Structure and factor intensity feature of agricultural trade in China

Recebimento dos originais: 06/08/2014
Aceitação para publicação: 15/09/2014

Bingqiang Li
Ph.D in Economics
Instituição: Taizhou University.
Endereço: School of Economics & Management, Shifu Avenue 1139,
Taizhou Zhejiang 318000, China.
E-mail: **andylbq@163.com**

Abstract

Structural optimization of agricultural trade is an important path for China's achieving economic transformation and upgrading, so it is necessary to discuss factor intensity during structural adjustment. Structure based on status quo of agricultural trade was analyzed and the feature of factor intensity was detected. Some conclusions were achieved as follow: the degree of product concentration of import was comparatively high and that of export was comparatively low; the processing degree of agricultural import was generally higher than that of agricultural export, no type of China's agricultural product for exporting obviously owned higher proportion than that of the relevant other; proportion of the land-intensive import, proportion of the labor-intensive export and proportion of the resource-intensive import and export would increase, while proportions of the labor-intensive import and the land-intensive export would appear decreasing trend.

Keywords: Agricultural trade. Trade structure. Factor intensity.

1. Introduction

China is now in state of economic transition and upgrading, and development of the agricultural department is an important route to break comparative dilemma. China's agricultural department has achieved great progress since Open & Reform Policy, while foreign trade is essential for exploring comparative advantage so as to achieve sustainable development. As the continuous cultivation of Open & Reform Policy, China's agricultural department would appear different characters. Many scholars made research on China's agricultural transition, mainly about causes of reform, comparative study of agricultural reform, institutions of reform, such as McMillan and Naughton (1992), Huang and Rozelle (1996), Roland (2002), De Brauw, Huang and Rozelle (2004), Rozelle and Swinnen (2009), Lu, Hu and Yan (2012). The agricultural transition would make the corresponding change in its structure, and China's comparative insufficient supply of agricultural products had strengthened the trend of the change. In general,

China's agriculture had experienced four stages of structural evolution (Kong, 2008), and scholars generally considered that comparative advantage (Carter and Zhong, 1991), government effort (Anderson, 1990) were the main causes for the structural change. At the same time, the change of agricultural structure would influence agricultural trade, and scholars generally considered that China exported labor-intensive products and imported land-intensive products (Shuai, Chen, Zhang, 2003; Cheng, 2005; Li, 2012). In fact, the characteristics of the agricultural product might be own not much relationship with China's agricultural structure, for reason of majority of the agricultural product being consumed by domestic market, so it was necessary to detect the feature of factor intensity from aspect of trade structure. This article analyzed status quo of China's agricultural trade, and demonstrated the structure of agricultural trade from multiple aspects, then made comprehensive judgment on feature of factor intensity.

2. Status Quo of China's Agricultural Trade

As to the structure of China's agricultural trade, we made detection from aspect of the degree of product concentration based on analysis of general situation.

2.1. General situation

China's agricultural trade increased rapidly, *e.g.*, export value and import value promoted from 8.084 and 5.876 billion US$ in 1987 to 60.75 and 94.87 billion US$ in 2011 respectively. Figure 1 showed the change trend of China's agricultural trade in 1987-2011, with unit being 0.1 billion US$. We could know that either import value or export value maintained comparative stable development before 2004, which implied that these two were about 10-20 billion US$, and the above two achieved rapid growth after 2004 with rate of importing growth being larger than that of exporting growth. Agricultural trade generally appeared to be in state of surplus before China's entering WTO, the surplus in 1994 being much obvious might be reason of further reform in 1992 activating developing enthusiasm of agricultural trade. The deficit of China's agricultural trade had been numerous after 2001, especially global financial crises in 2008 made China's economy be in state of upgrading and adjustment and foreign agricultural products achieve continuously strong competitiveness, which induced the deficit being larger and larger, *e.g.*, the deficit in 2011 arrived 34.12 billion US$.

