

Building a Research Network for Climate Change and China-EU Trade

Final Project Report

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Academic Consortium 21

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1. Project Summary

In the area of environmental economics in open economies, there has been a long-running debate known as “pollution haven hypothesis (PHH)”. Its main argument is whether pollution-intensive manufacturing has a tendency to move from developed countries to developing countries, where the environmental regulations are comparatively lax. With increasing attention being paid to the issue of climate change, a new research field, connecting both PHH and climate change, is becoming more and more important. Many exciting questions remain open in this field. For example, both scholars and governments are eager to find out whether stricter carbon emission standards will dampen the competitiveness of trade. With the generous support of AC21, our four universities, two from China and two from Europe, have established an interdisciplinary team to work together on climate change and China-EU trade. The research team will provide a platform for future academic exchanges and hopefully contribute to the international collaboration of the four AC21 partner universities.

The four AC21 partner universities enrolled in this project are Nanjing University, Huazhong University of Science & Technology, the University of Strasbourg and the University of Freiburg. In addition, three non-AC21 institutions have also joined the project. They are China’s Ministry of Commerce, China’s Ministry of Environmental Protection, and the University of Goettingen in Germany. All these AC21 partners and non-AC21 institutions have contributed greatly to the project.

The summaries of our major activities are listed below:

- (1) Set up an international interdisciplinary team consisting of professors, doctoral students and master’s students from the AC21 partners and non-AC21 institutions.

- (2) Academic visits among cooperating universities and student exchange projects.
- (3) Held a series of seminars on climate change and China-EU trade.
- (4) Published co-authored papers at four conferences.

2. Hangzhou Conference

We participated in the 3rd China Trade Research Group (CTRG) Annual Conference held on May 17-18 in Hangzhou.

Organizer: China Trade Research Group

Local Organizer: School of Economics, Zhejiang University

Sponsors: School of International Business Administration, SHUFE

Institute for China and Global Development, HKU

THE China Trade Research Group (<http://gsl.shufe.edu.cn/ctr/index.asp>), or CTRG, was founded in August 2010 in Shanghai, China. The goal of CTRG is to establish a world-wide research platform on international trade and FDI concerned with China.

Below is our conference poster showing the AC21 logo.



Processing Trade and Enterprise Productivity in China

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Introduction

Within the last 10 years, the influence of export on enterprises' productivity has become one of the core research topics in the field of new trade theory. Melitz (2003), Bernard et al. (2003), Melitz & Ottaviani (2008) and other scholars all pointed out that due to a variety of fixed costs and sunk costs of exports, export enterprises ought to have a higher productivity than non-export enterprises. The high productivity of the export enterprises was supported by empirical studies conducted in many countries, and initiated many literatures to explore the reasons behind it (Bernard & Jensen, 1999; Clerides et al., 1998; De Loecker, 2007). However, the empirical studies based on the world's largest exporter, China, provide different results. For example, Lu et al. (2010) found that the productivity of foreign invested export enterprises is much lower than that of non-export enterprises. In addition, Lu's (2010) found that labor productivity of export enterprises is lower than non-export enterprises in the labor-intensive industries. The same applied to capital-intensive industries whose labor productivity in export enterprises remained higher than the non-export enterprises. If the anomaly phenomenon of the low productivity of export enterprises exists in China, what is the cause?

The study concentrates on the significant differences concerning the export performance and behavioral differences between the processing trade and trade enterprises. The research takes their basic distinction into consideration, without which researchers may have biased understanding. By studying the export behavior of developing countries where processing trade is prevalent such as China, Vietnam, Mexico and etc., we must give thought to the complex effects brought by the processing trade enterprises, especially the foreign-funded enterprises.

Methods

Data

The paper merges two sources of official statistics. The first data source is derived from the National Bureau of Statistics survey about industrial enterprises above designated scale from 2000 to 2006. The survey covers all of China's state-owned enterprises and non-state-owned enterprises above designated scale (i.e. enterprises whose total value of output is more than 5,000,000).

