Can unilateral trade measures significantly reduce leakage and competitiveness pressures on EU-ETS-constrained industries?

The case of China export taxes and VAT rebates

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Context

• The use of export taxes by EU trade partner countries instead of/in addition to BA inside EU has long been discussed within Climate Strategies
• With three implications to be confirmed or clarified
  – The equivalent economic relief these would give to EU-ETS constrained industries
  – The more friendly political signal given to trade partner countries
  – The more efficient allocation of tax revenues – much closer to the non carbon-priced emission sources (namely, trade partner countries)
Context

- The effective use of export restrictions (XRs) by China on energy intensive products over the last couple of years strengthened the need to assess their implications

- Then the « comparability » issue adds up

Article 10(a) § 17 of the Package specifies that “The list of sectors or sub-sectors exposed to a significant risk of carbon leakage shall be determined after taking into account, where the relevant data are available, the extent to which third countries, representing a decisive share of world production of products in sectors deemed to be at risk of carbon leakage, firmly commit to reducing greenhouse gas emissions in the relevant sectors and within the same time frame to an extent comparable to that of the EU (...)”
Question

• Should China XRs be part of a commitment to reduce national GHG emissions, to what extent measurable such a commitment can be deemed comparable to that of the EU?
How we have proceeded

1. Start with China XRs as they are
2. Investigate their rationale: are they part of a national commitment to reduce GHG emissions or not?
3. Give a first approximate of their economic relief for EU industries – viz their impact on trade flows
4. Measure the equivalent carbon price they charge on China exports

We basically calculate the EU-ETS quota price equivalent of China XRs on energy intensive products – namely, aluminium, steel and cement
1. China export restrictions on energy intensive products
Chinese policies for limiting exports


**Export tax**: generally used when export VAT rebates fail to serve their purpose.
Use of export tax and export VAT refunding cut in EU-ETS leakage sectors

• Sectors selected: steel & iron, aluminium and cement. All sectors have small export/production rate but higher export growth rate than production in recent years.

• Steel: 35% of world total production. Cancellation of the export VAT refunding for most of products and export tax ranging between 5%-25% (higher for primary products).

• Aluminium: 28% of world total production. Export VAT refund rate between 0-5%, export tax of 15% merely on 5 products (HS 8-digit codes).

• Cement: 48% of world total production. Export VAT rebate to zero, no export tax imposed so far.
Export VAT refund and export tax changes 2003-2009

Steel and iron

Aluminium

Cement

Export VAT refund is considered as a profit for Chinese exporters and export tax as a negative cost. ‘High’ line indicates the highest profit that a Chinese exporter can obtain and ‘Low’ line the contrary. ‘Average’ is simply a mathematical average of the sum of the two values.

Note: no export tax in cement sector.
Note: 2009 data is obtained from the Chinese new tariff codes for that year published in December 2008.

Unit: %. Source: authors’ calculation according to each period’s export tax and export VAT refund rate.
2. The rationale of China export restrictions on energy intensive products
China export taxes and export VAT refunding cuts: What for?

• XRs are imposed on products with high pollution rate and low value added.
• This happens along with policies closing to small and energy-wasting factories, or restricting their number.

XRs may be considered as *indirectly* contributing to GHG emission reduction through their contribution to higher energy efficiency.
3. The trade effects of China XRs
(sorry, we skip this)
4. The EU-ETS quota price equivalent of China XRs
Assessing the cost of export restricting measures with EU-ETS quota price equivalent

\[ C = p \times \frac{a}{1 + a} \quad C' = p' \times b \times e \quad p' = \frac{p \times a}{(1 + a) \times b \times e} \]

C is the unit tariff cost of export, p is the average price which is obtained by dividing the total export value by the total export quantity for the products considered, a is the average tariff cost (including VAT refund) in percentage terms.

C’ is the quota cost (or price) of one export unit, p’ is the EU-ETS quota price, b is the average energy consumption for one production unit, and e=2.38 is the CO2 emission per unit of standard coal consumption. Equalizing the two equations, we derive the equivalent quota price as:

\[ p' = \frac{p \times a}{(1 + a) \times b \times e} \]

For cement, we use a modified formula so as to account also for the CO2 emitted during the production process

\[ C' = p' \]
Results: Estimates of EU-ETS quota price equivalent for various levels of export tax

<table>
<thead>
<tr>
<th>Tariff cost</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
<th>25%</th>
<th>30%</th>
<th>35%</th>
<th>40%</th>
<th>45%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>15.72</td>
<td>30.01</td>
<td>43.06</td>
<td>55.02</td>
<td>66.03</td>
<td>76.19</td>
<td>85.59</td>
<td>94.33</td>
<td>102.46</td>
<td>110.05</td>
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<tr>
<td>Aluminum</td>
<td>9.71</td>
<td>18.54</td>
<td>26.6</td>
<td>33.99</td>
<td>40.79</td>
<td>47.07</td>
<td>52.88</td>
<td>58.27</td>
<td>63.3</td>
<td>67.99</td>
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<tr>
<td>Cement</td>
<td>1.28</td>
<td>2.44</td>
<td>3.5</td>
<td>4.47</td>
<td>5.36</td>
<td>6.19</td>
<td>6.95</td>
<td>7.66</td>
<td>8.32</td>
<td>8.94</td>
</tr>
</tbody>
</table>

Unit: euro/tonne
Limitations
Limitations

1. Energy (coal) consumption per unit of product at HS two digit a very rough proxy

2. Estimates need to be revised downward, to account for both (non-energy) direct and indirect effects.
   – The more CO2 emissions embedded, the lower the EU-ETS quota price equivalent

3. We did not correct estimates for terms-of-trade effects – potential world price and EU-ETS CO2 price changes.
   – EU import demand elasticity large, suggesting China may be a price maker, further relaxing hence the competitiveness pressure faced by EU industries (world price surge)
Conclusion

1. Our estimates of the CO2 price embedded in China XRs on aluminum and steel (after correcting roughly for CO2 process-related emissions) lie in the same range as EU-ETS average expected price (20-30 € per ton)

2. For these two products, the energy saved in China and the emissions avoided in the EU occur hence at a comparable value of CO2 price

3. Not the case of cement, « underpriced » in CO2 terms in China XRs

4. Proof of XRs as part of an effective commitment to reduce GHG is weak, though an indirect link can be assumed through XRs contribution to China energy efficiency targets

5. This suggests that export taxes could be part of a deal, viz. less a (conformity) threat than a new bargaining lever