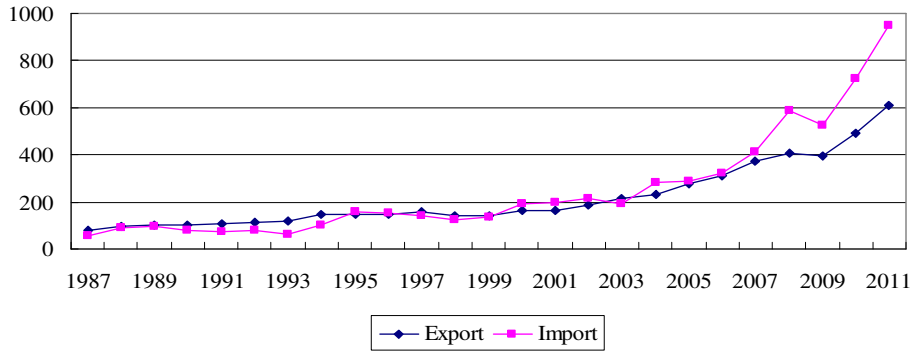

Figure 1: China's agricultural trade in 1987-2011

As to relevant data in 1987-2011, we could get from website of http://faostat.fao.org/, which is the official website of Food and Agriculture Organization of the United Nations. In view of the top 20 product both import or export could be available in the database, and categories of products vibrated much in different time, so we did not outline the classified directory for the detailed classification as for convenience of saving space. We pooled the above top 20 product together and calculated the proportion of that occupying import value or export value respectively, so as to discuss degree of the above representing for China's agricultural trade. Table 1 showed the case in 2001-2011, with unit being percent. The proportion of the top 20 product of exporting in 2001-2011 exceeded 60% in any year, and that was beyond 75% after 2005, demonstrated categories of China's agricultural import being comparatively concentrated, which revealed that the degree of product concentration being comparatively high. But, in view of extensive developing mode for agricultural production in general, characteristics of vast territory and abundant resources, and non-intensive processing mode for agricultural products, China's agricultural export would appear trend of diversity, and categories of exporting products should be comparative more than that of importing, which implied that the proportion of the top 20 product of exporting occupying export value might be comparative lower. In fact, the proportion of the top 20 product of exporting occupying total export value was less than 40% in 2001-2011, and that maintained 32-34% in 2004-2011.

Table 1: The Proportion of the Top 20 Product Occupying Trade Value

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Proportion of import	68.42	64.07	73.26	76.08	74.89	77.61	77.98	81.54	75.97	77.09	78.06
Proportion of export	37.13	39.03	38.07	32.31	34.07	32.30	33.75	32.24	33.75	34.07	32.35

2.2. The degree of product concentration

We made analysis on the degree of product concentration from aspects of top 1 (here, taking CR_1 representing it), top 3 (here, taking CR_3 representing it) and Gini-Hirschman Coefficient, and explored the above three from aspects of import and export.

2.2.1. CR_1 Analysis

The product of CR_1 of importing was comparatively and generally not much change, which was wheat and soybeans in 1987-1996 and 1999-2011 respectively, except for that was cotton lint in 1997 and cake of soybeans in 1998. As to the value of importing, that of wheat appeared obvious decreasing trend in 1987-1994, with that being only 0.961 billion US$ in 1994 and turned back to about 2 billion US$ in 1995 and 1996. China's categories for agricultural importing was in state of comparatively scattered situation after Asian Financial Crisis in 1997, for example, the product of top 1 of importing vibrated much in 1997-1999, and then achieved continuous importing growth on soybeans with its importing value getting 29.726 billion US$ in 2011. The proportion of CR_1 of importing was about or over 20% in 1987-1992 and over 30% after 2007, which implied that the product of agricultural importing was highly concentrated. Table 2 showed CR_1 of importing in 1987-2011, with value's unit being 0.1 billion US$ and proportion's unit being percent.

Table 2: CR_1 of Importing in 1987-2011

	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Product	①	①	①	①	①	①	①	①	①
Value	13.62	17.31	25.81	21.57	14.60	15.04	8.34	9.61	20.26
Proportion	23.19	19.72	27.52	27.93	19.19	19.66	13.79	9.64	12.82
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Product	①	②	③	④	④	④	④	④	④
Value	18.90	13.31	8.62	8.90	22.70	28.10	24.83	54.17	69.79
Proportion	12.58	9.28	6.95	6.54	11.81	14.15	11.49	28.62	24.90
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**		
Product	④	④	④	④	④	④	④		
Value	77.78	74.89	114.73	218.15	187.87	250.93	297.26		
Proportion	27.09	23.41	27.92	37.19	35.75	34.59	31.33		

Note: ①, ②, ③, ④ referred to wheat, cotton lint, cake of soybeans, soybeans respectively.