The second data source is the monthly trade data at the transaction-level from China's General Administration of Customs. The data contains monthly import and export trade information about customs clearance enterprises, including the business duty paragraph, import and export products, import and export volume, value, destination (source), and transport manner.

Methodology

$$\ln \text{valueadded}_{it} = \alpha_0 + \alpha_1 \ln I_{it} + \alpha_2 \ln K_{it} + \alpha_3 \ln P_{it} + \alpha_4 \ln \text{industry}_{it} + \alpha_5 \ln \text{market}_{it} + \alpha_6 \ln \text{TFP}_{it}$$
$$+ \sum_{j=1}^J \ln \text{sector}_{itj} + \sum_{k=1}^K \ln \text{industry}_{ik} + \sum_{l=1}^L \ln \text{market}_{il} + \epsilon_{it}$$

$$\text{TFP}_{it} = \ln \text{valueadded}_{it} - \hat{\alpha}_1 \ln I_{it} - \hat{\alpha}_2 \ln K_{it}$$

$$\text{TFP}_{it} = \beta_0 + \sum_{j=1}^J \ln \text{sector}_{itj} + X + \gamma \ln \text{value} + \delta \ln \text{market} + \eta \ln \text{TFP}_{it}$$

TPP models

As Voth (2012) pointed out in his review paper, the current ways to estimate the enterprises' TFP can be summarized as follows: the fixed effects methods (FE), the instrumental variable method (IV) and GMM, Ollivier-Pakes semi-parametric method (OP) and Levinsohn-Petrin semi-parametric methods (LP). However, they all suffer shortcomings.

Measurements Comparison

- (1) Comparing regression results of POLS and OP method, whether it is the depreciation rate of 5% or 10.01% as the OP method to estimate the amount of business investment, the regression coefficients of $\ln k$ is larger than that of the POLS regression coefficient of $\ln k$. Obviously, the result shows that OP is effective, (2) the regression coefficient of $\ln k$ is lower than other methods in estimation results of the LP method.
- (3) The regression coefficient of $\ln k$ is relatively close, while the gap of the coefficient of $\ln k$ is relatively large in all estimation methods.

Results

Are there any significant differences in TFP between different types of export enterprises and non-export enterprises?

According to our calculation, the TFP of processing trade enterprises is not only significantly lower than non-export enterprises, but also much lower than that of the general trade and mixed trade enterprises. It seems that such conclusion challenges the logic of new trade theory.

The calculation in this paper is based on the adopting of integrated database of Chinese industrial enterprises and China Customs from 2000 to 2006 and equipped with multiple mainstream accounting methods of enterprises' TPP.

The deeper study found that the low TFP of processing trade enterprises was caused by low value added of processing trade enterprises, while the low value added of processing trade enterprises was not caused by true low productivity of processing trade enterprises, but caused by enterprises value added constituted by lower wages and taxes. Therefore, we cannot find enough empirical evidence to prove that it is really contrary to the heterogeneity hypothesis that productivity of export enterprises is higher than the non-export enterprises in the processing trade enterprises, of new international trade theory.

The most important finding of this paper is that foreign-invested enterprises, including enterprises invested by Hong Kong, Macau and Taiwan, Hong Kong, Macau and Taiwan, are the main reasons related to the phenomena.

As for the foreign-invested enterprises, the results of different methods to estimate the enterprises' TFP show that the TFP of the processing trade enterprises is significantly lower than non-exporting enterprises, and more significantly lower than the general trade enterprises and mixed trade enterprises. In State-owned and collective enterprises, there is no significant difference between type of enterprises, in processing trade enterprises, general trade enterprises or mixed trading enterprises, their TFP is significantly higher than the non-export enterprises. And the results are consistent with the heterogeneity hypothesis that the productivity of export enterprises is higher than non-export enterprises in new international trade theory. While in enterprise of private ownership, the index of TFP of processing trade enterprises is higher than non-exporting enterprises, the results of different methods to estimate the enterprises' TFP show that the TFP of processing trade enterprises is not lower than the non-export enterprises stably, but it is significant lower than the general trade enterprises and mixed trade enterprises.

