China-European Union Trade and Global Warming

Yang Laike, East China Normal University, China
Liao Chun, Shanghai LiXin University of Commerce, China

ABSTRACT

The globalization of trade has numerous environmental implications. Trade results from a geographic separation of consumption and production. This creates a mechanism for consumers to shift environmental pollution to other countries. China is now the world third biggest trader and the second biggest trade partner of EU. China has also overtaken the U.S. as the world biggest CO\textsubscript{2} emitter since 2005. As China’s biggest trade partner, EU has a large trade deficit with China, but on the other hand, CO\textsubscript{2} emissions embodied in Sino-EU trade are much more unbalanced than the trade imbalance itself. EU avoided a huge amount of CO\textsubscript{2} emissions through trading with China. This lowers CO\textsubscript{2} emissions in the EU and facilitates EU meeting its CO\textsubscript{2} emission reduction targets, but it creates additional environmental burdens for China. In this paper, the dual imbalances between China and the EU, its mechanism, and policy implications will be presented.

Keywords: China, CO\textsubscript{2} Emissions, EU, Global Warming, Trade

I. INTRODUCTION

Thanks to its fast growing economy and successful economic transformation, China is now ranked as the world’s third largest trader. It also has the largest trade surplus globally, particularly to the European Union (EU) and the United States. In 2006, China’s trade surplus against the EU (25) reached an all-time high of €128,408 billions, almost three times as much as in 2001. China is the second largest trade partner and the biggest source of trade deficit for the EU (see Table 1). The trade deficit has resulted in still ongoing trade disputes between the EU and China. At the mean time as China’s foreign trade expanding massively, China’s energy consumption and Carbon Dioxide (CO\textsubscript{2}) emissions are also increasing very rapidly.

International trade has strong impacts on environment. Trade generally results from a geographic separation of consumers and productions, and an important side-effect is a geographic separation of consumers and the pollutions emitted in production of consumer goods. Trade in this manner creates a mechanism for consumers to shift emissions associated with their consumption to other countries. The EU, through its increasing trade deficit with China...
has effectively transmitted a huge amount of its CO$_2$ emissions to China.

In recent years, many researchers have acknowledged the importance of CO$_2$ embodied in international trade. Wyckoff and Roop (1994), warned that based on a review of CO$_2$ embodied in the imported manufacturing goods to six largest OECD countries between 1984 and 1986, that many national greenhouse gas (GHG) mitigation policies, which were planned to control and reduce domestic CO$_2$ emissions, would not be effective if emissions of imports that contribute significantly to domestic consumption would be included in the calculation of total CO$_2$ emissions. Schaeffer and de Sa (1996) studied CO$_2$ emissions embodied in Brazil’s foreign trade during 1970-1992 and concluded that CO$_2$ emissions were transferred from developed countries to developing countries. Ahmed and Wyckoff (2003) explored the role of trade in 24 countries by creating an indicator that estimates CO$_2$ emissions related to domestic demand. Using the Life Cycle Analysis method, Weber and Matthews (2007) studied CO2 emissions related to international trade of the U.S.

There are also an increasing number of studies focused on China’s foreign trade and CO2 emissions. Shui and Harriss (2006) studied CO2 embodied in US-China trade, and concluded that the US outsourcing a lot of its emissions via importing from China. Ahmad and Wyckoff (2003) found that in 1997, 15% of China’s emissions were embodied in exports and 3% of China’s domestic emissions were imported. Wang and Watson (2007) estimated that, in 2004, about 23% of the emissions in China’s were exports related. Peters and Hertwich (2008) analyzed the emissions embodied in China’s foreign trade for 87 countries and found that China exported 24% of its CO2 emissions and imported 7% of China’s domestic emissions.

The EU is China’s biggest trade partner, and China is EU’s second biggest trade partner. Despite the references we mentioned above, there have been little comprehensive studies on the emissions embodied in Sino-EU trade. There is a large body of literatures on the EU-China trade, but most of the researches only focused on economic impacts, no much attention have been paid to environmental impacts of trade. That is what we try to do in this article. We focus our study on CO$_2$ emissions because CO$_2$ is the most important Green House Gas, it accounts for about 72% of the global warming effects.

The structure of the paper is as follows: Part II analyzes the dual imbalance between China-EU: trade imbalance and CO$_2$ emissions imbalance. In Part III and Part IV, the mechanisms and the reasons of the dual imbalance between China and the EU are analyzed. In Part V we come up with some conclusions and policy recommendations.

### Table 1. Trade balance of EU 25 with China and with the world

<table>
<thead>
<tr>
<th>Year</th>
<th>EU 25 trade with China (billions €)</th>
<th>EU 25 trade with the World (billions €)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Export</td>
<td>Import</td>
</tr>
<tr>
<td>2002</td>
<td>34.869</td>
<td>89.610</td>
</tr>
<tr>
<td>2003</td>
<td>41.170</td>
<td>105.389</td>
</tr>
<tr>
<td>2005</td>
<td>51.646</td>
<td>158.481</td>
</tr>
<tr>
<td>2006</td>
<td>63.361</td>
<td>191.769</td>
</tr>
</tbody>
</table>

Source: summarized from EU trade statistics.
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