Compared to CR_1 of importing being comparatively concentrated, the product of top 1 of exporting was rather scattered, there were cotton lint, silk raw, tea, maize, cigarettes, chicken meat, food prep nes, garlic in 1987-2011, which revealed that the advantage of China's agricultural exporting should be cultivated. Among which, maize, food prep nes occupied ten years and seven years respectively, and the other six only occupied the other eight years. Table 3 showed CR_1 of exporting in 1987-2011, with value unit being 0.1 billion US$ and proportion unit being percent. The value of CR_1 of exporting was less than 1.2 billion US$ in 1987-2002, and increased obviously after 2004, but only arrived 2.58 billion US$ in 2011, which was only 8.68 percent of that of soybeans imported in 2011. In fact, the value of CR_1 of exporting had achieved rapid growth, but its proportion occupying exporting total value was less than 10 percent (except for that in 1992), and that had maintained about 4 percent after 2003.

Table 3: CR_1 of Exporting in 1987-2011

	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Product	①	①	②	③	④	④	④	④	⑤
Value	7.56	7.19	5.75	4.13	8.64	11.87	11.54	9.44	8.64
Proportion	9.35	7.47	5.78	4.11	7.94	10.25	9.76	6.39	5.78
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Product	⑤	④	④	⑥	④	⑦	④	④	⑦
Value	8.33	8.59	5.32	5.00	10.52	6.31	11.67	17.67	9.32
Proportion	5.59	5.48	3.73	3.52	6.43	3.81	6.22	8.24	3.99
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**		
Product	④	⑦	⑦	⑦	⑦	⑧	⑦		
Value	10.97	13.04	14.96	16.60	17.29	23.19	25.80		
Proportion	3.98	4.20	4.04	4.10	4.37	4.69	4.25		

Note: ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧referred to cotton lint, silk Raw, tea, maize, cigarettes, chicken meat, food prep nes, garlic respectively.

Comparison of CR_1 according to table 2 and table 3, we could know that the largest product of China's agricultural import was mainly wheat or soybeans, and appeared comparatively strong concentrated trend. The category of CR_1 of exporting being comparatively more complicated and the value of that being relative not large so that the proportion of top 1 of agricultural export to be comparative low, which signified that China's agricultural export did not achieve scale economy to some extend.

2.2.2. CR_3 Analysis

Now turn to detect top 3 of agricultural import and export, so as to reflect the degree of product concentration of agricultural trade more accurate. The reason was that, in general, one single particular product (here, referred to CR_1) of trade might own much uncertainty, which could not effectively reveal the degree of product concentration of trade. In this paper, $ICR3R$, $ECR3R$, $RCR3R$ was regarded as the index representing top 3 occupying the total import value, top 3 occupying total export value, the percent of the value of top 3 of exporting divided by its importing respectively. Figure 2 demonstrated relative indexes of China's agricultural import and export in 1987-2011, with unit being percent. The value of $ECR3R$ was 10-20 percent in 1987-2003, and basically maintained 10 percent in 2003-2011. In table 3, we could learn that the value of the second largest exporting product or the third largest exporting product was not much difference to that of the largest exporting product, which implied that the category of China' agricultural export was scattered. The value of $ICR3R$ appeared steadily increasing trend in 1987-1990, and decreased obviously in 1990-2002, *e.g.*, the value was basically maintained 20 percent in 1998-2002. At the same time, the value of $RCR3R$ achieved rapid growth after 2003, and had maintained about 50 percent in recent years. In fact, China had gradually loosed restriction on agricultural import since entering WTO, therefore, many foreign agricultural products with strong competitiveness would enter rapidly, such as soybeans, rubber nat dry. Meanwhile, accelerating process of China's urbanization and industrialization promoted gradual shrink for the agricultural land promoted larger internal demand for agricultural import, and restricting opening directory of import caused category stabilization of agricultural import, which induced that certain agricultural products appeared steadily increasing trend. The value of $RCR3R$ was about or beyond 40 percent in 1987-2002 (except for that in 1992 and 1993.), and decreased obviously after 2002, *e.g.*, that was about 10 percent in 2011, the reason might be that China's entering WTO promoting international products cutting into and comparatively low competiveness for China's agricultural products made export value be not much change.

