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Should US Amend Its Restrictions on Exporting High-Tech Products to China?

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Introduction

WHETHER THE CHINESE currency RMB has appreciated sufficiently since 2005 is one of the key economic issues nowadays. In July 2005, to reduce its current account surplus (CAS) and avoid sanctions from US and EU, the Chinese government instituted a new currency regime to appreciate the RMB-USD exchange rate. By the end of 2010, this exchange rate has appreciated by more than 20% compared to the old regime level. However, China's CAS is not reduced following the appreciation of RMB (Table 1).

Some critics, such as Athukorala (2009) and Corden (2009), believe this is because the RMB appreciation period coincides with the time that China joined the World Trade Organization (WTO). As joining WTO promotes China's export, it offsets the RMB appreciation effect. Others point out that the tremendous restrictions of developed countries on exporting their high-tech products to China should also be responsible for China's high CAS. They assert that amending these restrictions would speed up China's import growth rate and ameliorate developed countries', especially US's international trade conditions (Wang, 2010). This paper will shed some light on finding efficient ways to reduce US trade deficit with China.

Table 1. China's International Trade and CAS (1 billion USD)

Year	Export	Import	CAS	Year	Export	Import	CAS
2000	249.2	225.1	24.1	2005	762.0	660.0	102.0
2001	266.1	243.6	22.6	2006	968.9	791.5	177.5
2002	325.6	295.2	30.4	2007	1,217.8	956.0	261.8
2003	438.2	412.8	25.5	2008	1,430.7	1,132.6	298.1
2004	593.3	561.2	32.1	2009	1,201.6	1,005.9	195.7

Source: National Bureau of Statistics of China, *Chinese Statistical Yearbook 2010*.

The Model

WE USE THE gravity model, a widely used framework for studying bilateral international trade. Previous studies of using this model to analyze China's international trade issues mostly focus on the impact of China on other countries export (Athukorala, 2009). Unlike these studies, this paper will analyze causes of China's CAS increase.

The basic model in this paper is:

$$\ln Y_i = \mu + \beta_1 \ln GDP_i + \beta_2 \ln GDPCN + \beta_3 \ln PGNI_i + \beta_4 \ln PGNICN + \beta_5 \ln RER_i + \beta_6 \ln\left(\frac{MeanU}{MeanR}\right) + \beta_7 Border_i + \beta_8 HMT_i + \beta_9 Culture_i + \beta_{10} WestDEVELOP_i + \beta_{11} OAsia_i + \beta_{12} Africa_i + \beta_{13} EastEurope_i + \beta_{14} Resource_i + \epsilon$$

The variable explanations are displayed in Table 2.

Table 2. Explanation of Variables in the Model

Variable	Explanation
Y_i	China's real import from or export to country *i*
GDP_i	Real GDP of country *i*
$GDPCN$	Real GDP of China
PGN_i	Real GNI per capita of country *i*
$PGNICN$	Real GNI per capita of China
RER_i	Real exchange rate between China and country *i*
$MeanU/MeanR$	Mean income ratio of urban and rural areas in China
$Border_i$	Dummy variable which is 1 if China and country *i* share a land border, 0 otherwise
HMT_i	Dummy variable which is if country *i* is Hong Kong, Macao or Taiwan (HMT), 0 otherwise
$Culture_i$	Dummy variable which is 1 if country *i* is a eastern or southeastern Asian country that has close culture to China (other than HMT), 0 otherwise;
$West\ DEVELOP_i$	Dummy variable which is 1 if *i* is a non-Asian developed country, and 0 otherwise
$Other\ Asia_i$	Dummy variable which is 1 if the country *i* is in Asia but does not share a land border or have close culture to China, 0 otherwise
$Africa_i$	Dummy variable which is if country *i* is an African country, 0 otherwise
$East\ Europe_i$	Dummy variable which is if country *i* is in East Europe (except Russia, which shares a long land border to China), 0 otherwise
$Resource_i$	Dummy variable which is if country *i* is resource exporting country, 0 otherwise

Data

THE TIME RANGE of the data is from 2002 to 2008, the first seven years after China joined the WTO. Data on China's imports and exports, as well as China, Hong Kong, Macao and Taiwan's GDP and PGDP are gathered from the Chinese Statistical Yearbook 2003-2009. The China urban and rural mean incomes are from Jin (2011). Other data are collected from the World Bank's World Development Indicators (WDI) database. The real values are obtained by deflating the nominal values by the US GDP price index extracted from the WDI database.

We selected 84 countries based on the following criteria: 1) each country should account for at least 0.05% of China's international trade in 2008 and 2) required data is available on the WDI database. The countries in our study cover nearly 90% of China's total import and 95% of China's total export.

Results

TO REMOVE THE possible effects of hetero- scedasticity, we applied GLS estimation method. The results are shown in Table 3. From these results, we can see that while culture has the largest impact on China's import, it is only the fourth most important factor on China's export. As a result, it has the second largest impact on China's net import, right next to resource.

Surprisingly, we found China's import growth with HMT is much slower than those with the other eastern countries. As HMT is much closer to China both geographically and culturally, there must be other dominating factors that caused this phenomenon. A possible interpretation could be China's increasing demand for the high-tech products. As China cannot obtain enough high-tech products from western developed countries, it mainly relies on eastern and southeastern countries, which have looser restrictions, to import those products.

Therefore, comparing to urging RMB to appreciate, amending restrictions on exporting high-tech products to China may be a more efficient way for US to reduce its deficit. Rather than largely relying on eastern and south-eastern Asian country for its high-tech products, China will also import a considerable proportion from US due to its price advantage.

Table 3. Impacts of Different Factors on China's Imports and Exports

Explanary Variables	Imports	Exports	Estimates Difference
Log GDP	0.85***	0.72***	0.13
Log GDPCN	1.61***	2.47***	-0.86
Log PGNI	0.12***	0.01	0.12
Log RER	1.91***	2.02***	-0.11
Log MeanU/MeanR	-1.26**	-0.84**	-0.42
Border	0.53***	1.05***	-0.52
HMT	2.10***	1.59***	0.51
Culture	3.12***	1.44***	1.68
WestDEVELOP	0.20***	-0.02	0.20
Other Asia	-0.00	0.71***	-0.71
Africa	0.15**	0.30***	-0.15
East Europe	-0.50***	-0.16***	-0.34
Resource	2.09***	-0.34***	2.43
Constant	-17.82***	-26.14***	
R-squred	0.9986	0.9995	
N	588	588	

Significance level: ***1% **5% *10%

Conclusions

IN THIS PAPER, we analyzed China's CAS after it joined the WTO based on a gravity model. The result showed that RMB appreciation will increase both of China's import and export and hence is not an ideal way to reduce US' trade deficit to China. However, amending restrictions on exporting high-tech products to China may be a feasible way for US to achieve this goal.

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