

Impacts of FTAs on Agricultural Products Export of China

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This paper is to analyze impacts of free trade agreements (FTAs) on China's agricultural products, export and the influencing factors especially associated with the FTA. Based on China's FTA network and its planning, 15 China FTA partners and 16 non-FTA partners are selected as the representatives, uses micro-founded model to measure China's agricultural products export costs during 2002~2013. Then, use the multiple regression model to observe how FTAs impact on China's agricultural products export through trade costs. It finds that FTA is significantly and negatively relating to China's agricultural products export.costs. Tariff concession, trade facilitation and SPS are with the opposite influences. To accelerate and promote FTA under negotiation is very important to improve China's agricultural products export.

Keywords FTA; Agricultural products Export; Trade Costs; Trade Facilitation; Tariff Concession

INTRODUCTION

Whatever developed or developing countries currently strengthen economic and trade ties with other countries (regions). Multinational negotiation conducted by the WTO was suffered by repeated setbacks. Regional Free Trade Agreements (FTAs) have already become a new trend of world trade liberalization. FTA is deemed as a new platform to further open up to the outside world and to speed up domestic reforms, an effective approach to integrate into the global economy and strengthen economic cooperation with other economies, and, particularly, an important supplement to the multilateral trading system. FTA involves multiple fields including goods, services, investment, agriculture, labor, environment, government procurement, intellectual property protection, safeguard mechanism, technical barriers to trade

(TBT), sanitary and phytosanitary standards (SPS) and trade facilitation, etc. FTA aims to trade liberation and decrease trade costs. Tariff concession is the inevitable result of trade liberation and the main part of market access of agricultural products. Tariff, TBT, SPS and trade facilitation are associated with the FTA and trade costs.

Agriculture is the emphasis and difficulty of FTA negotiation. Agricultural products trade is always one of the main disagreements of FTA negotiation (Zhang, 2012). Available evidence suggests that agricultural products face higher trading costs than manufacturing products due to more stringent and numerous border procedures, physical inspections and sanitary and phytosanitary standards and to the perishable nature of many agricultural products which

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entail a higher sensitivity to delivery delays (OECD, 2009a; Moisé and Le Bris, 2013; Tao, 2013). As a large agriculture country, China's agricultural products market has been merged into the world market and push forward to more comprehensive liberalization. While, China's agricultural products imports increased much faster than exports. China had been changed from a surplus nation of agricultural products to a deficit one. It can be considered that China's agriculture products trade faces great pressure. How to decrease trade costs of agricultural products exports is very important for China. This study has an analysis on the impacts of FTAs on China's agricultural products export.

Up to Jul 10, 2016, besides Asia-Pacific trade agreement, China had signed 13 free trade agreements (FTAs) with 21 partners. 8 agreements are launched negotiation and 5 agreements are under consideration. The details of China's FTA network and plan can be found in Table 1. To consider data availability of 2002~2013, 31 representing partners of China were selected for this study (details see Table 2) and were shared into four groups for a comparative analysis. Group 1 includes 15 FTAs partners of China in 2013. Group 2, 3 and 4 include 16 non-FTA partners of China in 2013. Group 2 contains 7 partners with FTA negotiation launched. Group 3 contains 2 partners with FTA consideration. Group 4 contains 7 partners with non-FTA plan. Because China-ROK FTA and China-Australia FTA was signed in Jun, 2015, Korea and Australia are put into group 2. Firstly, in order to know which partner has experienced the fastest declines in trade costs and the difference of trade costs changed between FTA partners & non FTA partners, this study uses Novy (2007, 2011)'s micro-founded model to measure China's agricultural products export costs to 31 partners from 2002 to 2013. Secondly, use multiple regression to understand how the FTA impact on China's agricultural products export through trade costs. Thirdly, have an analysis on how China improve improves the strategies of FTAs negotiations and/or agricultural products exports.

This study is divided into six sections, including the present introductory one. A literatures literature review used to fulfill the needs of the study is discussed in Section 2. The basic information on China's agricultural products export is discussed in Section 3. Section 4 is to estimated estimate China's agricultural products, export costs and has a comparison analysis. Section 5 has a quantitative analysis to pin points the impacts of FTAs on China's agricultural products exports. The last is main conclusion and suggestions of the study.

LITERATURES REVIEW

Xu et al. (2012) stated that the average costs of China's agricultural products exports were keeping downward during 1996~2009, especially the labor intensity agricultural products. The agricultural product trade costs between China and Japan, USA are lower than that of between China with ASEAN and EU. Trade costs of agriculture products are higher than manufacture products. TBT becomes the primary barrier of China's agricultural products export. To decrease the absolute value of agricultural product trade costs between China and its main partners are benefit to adjusting the imbalance of China's import and export of agricultural products and its deficit status. It is realized that trade costs changing is different between different partners. Variant trade promotes measure should be applied by different markets.