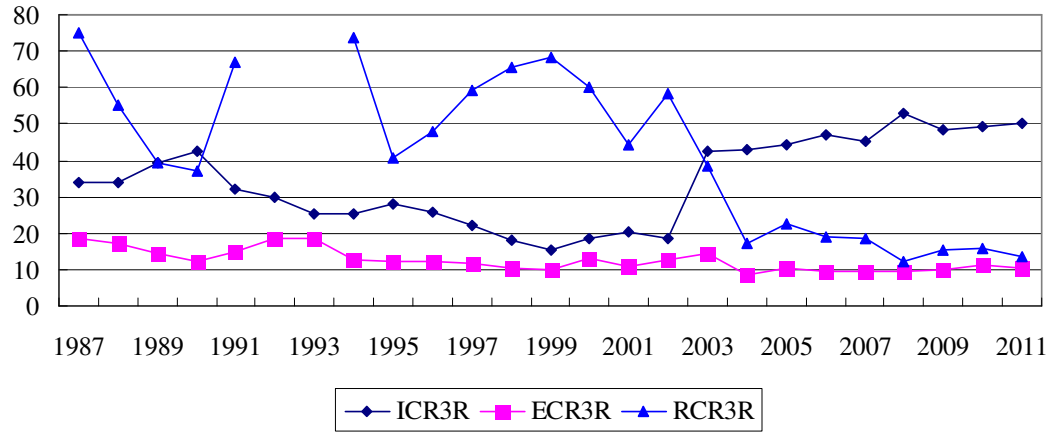

Figure 2: China's CR_3 of exporting and importing in1987-2011

2.2.3. Gini-Hirschman coefficient analysis

There might be some distortion when analyzing Gini-Hirschman Coefficient, especially to that of export, for reason of data of only top 20 of exporting or importing could be available. After comparison of the calculated data, we could learn that the maximum value of $(X_{20t}/X_t)^2/\sum_{i=1}^{20}(X_{it}/X_t)^2$ of importing and exporting was 0.00164 (here, it was in 1999) and 0.01348 (here, it was in 2004) respectively, so there could be ensured that $\sum_{i=1}^{20}(X_{it}/X_t)^2$ might basically reflect the degree of product concentration, no matter of exporting or importing. We took *IGHE* and *EGHE* as the Gini-Hirschman Coefficient of importing and exporting respectively, which were achieved by relevant data calculated by the above formula (see figure 3). The value of *EGHE* was comparatively stable, it was about 15 then reduced to about 10 and then increased to about 15 in 1987-1993, and maintained about 10 in 1994-2003, and then maintained quite stable in 2004-2011 with being comparatively lower than that in 1994-2003, but in general, the degree of product concentration of exporting was comparatively low, which was the same conclusion got from analysis of CR_1 and CR_3 of exporting. The value of *IGHE* vibrated obviously, and generally appeared trend of reduction-increasing-reduction. For example, the value of *IGHE* reduced obviously in 1991-2000, and had maintained relative high level after 2003, revealed that the degree of product concentration of agricultural importing was quite obvious after 2003. In fact, CR_1 and CR_3 of import was beyond 20 percent and 40 percent respectively, which could signify this point to some extend.

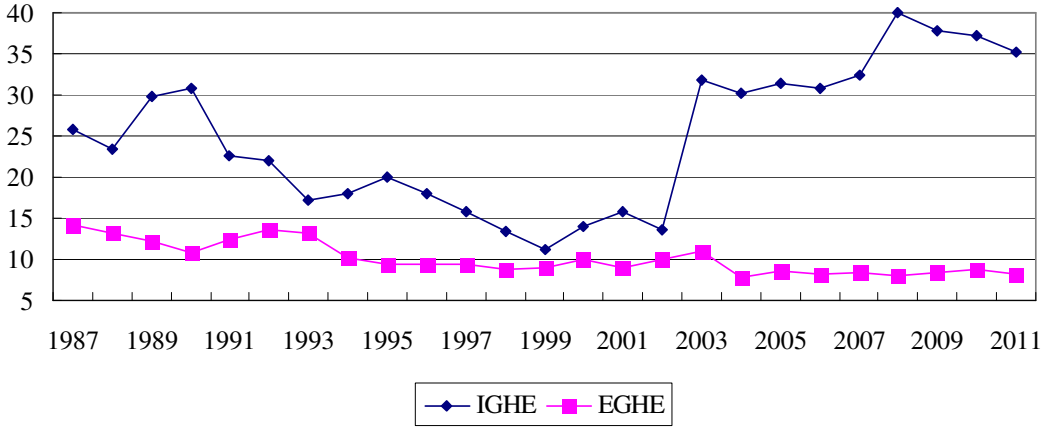

Figure 3: Gini-Hirschman Coefficients of China's agricultural trade in 1987-2011

3. Analysis on Trade Structure of China's Agricultural Product

In view of either import or export, categories of agricultural products had experienced much change in 1987-2011 in China. Therefore, we made analysis from two dimensions of processing classification and product characteristic classification.