With respect to the reason why the TFP of foreign-invested processing trade enterprises is so low, we can find the reason why the TFP of foreign-invested processing trade enterprises is so low is because the low value added of foreign-invested processing trade enterprises closely related to price transferring in the type of processing trade of foreign-invested enterprises and the "super-national" preferential tax policies engaged in foreign-invested processing trade enterprises and lower wage expenditure.

Bibliography & Acknowledgement

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Atthis conference, we met aprofessor from another AC21 partner,Peking University, and found that there were many overlaps between our research and his. We exchanged research ideas and talked about the possibility of future collaboration.

3. Xiamen Conference

We joined the 2013(2nd) Young Scholars Symposium on InternationalEconomics and Business, on Nov. 29 –Dec.1 in Xiamen.

The title of our paper was“Carbon Emissions and China-EU Trade”. The coauthors of the paper are all from the AC21 partner institutions, consisting of Prof. Shu Yang from Huazhong University of Science & Technology, Dr. PierrePessarossi from the University of Strasbourg and Mr. Yannick Bury from the University of Freiburg.

The abstract of the paper is given below:

Recently, whether environmental regulation impacts upon a country's competitiveness has been gaining more and more attention. With the issue of climate change on a global scale continuing to heat up, new research highlights the growing importance of carbon emission constraints that affect a country's trade competitiveness. Using EU trade data, we found that carbon constraints among EU countries revealed comparative advantages and that they have a significant positive effect. This finding is used by Michael Porter and other advocates of environmental regulation as evidence to enhance the competitiveness hypothesis, rather than supporting the "pollution haven hypothesis." Further sub-sample regression studies show that environmental regulation to enhance the competitiveness of action exists only in non-resource-intensive industries, not in resource-intensive industries. This article studies the field of trade and the environment to create new developments, but also provides important policy implications for developing countries.

At this conference, we met a participant from another AC21 partner, Peking University. Her research is also on trade. We introduced her to our research and the AC21 project. She was very interested, and said she would pass on our project information to her colleagues at Peking University.



4. Shanghai Conference

We joined the KAS-WTO conference on “Trade and Climate Change” held by the Konrad-Adenauer-Stiftung (KAS) on Nov.23, 2013, in Shanghai.

Here is a brief introduction tothe conference, which can be accessed online from the following link: <http://www.kas.de/china/en/events/57231/>

Climate change is one of the greatest challenges the international community is currently facing. Mitigating global warming and adapting to its consequences will require far-reaching changes in global economic frameworks and major economic investment — the future of globalisation will depend on how we shape trade and production patterns towards a climate friendly and sustainable mode.

Against this background, KAS and SUIBE invited a number of international senior experts from the most important global trading nations. They will discuss obstacles and potentials of both existing and emerging trade regimes and theircontribution to mitigatingclimate change. Young Chinese scholars will provide and discuss their latest findings on the topic.

Date: Saturday, November 23, 2013, 8.30 -17.30

Venue: Renaissance Shanghai Yangtze Hotel, Yangtze Ballroom II, Salon A (Level 3), 2099 Yan'An West Road, Shanghai

At the conference, we met Prof. Dajian Zhu from another AC21 partner, Tongji University. He is a famous expert in the field of green economy. In addition, we met several participants from the EU and exchanged research ideas with them.



12th SUIBE-KAS WTO-Conference 2013

Trade and Climate Change

Organized by

Shanghai University of International Business and Economics
Konrad-Adenauer-Stiftung Shanghai

Saturday, 23 November 2013
Renaissance Shanghai Yangtze Hotel
Yangtze Ballroom I, Salon A (Level 3)
2099 Yan'an West Road, Shanghai



5. Guangzhou Conference

We participated in the Conference on Industrial Upgrading and Sustainable Economic Growth in China held by the Chinese Economics Society of Australia (CESA) on Dec 12-13 in Guangzhou. The conference website is as follows:

<http://www.ces-aus.org/2013/12/11/joint-cesa-jinan-university-guangzhou-conference/>.