Some scholars stated that China needs to adjust FTA strategies and enhance FTA on trade. Chen et al. (2015) stated that China's FTA strategies are still in the shallow

integration stage and need to be in deep cooperation and integration. Zhao et al. (2013) predicted that China-Japan-Korea FTA will improve Japan's trade term and can't solve China's problems, such as bottom industrial structure, low technology and lacking innovation. The price advantages of most China's agricultural products would not get inverted after effectiveness of Korea-U.S. FTA. The FTA has little impact on China's agricultural products export to Korea and Korea can be predicted that he will present a conservative plan for China-Korea agriculture negotiation. China is necessary to balance comprehensive effect of all industries and make appropriate decisions. Zhao (2014) thought that China needs to set up a set of clear FTA strategies to face new rules of international trade and investment and regional groups' challenge. Sheng and Guo (2014) stated that China must pay more attention on significant impact and role of Second generation trade policies in FTAs, push deep domestic reform gradually and ensure China's core interests and strategic initiatives in global economic governance.

AGRICULTURAL PRODUCTS EXPORT OF CHINA

The WTO agreement on agriculture defines agriculture products in its Annex 1 by reference to the Harmonized System of product classification, including all of the products under HS01~24 and part of products under HS29, 33, 35, 38, 41, 43, 50, 51, 52 and 53, except for fish and fish products. As fish and fish products are the one of the largest import and export products of China, this study uses classification of the Development Research Center of the State Council (SCDRC) of China. It covers all products under HS01~24 including fish and fish products. Whatever WTO classification or SCDRC classification, forestry products are not included. Table 3 shows the description of agriculture products and their HS Codes. This part analyzes trade flows and position of China's agricultural products trade, composition of import and export and bilateral exports of agriculture products between China and its main partners. Data comes from UN comtrade Database.

From 2002 to 2013, across the range of imports and exports, China's agricultural product trade has increased rapidly. Except for financial crisis in 2009, China agricultural products export value increased yearly from USD17.400 billion to USD 65.366 billion, import value increased from USD10.332 billion to USD100.649 billion. Although China is a surplus nation of total commodity trade during 2002~2013, its agricultural products trade changed from surplus in 2002~2007 to deficit from 2008. The deficit appeared in 2008 with USD7.390 billion and the figure rose to USD35.283 billion in 2013. The share of China's agricultural products import to total commodity imports was increased from 3.50% in 2002 to 5.16% in 2013. While, its share of exports decreased gradually from 5.34% to 2.96%. Details please find in table 4.

With no doubt, the above partners are very important to China's agricultural products trade. Values of bilateral agricultural products export are increasing gradually during 2002~2013 (see Table 5). The ratio of China's agricultural products export to 31 partners of China's total agricultural products export to the world was keeping more than 82%. The ratio of 31 partners exported agricultural products to China of their total agriculture products export to the world was increasing gradually from 4.0% in 2002 to 10.0% in 2013. China was keeping deficit of agricultural products trade with partners under FTA consideration, FTA signed as well as non-FTA plan during 2002~2013. However, China was keeping surplus with partners under FTA negotiation, although the

surplus amount was decreasing yearly. The ratio of China export to the partners with FTA signed, non-FTA plan was increasing gradually from 18%, 23% to 26%, 30% respectively. In 2013, the ratio of China export to partners with FTA consideration was only about 0.1%. The ratio of China export to the partners with FTA negotiation was decreasing sharply from 46% to 26%. It is especially crucial how to change the constraint of agricultural products export from China to its partners with FTA under negotiation.

Measuring Trade Costs of China's Agricultural Product Export

This study uses Novy (2007, 2011)'s micro-founded model to estimate China's agricultural products export cost to its representing partners from 2002 to 2013 as per the following formula (1). Data sources, please find in Table 5.

$$\Gamma_{ijt} = 1 - \left[\frac{X_{ijt}X_{jtt}}{(Y_{it}-X_{it})(Y_{jt}-X_{jt})s^2} \right]^{\frac{1}{2\rho-2}}$$

i : China

j : Partners

t : Year

Γ_{ijt} : China's agricultural products export

Y_{it} , Y_{jt} : Value of (GDP- service value added)

current USD of i , j in Year t

X_{ijt} : Actual export Value of i exports to j for agricultural products in year t

X_{jtt} : Actual export Value of j exports to i for agricultural products in year t

ρ : Elasticity of substitution

This study regards the share of tradable agriculture products "s" and the elasticity of substitution of two nations (regions) as equal. In order to investigate the elasticity of substitution and the share of tradable agriculture products influence on export cost, this study sets the value of the elasticity of substitution as 5 (low), 8 (middle) and 10 (high), the share value of tradable agriculture products as 0.3, 0.5 and 0.8 respectively for analysis because the assortment of (s,) between China and developed/developing countries may be different. In addition, this study uses , as the value of (GDP-service value added) current USD other than use GDP current USD directly in Fang et al.(2010), Xu et al. (2012) and Novy (2007, 2011)'s.