3.1. Processing classification

According to China's relevant provisions, the primary processing agricultural product is some item that could be eaten, used or stored after implementation of certain processing program, such as the frozen meat, the feed. The primary agricultural product is derived from the primary product of agriculture, mainly include tobacco, unmanufactured tea, the edible fungus, the melon, the fruit, the vegetable, the flower, the nursery stock, the medicinal material, the grain and oil crop, the animal fur, the aquatic product, the forest product. We regarded other agricultural products not belonging to the primary agricultural product as primary processing agricultural productions for convenience of analysis. The top 20 agricultural products included many categories as mentioned above, and we did not outline the detailed classification as for convenience of saving space. There was one thing should point out, sum of the proportion of the primary agricultural product and the proportion of the primary processing agricultural product was 100 percent for reason of taking the top 20 (here, either import or export) as the whole. Figure 4 demonstrated the proportion of the primary agricultural import and proportion of the primary agricultural export, with unit being percent. Among which, the proportion of the primary

agricultural export occupying total export value and the proportion of the primary agricultural import occupying total import value was replaced by *EPA* and *IPA* respectively.

China's *IPA* was generally in trend of decreasing-increasing-steady in 1987-2011, *e.g.*, it was about 65 percent in 1987, decreased to about 40 percent in 1998, and increased to about 75 percent in 2001 and 2002, then decreased to about 50 percent in 2007 and then tended to be stable. At the beginning of the Reform & Open Policy in China, comparative insufficiency for agricultural production and comparative low level of economic development would require to import large quantity of agricultural products so as to meet need of society and economic development, which implied that *IPA* should be comparatively high, *e.g.*, it was about 65 percent in 1987 and 1988. As time went on, continuously development of domestic agriculture would take strong import-substitution effect on foreign agricultural products, which would make the proportion of primary agricultural import to be steadily decreasing, *e.g.*, it reduced to about 40 percent in 1998. China's entering WTO had significant influence on agricultural trade especially import, this might be the result of comparatively low competitiveness of China's agricultural products especially primary agricultural products, and made *IPA* increase to be about 75 percent in 2001 and 2002, which could be considered that its impacting effect had completely released in 2007 or about. Later, *IPA* maintained comparatively high level in general, *e.g.*, it was beyond 55 percent after 2007, which might be caused by China's demanding more raw material and primary agricultural products for purpose of achieving more efficient economic upgrading and adjustment.

China's *EPA* usually maintained 45-50 percent in 1987-1995, it owned obvious decreasing trend before Asian Financial Crises (here, referred to the year of 1996), and reduced to about 30 percent in 1997, this might be reason of majority of the exporting market being Asian nations, which implemented restricted policies on agricultural products so as to deal with financial crises. However, the effect of Asian Financial Crisis basically smoothed away in 1998, e.g., *EPA* in 1998 was almost equal to that before financial crisis (*e.g.*, 1995). Meanwhile, the time-lag effect of China's entering WTO on primary agricultural export was quite obvious, with *EPA* reducing from 60 percent to about 35 percent during 2004-2007, and had retained about 40 percent in recent years. *EPA* being comparatively low might be the result of significant optimization of China's agricultural export structure and weakening trend of primary agricultural products' competitiveness as for comparative scattering of exporting categories.

Compared with *IPA* and *EPA*, there were not much difference before China entering WTO, but in general, *EPA* was less than *IPA* after 2001, and this could be considered as the result of China's economic transformation to some extend.

