing

Potential topics:
- Coverage of electricity production
- State-owned companies
- Allocation rules for new entrants

目的：
- 促進能源与环境市场中心与中国从事碳市场设计的大学的合作

进程：
- 学者与研究生交换
- 根据不同设计要素建立研究组
- 分别在中国北京和上海主办两场学术研讨会

可能的研究课题
- 电力生产企业的实施范围
- 国有企业
- 市场新进入者的配额分配规则
Many of our publications are available at:
www.ceem.unsw.edu.au