The absolute values of China's agricultural products, export cost (Hereafter briefly as EC) to its representing partners are quiet difference under different assortment of (s,) including (0.3,5), (0.3,8), (0.3, 10), (0.5,5), (0.5,8), (0.5,10), (0.8, 5), (0.8,8) and (0.8, 10) during 2002~2013. The export costs changed sensitively under a different assortment of (s,) but never changed the trend. The value of the EC (0.5, 8) is in the middle. In order to observe EC values and its trend earlier, this study sets a benchmark as index=100 as per the absolute value of trade costs EC (0.5, 8) between China and USA in 2002. Then change all the absolute values of bilateral trade costs into indexes. For example, EC (0.3, 5), (0.3, 8), (0.3, 10), (0.5, 5), (0.5, 8), (0.5, 10), (0.8, 5), (0.8, 8) and (0.8, 10)

indexes between China and USA in 2002 were 129.4, 94.5, 79.5, 134.5, 100, 84.6, 138.7, 104.7 and 89.1 respectively. EC (0.5, 8) index in 2013 is 89. So, in 2002, EC (0.8, 5), (0.5, 5), (0.3, 5), (0.8, 8) were 38.7%, 34.5%, 29.4% and 4.7% higher than EC (0.5, 8), while EC (0.3, 8), (0.8, 10), (0.5, 10) and (0.3, 10) were 5.5%, 10.9%, 15.4% and 20.5% lower than EC (0.5, 8) respectively. EC (0.5, 8) in 2013 is lower 11% than in 2002.

Based on the index value of EC (0.5, 8), it can be found that only EC to Hong Kong, Vietnam, Indonesia and Korea are lower than in the USA in 2002. In 2013, EC of 15 partners were lower than 100 including the USA. While, Japan's 102.9, Korea's 98.0 and ASEAN 7's average index 98 are all higher than USA's 89. The conclusion is different with Tao (2013). EC to partners of Africa (South Africa, Nigeria), North Europe (Sweden, Switzerland, Iceland and Norway), South America (Costa Rica, Colombia, Peru, Chile), GCC (Oman, UAE) and South Asia (Sri Lanka, India, Pakistan) were still very high. EC to Thailand, Korea and Indonesia were close to the USA. Only Hong Kong and Vietnam keep lower than USA in 2002~ 2013. EC to Korea, Indonesia changed from lower to higher than that to USA. EC to Cambodia was the highest among ASEAN 7 partners.

As per the decreasing rate, it can be found that EC had been decreasing gradually during 2002~2013 excluding Japan. EC in Japan was the only exception with increasing 1.8%. The simple average decreasing rate of ECs to partners with non-FTA plan, FTA signed, FTA negotiation and FTA consideration were respectively of 8.8%, 7.4%, 4.1% and 2.0%. Brazil was the top 1 with the highest decreasing rate of 16.4%. On the opposites, Hong Kong became the lowest decreasing of 0.5% but with the lowest value of the EC. With the combination of EC indexes and its decreasing rate between 2002~2013, it can find that:

i. EC to Hong Kong, New Zealand, USA, EU, Canada, Brazil, Korea, Australia, Thailand, Vietnam, Indonesia, Malaysia, Philippine were keeping improvement.

ii. EC to Chile, Pakistan, Costa Rica, Nigeria, Sri Lanka, UAE and Cambodia had a sharply decreasing rate and their EC indexes were still very high.

iii. Peru, Iceland, Switzerland, South Africa, Norway, Oman, India and Colombia were with high EC indexes and less EC decreasing.

iv. Japan, Russia and Singapore's EC indexes of 2013 were very close but with quite difference decreasing rate during 2002~2013.

The above statements all covered China's agricultural products export partners with FTA signed, FTA negotiation, FTA consideration and non-FTA plan. With a comparison analysis on the EC to FTA partners and non-FTA partners, except for Russia's decreasing 2.8% and South Africa's 3.2%, EC to other non-FTA partners decreased sharply, including Brazil's 16.4%, USA's 11.0%, EU's 9.6%, Canada's 8.9% and Nigeria's 10.0%, while FTA partners such as New Zealand, Costa Rica, Chile and ASEAN 7 were decreased 12.5%, 10.9%, 10.6% and 8.3 respectively. It seems that China's FTA had little impact on agricultural products export during 2002~2013.

Impacts of FTA on China's Agricultural Products Export

Further, in order to measure impacts of FTAs on China's agricultural products export, this study uses multiple regression model as per the following formula (2) to understand how FTA impact on agricultural products export through trade costs.