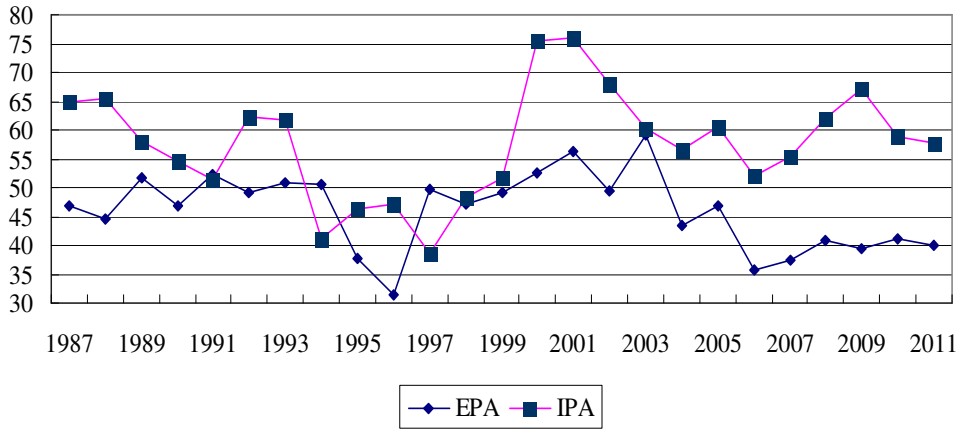

Figure 4: Processing classification in 1987-2011

3.2. Product characteristic classification

Agricultural products could be divided into the grain and oil, the fruit & vegetable and flower, the forest product, the animal product, the aquatic product and other product as per product characteristic. But, in view of either import or export in China, the top 20 did not include the flower and the aquatic product but owned some categories of food, so we divided the above top 20 into the grain and oil, the animal product, the food product and the other product. As to the method of data dealing, it was the same to that of processing classification. Figure 5 showed product characteristic of China's agricultural trade in 1987-2011, with unit being percent. Among which, *ILY*, *ICQ*, *ISW* and *IQT* was the proportion of importing in the grain and oil, the animal product, the food product and the other product respectively. *ELY*, *ECQ*, *ESW* and *EQT* was the proportion of exporting in the grain and oil, the animal product, the food product and the other product, respectively.

Analysis from view of importing based on multiple dimensions. *ILY* maintained over 40 percent, and was about 70 percent in 2008 and 2009. *ICQ* vibrated much in 1987-2002, and had retained about 10 percent after 2003. *ISW* was generally 5-10 percent in 1987-1995, and increased obviously in 1996-1998, then maintained to be about 10 percent in 1999-2005, but appeared increasing trend in recent years, which showed that the proportion of food import increased obviously. *IQT* was less than 30 percent in any given year, which implied the above three types could reflect reality of China's agricultural import. Therefore, we could learn that the major type of China's agricultural import was the grain and oil.

Then turned to make analysis on exporting. The proportion of each type might be comparatively small (except for *EQT*) for reason of the top 20 of exporting occupying export

total value being about 30 percent. In fact, proportion of each of the above three types did not exceed 31 percent in any given year, *ELY* and *ECQ* owned decreasing trend obviously (*e.g.*, relevant proportion was less than 10 percent for the above two types), but *ESW* increased comparatively rapid (*e.g.*, it had maintained over 20 percent in recent years). Seen from *EQT* with characteristic of reflecting concentration quality of exporting directly, it was about or beyond 50 percent in 1987-2011, and had exceeded 65 percent since 2006, which could show that dispersion of China's agricultural products for exporting being obvious.

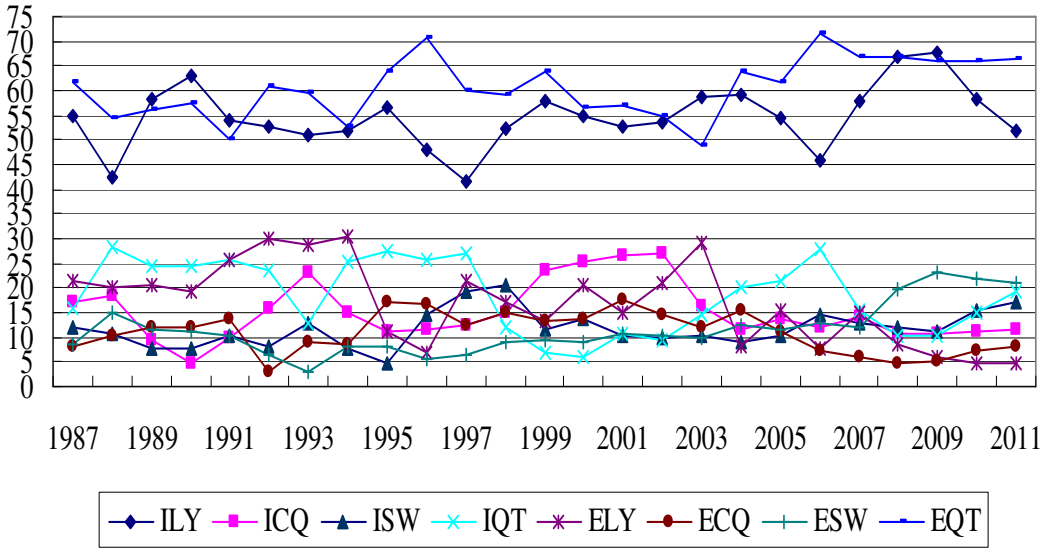

Figure 5: Product characteristic classification in 1987-2011

4. Analysis on Factor Intensity of China's Agricultural Trade based on Trade Structure

At present, there was no typical criterion for judging factor feature on certain agricultural product. We made the agricultural product into categories of the land-intensive, the labor-intensive and the resource-intensive for convenience of analysis, and regarded the top 20 (including export and export) as the whole. The land-intensive agricultural product referred to those requiring much land during process of production, mainly included the grain, the Youzi, the cotton, the unmanufactured tobacco. The labor-intensive agricultural product referred to those living animals and products needing more labor, mainly included the fruit, the vegetables, the rubber, the sugar, the animal feed, and the flour industry. The resource-intensive agricultural product referred to those needing plenty of resource during process of production, mainly included the grain product, the fruit and vegetable product, the meat products, the aquatic