The focus of this conference was very close to the topic of our project. We presented a paper titled "Is Foreign Direct Investment Sensitive to the Environmental Regulation: Firm Level Evidence from China". The introduction is given below:

At the center of the pollution haven debate is whether foreign investments are impacted by the environmental regulations of developing countries. Most empirical studies try to provide evidence from aggregated data, and are fairly lacking in direct evidence on a microlevel. To fill this gap, this paper tests the intra-country pollution haven effect by estimating the determinants of foreign direct investment in China, using a large firm-level panel data sample. Evidence from this study supports the existence of pollution havens within China in certain cases. However, the sensitivity of foreign investments to environmental regulations varies a lot across different industries of pollution characteristics. Furthermore, we consider the impact of subsidies from the government on foreign direct investment. Results show that subsidies matter a lot to corporate location decision, and outweigh the pollution treatment costs in areas with stricter environmental regulations.

At the conference, we met some participants from another AC21 partner, Peking University. We exchanged research ideas and explored the possibility of future collaboration.



6. Seminar Series

With the generous financial support from AC21, we organized a series of seminars on climate change and trade. The participants were mainly from Nanjing University.

Below are a brief list and some photos of the seminars.

Time	Topic
03.26	Kahn, M. E. (2004). "Domestic pollution havens: evidence from cancer deaths in border counties." <i>Journal of Urban Economics</i> 56(1): 51-
04.02	Jan H. Hoeffler, "Teaching Replication in Quantitative Empirical Economics"
04.02	Aichele, R. and G. Felbermayr (2013). "Estimating the Effects of Kyoto on Bilateral Trade Flows Using Matching Econometrics." <i>The World Economy</i> 36(3): 303-330.
04.09	Manderson, E. and R. Kneller (2011). "Environmental Regulations, Outward FDI and Heterogeneous Firms: Are Countries Used as Pollution Havens?" <i>Environmental and Resource Economics</i> 51(3): 317-352.
04.16	Martínez-Zarzoso, I. and A. Maruotti (2011). "The impact of urbanization on CO2 emissions: Evidence from developing countries." <i>Ecological Economics</i> 70(7): 1344-1353.
04.23	Rezza, A. A. (2013). "FDI and pollution havens: Evidence from the Norwegian manufacturing sector." <i>Ecological Economics</i> 90(0): 140-149.
05.07	Batrakova, S. and R. Davies (2012). "Is there an environmental benefit to being an exporter? Evidence from firm-level data." <i>Review of World Economics</i> 148(3): 449-474.
05.14	Levinson, A. (2009). "Technology, International Trade, and Pollution from US Manufacturing." <i>American Economic Review</i> 99(5): 2177-2192.
05.21	Introduction to the WIOD database
05.28	Tambunlertchai, K., A. Kontoleon, et al. (2012). "Assessing participation in voluntary environmental programmes in the developing world: the role of FDI and export orientation on ISO14001 adoption in Thailand." <i>Applied Economics</i> 45(15): 2039-2048.

06.04	Baghdadi, L., I. Martinez-Zarzoso, et al. "Are RTA agreements with environmental provisions reducing emissions?" <i>Journal of International Economics</i> (0).
06.18	Marconi, D. (2012). "Environmental Regulation and Revealed Comparative Advantages in Europe: Is China a Pollution Haven?" <i>Review of International Economics</i> 20(3): 616-635.
09.10	Prof. Jennifer Te LAI,"Consumption risk sharing and self-insurance across provinces in China: 1952-2008"
10.11	Chen, Y., A. Ebenstein, et al. (2013). "Evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River policy." <i>Proceedings of the National Academy of Sciences</i> .
10.18	Hering, L. and S. Poncet (2012). "Environmental policy and trade performance: Evidence from China." Working paper.
10.25	Chen, Y., G. Z. Jin, et al. (2011). The promise of Beijing: evaluating the impact of the 2008 Olympic games on air quality, JEEM
11.01	Elliott, R. J. R., P. Sun, et al. (2013). "Energy intensity and foreign direct investment: A Chinese city-level study." <i>Energy Economics</i> 40(0): 484-494.





7. Acknowledgements

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