Γ_{ijt} & i , j , t are same as formula (1).

$$\ln \Gamma_{ijt} = c_{ij} + \beta_1 \ln Dis_{tan\ ce_{ij}} + \beta_2 \ln Tariff_{ijt} + \beta_3 \ln Tariff_{ijt} + \beta_4 \ln Rate_t + \beta_5 \ln Doc_{it} + \beta_6 \ln Doc_{jt} \\ + \beta_7 \ln SPS_{jt} + \beta_8 FTA_{ij} + \beta_9 High_j + \beta_{10} History_{ij} + \beta_{11} Adj_{ij} + \beta_{12} Lan_{ij} + \varepsilon_{ijt}$$

The dependent variable is the logarithmic of export costs measure $\ln(\Gamma_{ijt})$ and be calculated on the basis of EC (0.5, 8) of USA in 2002 as index=100. FTA_{ij} , Lan_{ij} , ADJ_{ij} , $History_{ij}$, $High_j$ are dummy variables, denote respectively if China i and its partner j had signed a free trade agreement, if they are use same language, if they share a common land border (adjacency), if they are once belong to a same country in the history and if partner j was a high income nation in 2013. $Dis_{tan\ ce_{ij}}$ denotes China and its partner's capital physical distance. $Rate_t$ denotes the exchange rate to USD of China and partner j . SPS_{jt} denotes numbers of notification of the partner for sanitary and phytosanitary standards. Doc_{it} & Doc_{jt} denote China and its partner's total numbers of documents to export and import respectively (TNDEI), they are used as the indicators of trade facilitation and also can be as substitution variables of the regime. $Tariff_{ijt}$ & $Tariff_{ijt}$ denote China and its partner's agricultural product import tariffs. c_{ij} is the constant term and ε_{ijt} is random variable. $\beta_1 - \beta_{12}$ are coefficients to be estimated. Data source details please see Table 6.

With 9 regressions relating to different bilateral trade costs of agricultural products under different assortment of trade products share and substitute elasticity (s,) including (0.3, 5), (0.3, 8), (0.3, 10), (0.5, 5), (0.5, 8), (0.5, 10), (0.8, 5), (0.8, 8) and (0.8, 10), it found that the trade costs measure is sensibly under a different assortment of (s,), especially influenced by substitution elasticity. Four explanatory variables, including FTA, partner's tariff, China's tariff and total number of Documents to exports and imports (TNDEI) of China have the expected signs whenever significant. Partner's tariff and China's tariff & TNDEI are positively related to trade costs, whereas FTA is associated with lower trade costs.

The coefficient of same significant variable has difference response to a different assortment of (s,). For example, the coefficient of FTA under =10 and 8 are lower than =5. The highest is -1.006 under EC (0.8, 5) and the lowest is -1.606 under EC (0.3, 8). FTA under =5 is significant at the 5% level, while at the 1% level under =8, 10. Moreover, exchange rate and language under EC (0.8, 5), (0.5, 5) and (0.3, 5) are significant under 5% level and negatively related to trade costs. Language under EC (0.8, 8), (0.5, 8) and (0.3, 8) is significantly under 10% level and negatively related to trade costs. Other explanatory variables, including distance, SPS, partner's TNDEI, adjacency and history are all not significant. It means that bilateral FTA signed is much more benefit to decrease trade costs if China and its partner with High of agricultural products. Exchange rate and language under high isn't significant. The exchange rate is significant only under low. Language is significant under low and middle. The lower with higher constant value means higher fixed costs existed in bilateral agricultural products trade.

CONCLUSION & SUGGESTIONS

The ratio of China's agricultural products export to 31 partners of China's total agricultural products export to the world is

keeping more than 82% in 2002~2013. The ratio of 31 partners export agricultural products to China of their total agriculture products export to the world is increasing gradually from 4.0% to 10.0%. Without doubt, 31 representing partners are very important to China's agricultural products trade, and vice versa. China is dependent on 31 representing partners well, especially partners with FTA under negotiation, non-FTA plan and FTA signed. China is keeping continuous growth of agricultural products exports to partner with FTA signed and partners with non-FTA plan but with greater deficit. China's export market composition of agricultural products is very stubborn.

China's agricultural product export costs has been decreasing gradually during 2002~2013. Generally, the simple average EC to FTA partner and its decreasing rate are lower than that to non-FTA partner. China's agricultural products export costs are sensibly under a different assortment of share of tradable agriculture products & elasticity of substitute (s,), especially influenced by the elasticity of substitute but never change the trend. Value of EC (0.5, 8) is in the middle, higher than EC (0.3, 8), (0.3, 10), (0.8, 10), (0.5, 10) and lower than EC (0.3, 5), (0.5, 5), (0.8, 8), (0.8, 5), can reflect the basic situation of China's agricultural products export costs. The conclusion is other than Jacks et al (2011) and Xu and Liang (2010)'s set s = 0.8 and Fang et al.(2010)'s set =10.

FTA is significant with negative sign under 1% level when =8, 10 or under 5% level when =5. Partner's tariff and China's TNDEI are significant under 1% level. China's tariff is significantly under 5% level (=5) or 10% level (=8, 10). The exchange rate is significant and positive under 5% level when =5. Language are significant and positive under 5% level (=5) or under 10% level (=8). FTAs associate with tariff concession, trade facilitation and SPS, etc. The low coefficient (negative sign) of FTA on trade costs of China's agricultural products export corresponds to higher coefficient (positive sign) of partner's tariff, China's tariff & China's TNDEI.