product, the beverage, the oil, the manufactured tobacco, the alcohol, the food. Here, we used *Ilan* , *Ilab* , *Ires* to represent the percent of the land-intensive product, the labor-intensive product, the resource-intensive product occupying importing total value respectively. *Elan* , *Elab* , *Eres* was represented the percent of the land-intensive product, the labor-intensive product, and the resource-intensive product occupying exporting total value respectively. We made detailed description on factor intensity from perspectives of general feature, type comparison and trend judgment.

General feature analysis. Given the following judging criterion, we regarded the largest proportion of that type of agricultural product as the general characteristic of the whole trade as for the three types mentioned. For example, the general feature of agricultural import would be resource-intensive if *Ires* was the largest proportion compared to the other two. From the data calculated, we could learn that agricultural export was resource-intensive, agricultural import was generally land-intensive but was resource-intensive in particular years (here, the certain years were 1991, 1994-1998, 2006-2007). Meanwhile, various factor intensities might take corresponding change, so there was necessary to make type comparison analysis.

Type comparison analysis. Figure 6 indicated the change of various factor intensities of importing and exporting, with unit being percent. Seen from import, *Ilab* vibrated much in 1987-2002 but was within 18 percent after 2003, which demonstrated that proportion of labor-extensive agricultural import was relative small in overall; *Ilan* and *Ires* presented alternatively change, *e.g.*, *Ilan* was larger than *Ires* in 1987-1993 and got the opposite in 1994-1998, while it was adverse again after 1998 (except for 2006 and 2007) . Seen from export, *Elan* experienced state of up and down, *e.g.*, fell to about 3 percent in 1995 and 1996, then slipped from about 30 percent in 2003 to about 8 percent in 2011; *Elab* was comparative stable in 1987-2011, mainly maintained 38-43 percent; *Eres* appeared increasing trend for reasons of *Elab* being comparative stable and *Elan* being decreasing obviously in recent years, *e.g.*, switched from about 38 percent in 2003 to about 53 percent in 2011.

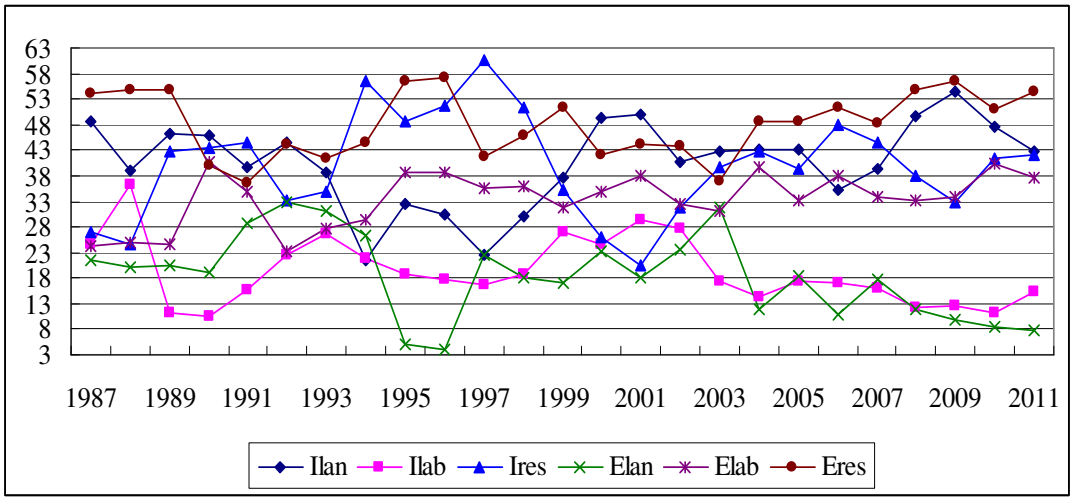

Figure 6: Type comparison of factor intensity for China's agricultural trade in 1987-2011