SUGGESTIONS

China has taken shape Asia-Pacific FTA network to compatible with the Trans-Pacific Partnership (TPP) and Transatlantic trade and investment partnership (TTIP) dominated by USA, regard China-ROK FTA, China-New Zealand FTA, China-Australia FTA, China-Switzerland FTA, China-Iceland FTA, China-Norway FTA, China-Peru FTA, China-Chile FTA, China-Colombia FTA and China-Costa Rica FTA as the endpoints, be made of RECP (10+6), North Europe (4) and South America (4), line link to ASEAN 10, Japan, Korea, Australia, New Zealand, India and Switzerland, Iceland, Norway, Costa Rica, Peru, Colombia, Chile and covers all Asia-Pacific member excluding Canada, USA, Mexico and Russia. Based on the successful programs in China and ASEAN, New Zealand and Chile, Peru, Costa Rica FTA, it is confident that China can succeed in the others. China has achieved the obvious effect on FTA construction in South America, South-East Asia, South Asia, East Asia, Oceania and North Europe. China shall expand partners with FTA under negotiation into FTA partners' basket, especially high income partners such as Japan, GCC and Norway.

China shall consider carefully, clearly and take different strategies in the further FTA negotiation. The status of China's agricultural products export is going down. It may be caused by China's supply and demand imbalance of land intensity agriculture products, cut down import tariffs and increase quotas as well as degradation of the agricultural export environment. China may push multiplex strategies such as

implement of agricultural product import substitution, advancing quality and diversifying markets and products to improve elasticity of a substitute. It is especially crucial how to change the constraint of agricultural products exports between China and partners with FTA under negotiation. Increasing substitute elasticity or decrease share of tradable is benefit to decrease trade costs. It is necessary for China to further cut down tariff of importing agricultural products from high income

partners, including Asian high income partners and ask the partners for more tariff concession of importing from China including ASEAN partners. China shall improve the level of trade facilitation and ask the partners same.

Table 1 FTAs signed, under negotiation and consideration of China

Progress	FTA	Remarks
FTA Signed	China-ASEAN	The agreement on trade in Goods of China-ASEAN FTA Signed in Nov, 2004 and effected in Jul 01, 2005
	China-Pakistan	Signed in Nov, 2006 and effected in Jul, 2007
	China-Chile	Signed in Nov, 2005 and effected in Oct, 2006
	China-New Zealand	Signed in Apr, 2008 and effected in Oct, 2008
	China-Singapore	Signed in Oct, 2008
	China-Peru	Signed in Apr, 2009 and effected in Mar, 2010
	Mainland and Hong Kong Closer Economic and Partnership Arrangement (CEPA)	Signed in Sept, 2003 and effected in Jan, 2004
	Mainland and Macau Closer Economic and Partnership Arrangement (CEPA)	Signed in Oct, 2003 and effected in Jan, 2005
	China-Costa Rica	Signed in Apr, 2010 and effected in Aug, 2014
	China-Iceland, 2013	Signed in Apr, 2013 and effected in Jul, 2014
FTA under Negotiation	China-Switzerland, 2013	Signed in Jul, 2013 and effected in Jul, 2014
	China-ROK, 2015	Signed on Jun 01, 2015
	China-Australia, 2015	Signed on Jun 17, 2015
	China-GCC (Gulf Cooperation Council)	Launched in Jul, 2004
	China-Norway	Launched in 2007
	China-Japan-Korea	Launched in Nov, 2012
	Regional Comprehensive Economic Partnership, RCEP	Launched in Nov, 2012
	China-ASEAN FTA Upgrade Negotiations	Launched in Aug, 2014
	China-Sri Lanka	Launched in Sept, 2014
	China-Maldives FTA	Launched in Feb,2015
FTA under Consideration	China-Geogria FTA	Launched in Dec,2015
	China-India Regional Trade arrangement Joint Feasibility Study	
	China-Columbia FTA Joint Feasibility Study	
	China-Moldova FTA Joint Feasibility Study	
	China-Fiji FTA Joint Feasibility Study	
	China-NePal FTA Joint Feasibility Study	Start in Mar, 2016

(<http://fta.mofcom.gov.cn/list/chinageorgiaen/chinageorgiaennews/1/encateinfo.html>, Jul 10,2016)

Table 2 31 Representing Partners and their Geographical Distribution

Group		Area	Representing Partners	Excluding partners	
Group 1	Partners: FTA signed	South-East Asia (ASEAN10)	Singapore	Laos	
			Indonesia	Myanmar	
			Malaysia	Brunei Darussalam	
			Vietnam		
			Cambodia		
			Philippine		
			Thailand		
			North-East Asia	Hong Kong	Macao
					Korea
				South Asia	Pakistan
	Oceania	New Zealand	Australia		
	South America	Chile			
		Peru			
		Costa Rica			
	Europe	Switzerland			
	Europe	Iceland			
	North-East Asia	Japan			
		Korea			
	South Asia	Sri Lanka			
Group 2	Partners: FTA under negotiation	Oceania	Australia		
		GCC	Oman	Kuwait	
			United Arab Emirates	Bahrain	
			Qatar		
Group 3	Partners: FTA under consideration	Europe	Norway		
		South Asia	India	Maldives	
Group 4	Partners: Non-FTA plan	North America	USA		
			Canada		
			Brazil		
			Europe	EU-28	
				Russia	
	Africa	South Africa			
		Nigeria			

Table 3 Agricultural products' Name and Description of HS 01~24

HS Code	Name of agriculture product
1	Live animals
2	Meat and edible meat offal
3	Fish, crustaceans, molluscs, aquatic invertebrates nes
4	Dairy products, eggs, honey, edible animal product nes
5	Products of animal origin, nes
6	Live trees, plants, bulbs, roots, cut flowers etc
7	Edible vegetables and certain roots and tubers
8	Edible fruit, nuts, peel of citrus fruit, melons
9	Coffee, tea, mate and spices
10	Cereals
11	Milling products, malt, starches, inulin, wheat gluten
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes
13	Lac, gums, resins, vegetable saps and extracts nes
14	Vegetable plaiting materials, vegetable products nes
15	Animal, vegetable fats and oils, cleavage products, etc
16	Meat, fish and seafood food preparations nes
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Cereal, flour, starch, milk preparations and products
20	Vegetable, fruit, nut, etc food preparations
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar
23	Residues, wastes of food industry, animal fodder
24	Tobacco and manufactured tobacco substitutes

Table 4 Export & Imports Value of China's Agricultural Products and All Commodity

Year	Total Export (Million USD)		Total Import (Million USD)		Surplus (Million USD)		Share (%)	
	Agricultural Products	Commodity total	Agricultural Products	Commodity total	Agricultural Products	Commodity total	Exp	Imp
2002	17400.415	325595.970	10331.861	295170.104	7068.555	30425.866	5.34	3.50
2003	20641.019	438227.767	15511.201	412759.796	5129.818	25467.971	4.71	3.76
2004	22477.699	593325.581	21492.589	561228.748	985.109	32096.833	3.79	3.83
2005	26462.928	761953.410	22096.445	659952.762	4366.483	102000.647	3.47	3.35
2006	30212.294	968935.601	23557.841	791460.868	6654.453	177474.733	3.12	2.98
2007	35464.627	1220059.669	33121.808	956115.448	2342.818	263944.221	2.91	3.46
2008	38829.955	1430693.066	46220.037	1132562.161	-7390.082	298130.905	2.71	4.08
2009	38216.869	1201646.758	50163.489	1005555.225	-11946.621	196091.533	3.18	4.99
2010	47626.217	1577763.751	61068.191	1396001.565	-13441.974	181762.186	3.02	4.37
2011	58618.958	1898388.435	76651.675	1743394.866	-18032.718	154993.569	3.09	4.40
2012	61092.719	2048782.233	91976.633	1818199.228	-30883.914	230583.005	2.98	5.06
2013	65365.904	2209007.280	100649.030	1949992.315	-35283.126	259014.965	2.96	5.16

Table 5 Bilateral Agricultural Products Trade between China and its Partners

		Year											
FTA Progress		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
China Exports To Partners (Billion USD)	Consideration	84.85	70.24	71.92	81.77	145.30	158.61	226.38	346.23	368.55	418.41	453.37	481.15
	Negotiation	7926.37	8861.91	9896.01	11277.50	11701.71	12713.70	11756.52	11446.37	13876.53	16484.12	17515.00	17054.55
	Signed	3176.21	3577.45	3994.00	4340.21	4813.81	5919.13	6797.84	7749.72	10148.13	13453.56	14427.56	16722.21
	Non-FTA	4044.22	5298.33	5844.76	7467.40	9561.83	11745.47	13875.30	12719.07	15585.14	18558.43	18647.00	19434.41
	Total	15231.65	17807.93	19806.69	23166.88	26222.66	30536.91	32656.03	32261.39	39978.36	48914.53	51042.93	53692.32
Partners Export to China (Billion USD)	Consideration	145.14	166.56	170.91	309.47	420.66	500.36	497.20	464.76	864.71	1177.26	1086.64	1060.63
	Negotiation	945.48	922.36	1338.60	1464.27	1507.34	1658.50	2472.00	2174.35	3066.01	4077.14	4577.73	6074.35
	FTA Signed	4710.80	5373.42	6170.39	6262.89	7719.25	10046.90	13437.34	13664.79	16998.51	22356.27	24766.50	25835.64
	Non-FTA	3661.60	7281.50	8947.96	8766.54	10325.17	14813.52	22946.53	26121.78	32846.86	40340.81	52619.34	59114.83
	Total	9463.03	13743.85	16627.87	16803.18	19972.42	27019.27	39353.07	42425.68	53776.09	67951.48	83050.22	92085.46
China 's Total Exports to World (Billion USD)		17400.42	20641.02	22477.70	26462.93	30212.29	35464.63	38829.96	38216.87	47626.22	58618.96	61092.72	65365.90
Partners Export to World (Billion USD)	Consideration	9665.05	9928.09	11885.45	14193.63	15922.61	19958.22	25492.18	20653.79	24055.84	36848.81	44299.06	47758.31
	Negotiation	25803.04	25162.90	32277.27	33478.95	35404.35	37454.43	44728.18	43237.43	51148.43	60784.19	62591.89	66128.21
	Signed	56264.10	64192.89	74371.85	80673.22	90572.12	113458.93	147621.61	129913.16	157015.36	198805.16	196855.72	198049.48
	Non-FTA	167088.42	192738.20	225637.00	250997.78	283954.18	341647.78	425695.35	357839.65	427939.07	533581.38	552191.56	601808.88
	Total	258820.61	292022.07	344171.57	379343.57	425853.27	512519.36	643537.32	551644.04	660158.70	830019.54	855938.23	913744.89
Ratio of China's export	Consideration	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	Negotiation	0.46	0.43	0.44	0.43	0.39	0.36	0.30	0.30	0.29	0.28	0.29	0.26
	Signed	0.18	0.17	0.18	0.16	0.16	0.17	0.18	0.20	0.21	0.23	0.24	0.26
	Non-FTA	0.23	0.26	0.26	0.28	0.32	0.33	0.36	0.33	0.33	0.32	0.31	0.30
	Total	0.88	0.86	0.88	0.88	0.87	0.86	0.84	0.84	0.84	0.83	0.84	0.82
Ratio of Partner's export	Consideration	0.02	0.02	0.01	0.02	0.03	0.03	0.02	0.02	0.04	0.03	0.02	0.02
	Negotiation	0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.05	0.06	0.07	0.07	0.09
	Signed	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.11	0.11	0.11	0.13	0.13
	Non-FTA	0.02	0.04	0.04	0.03	0.04	0.04	0.05	0.07	0.08	0.08	0.10	0.10
	Total	0.04	0.05	0.05	0.04	0.05	0.05	0.06	0.08	0.08	0.08	0.10	0.10

Remarks: i. Group 1: Partners with FTA signed included Singapore, Indonesia, Malaysia, Vietnam, Cambodia, Philippine, Thailand, Hong Kong, Pakistan, Costa Rica, Peru, Chile, New Zealand, Iceland and Switzerland. ii. Group 2: Partners with FTA negotiation included Japan, Korea, Norway, Australia, Sri Lanka, Oman and UAE. iii. Group 3: Partners with FTA consideration included India and Columbia. iv. Group 4: Partners with non-FTA plan included USA, EU, Canada, Brazil, Russia, South Africa and Nigeria: v. Value: Total value of China exported to each group or each group exported to China. vi. Ratio: Total value of China exported to each group/China's total exports to world; total value of each group exported to China/Each group's total export to world.

Table 6 Data and Its Sources

Variable	Definition	Year	Source						
	t : Year; i : China; j : Partners of China's Agriculture products export	2002-2013							
Γ_{ijt}	China's agricultural products export costs to partner j in year t	2002-2013	Authors						
Y_{it}, Y_{jt}	(GDP - service value added) current USD value of China and its partner j respectively in year t	2002-2013	World Development Indicators						
X_{ijt}	Actual export Value of China's agricultural products to j in year t	2002-2013	Uncomtrade database						
X_{jit}	Actual export Value of j exports agricultural products to China in year t	2002-2013	Data is denominated in U.S. dollars.						
ρ	Elasticity of substitution	na	$\rho = 5, 8, 10$						
s	The share of tradable agriculture products between China and j	na	$s = 3, 5, 8$						
$Distance_{ij}$	Great circle distance between two principal cities of China and j	na	CEPII						
$Language_{ij}$	Common Language. Dummy variable. Value 1 if China and j share a common official language; Value 0, otherwise	na	CEPII						
Adj_{ij}	Common Border. Dummy variable, Value 1 if China and j share a common land border; Value 0, otherwise	na	CEPII						
$SameCountry_{ij}$	Same Country. Dummy variable. Value 1 if China and j once belonged to a same country; Value 0, otherwise.	na	CEPII						
$Tariff_{ijt}$	Simple average tariff of China import animal, vegetable and food products from j in year t	2002-2013	Sorted out from http://www.macmap.org/AdvancedSearch/TariffAndTrade/Default.aspx						
$Tariff_{jit}$	Simple average tariff of j import animal, vegetable and food products from China in year t	2002-2013	Sorted out from http://www.tbt-sps.gov.cn/tbtTbcx/getList.action						
SPS_{jt}	Number of notification for SPS by j in year t	2002-2013	Sorted out from http://www.tbt-sps.gov.cn/tbtTbcx/getList.action						
FTA_{ijt}	FTA. Dummy variable. Value 1 if China and j had signed free trade agreement; Value 0, otherwise	2002-2013	See Table 1						
$Rate_{it}$	Exchange rate of China, j 's exchange rate to USD	2002-2013	World Development Indicators						
DOC_{it}	Total number of documents to Export and import of China in year t	2002-2013	World Development Indicators						
DOC_{ijt}	Total number of documents to Export and import of j in year t	2002-2013	World Development Indicators						
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	EC(0.8,5)	EC(0.8,8)	EC(0.8,10)	EC(0.5,5)	EC(0.5,8)	EC(0.5,10)	EC(0.3,5)	EC(0.3,8)	EC(0.310)

Table 7 Regressing Results of 9 ECs on Common Explanatory Variables Proxies

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	EC(0.8,5)	EC(0.8,8)	EC(0.8,10)	EC(0.5,5)	EC(0.5,8)	EC(0.5,10)	EC(0.3,5)	EC(0.3,8)	EC(0.310)
<i>Ln(Distance)</i>	0.0004 (-0.000304)	0.000603 (-0.000408)	0.000625 (-0.000412)	0.00045 (-0.000342)	0.000645 (-0.000437)	0.000658 (-0.000434)	0.000511 (-0.000388)	0.000694 (-0.00047)	0.000697 (-0.00046)
<i>Ln(Tariff_i)</i> (China's tariff)	0.0791** (-0.0344)	0.0832* (-0.0445)	0.0771* (-0.0448)	0.0890** (-0.0387)	0.0889* (-0.0476)	0.0812* (-0.0472)	0.101** (-0.0439)	0.0957* (-0.0512)	0.0859* (-0.05)
<i>Ln(Tariff_i)</i> (Partner's tariff)	0.0685*** (-0.0265)	0.117*** (-0.0343)	0.126*** (-0.0346)	0.0771*** (-0.0298)	0.125*** (-0.0367)	0.133*** (-0.0364)	0.0876*** (-0.0339)	0.135*** (-0.0395)	0.141*** (-0.0385)
<i>Ln(SPS_i)</i> (Partner's SPS no.)	-0.00388 (-0.00404)	-0.00596 (-0.00523)	-0.00618 (-0.00527)	-0.00436 (-0.00454)	-0.00637 (-0.0056)	-0.00651 (-0.00555)	-0.00496 (-0.00516)	-0.00686 (-0.00602)	-0.00689 (-0.00587)
<i>Ln(Rate)</i>	-0.000535** (-0.000223)	-0.00033 (-0.000291)	-0.000225 (-0.000293)	-0.000602** (-0.00025)	-0.000353 (-0.000311)	-0.000237 (-0.000309)	-0.000683** (-0.000285)	-0.000379 (-0.000335)	-0.00025 (-0.000327)
<i>LnDoc_{it}</i>	1.605*** (-0.203)	2.104*** (-0.263)	2.105*** (-0.265)	1.805*** (-0.229)	2.250*** (-0.282)	2.218*** (-0.279)	2.051*** (-0.26)	2.421*** (-0.303)	2.348*** (-0.296)
<i>LnDoc_{it}</i>	0.0187 (-0.0696)	0.00421 (-0.0901)	-0.000721 (-0.0907)	0.021 (-0.0782)	0.00451 (-0.0964)	-0.00076 (-0.0956)	0.0239 (-0.0889)	0.00485 (-0.104)	-0.000804 (-0.101)
FTA	-1.006**	-1.396***	-1.407***	-1.132**	-1.493***	-1.482***	-1.286**	-1.606***	-1.569***
Adjacency	-0.995 (-1.294)	-1.227 (-1.681)	-1.224 (-1.692)	-1.119 (-1.455)	-1.312 (-1.798)	-1.289 (-1.783)	-1.272 (-1.653)	-1.412 (-1.934)	-1.364 (-1.887)
<i>Language</i>	-12.16** (-5.156)	-12.30* (-6.941)	-11.34 (-7.005)	-13.67** (-5.799)	-13.16* (-7.423)	-11.95 (-7.38)	-15.54** (-6.589)	-14.15* (-7.985)	-12.64 (-7.812)
History	-1.978 (-1.356)	-2.66 (-1.759)	-2.712 (-1.77)	-2.224 (-1.525)	-2.844 (-1.881)	-2.858 (-1.865)	-2.527 (-1.733)	-3.06 (-2.023)	-3.025 (-1.974)
<i>High_i</i>	-2.287 (-2.905)	-2.184 (-3.908)	-1.937 (-3.944)	-2.572 (-3.268)	-2.336 (-4.18)	-2.041 (-4.156)	-2.922 (-3.713)	-2.513 (-4.496)	-2.16 (-4.398)
Constant	121.4*** (-4.263)	80.93*** (-5.643)	64.95*** (-5.689)	115.1*** (-4.795)	74.60*** (-6.035)	59.21*** (-5.994)	107.3*** (-5.448)	67.22*** (-6.492)	52.62*** (-6.344)
Number of Observations	372	372	372	372	372	372	372	372	372
Number of partners	31	31	31	31	31	31	31	31	31
R-squared	0.446	0.431	0.423	0.446	0.431	0.423	0.446	0.431	0.423

Remarks: STATA 12.0, Random effect GLS regression. Standard errors are given in parentheses. ***, ** and* indicates significance under 1, 5 and 10 % level, respectively.

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