Trend judgment analysis. Figure 6 could reflect the change of various factor intensities to some extend but not very clear, so there was necessary to take corresponding measurement to detect the trend of factor intensities. Taking land-intensive agricultural import as an example, we set a simple econometric model, named $InIlan = a + bt$. Among which, t represented time, and took year 1987 as the first year, the research period was 1987-2011. Here, b being larger than zero implied that *Ilan* would take trend of increasing, b being less than zero implied that *Ilan* would take trend of decreasing, b being zero implied that *Ilan* had no relationship with the time. Taking E-view 6.0 as econometric tool, we could achieve b value of *Ilan*, *Ilab*, *Ires*, *Elan*, *Elab* and *Eres* was 0.0073, -0.0154, 0.0030, -0.3030, 0.127, 0.0035 respectively. From the econometric result, we could know that proportion of import in land-intensive and resource-intensive, proportion of export in labor-intensive and resource-intensive appeared trend of increasing, while proportion of import in labor-intensive and export in land-intensive appeared trend of weakening. In fact, China's Red Line's gradual lowering and steady progress of urbanization and industrialization would have continuously strong impact on land-intensive agricultural trade, which brought import increase and export decrease rapidly, and the econometric result supported this point. At present, China's agriculture, the rural area and the farmer problem were difficult to be effectively resolved, and the key point was that there was too much extra rural surplus labor in rural areas especially in less developing areas, which would appear comparative strong import-substitution effect on labor-intensive products for a long time, *e.g.*, the econometric result showed that coefficient of import or export was significant larger than that of the other two. Resource-intensive agricultural trade was intimate relationship with the region's internal resource, but the exclusive feature of the resource would make it difficult to vibrate much in short period, so influence of time change would be comparatively small, *e.g.*,

the econometric result showed that coefficient of import or export was less than that of the other two. Meanwhile, continuous deepening of international division would also strengthen the advantage of resource-intensive products, which would induce the coefficient to be positive for importing and exporting.

5. Conclusions

Taking industrial data of China's agricultural trade in 1987-2011, we investigated agricultural trade structure from multiple aspects based on analyzing status quo of agricultural trade, and elucidated factor-intensive features from perspective of trade structure. China's status quo of agricultural trade was analyzed from aspects of generation situation and the degree of product concentration, we achieved that trade deficit had been gradual larger in recent years, analysis of the degree of product concentration based on angles of CR_1, CR_3 and Gini-Hirschman Coefficient indicated that importing product concentration degree was comparatively high and exporting product concentration degree was comparatively low. Agricultural trade structure was analyzed from aspects of processing classification and product characteristic classification, among which the primary agricultural product and the primary processing agricultural product were divided by method of processing classification, the grain and oil, the animal product, the food product and the other product were divided by method of product characteristic classification. The results showed that proportion of the primary agricultural product for exporting was larger than that of the primary processing agricultural product for exporting, it was the opposite to that of importing regarding of these two relevant proportions, and processing degree of agricultural import was generally higher than that of agricultural export; proportion of the grain and oil for importing was significant higher than other proportions for importing, proportion of the animal product for importing was similar to that of the food product for importing in recent years, while no type of China's agricultural product for exporting owned obviously high proportion. The land-intensive, the labor-intensive and the resource-intensive were divided, factor intensity for China's agricultural trade product was analyzed from the aspects of general feature, type comparison and trend judgment. Some conclusions could achieve that agricultural import was mainly land-intensive (except for resource-intensive type in some years) and agricultural export was resource-intensive; the proportion of import in land-intensive or in resource-intensive were significant larger than that of import in labor-intensive, and there was the following relationship for agricultural exporting (here, named proportion): resource-intensive > labor-intensive > land-intensive; proportion of

import in land-intensive and resource-intensive, proportion of export in labor-intensive and resource-intensive export would increase, while proportion of import in labor-intensive and export in land-intensive would decrease.

6. References

ANDERSON, K. Changing Comparative Advantage in China: Effects on Food, Feed and Fabre Markets. *OECD*, Paris, 1990.

CARTER, C.A.; ZHONG, F. Will market prices enhance Chinese agriculture? A test of regional comparative advantage. *Western Journal of Agricultural Economics*. Vol. 16, n. 2, p. 417-26, 1991.

CHENG, G. China's agricultural exports: competitive advantage and key issues. *Issues in Agricultural Economy*. Vol. 5, p. 18-22, 2005.

De BRAUW, A.; HUANG, J.; ROZELLE, S. The sequencing of reforms in China's agricultural Transition. *Economics of Transition*. Vol. 12, n. 3, p. 427-466, 2004

HUANG, J.; ROZELLE, S. Technological change: rediscovering the engine of productivity growth in China's agricultural economy. *Journal of Development Economics*. Vol. 49, p. 337-369, 1996.

LI X.L. Technology, factor endowments, and China's agricultural foreign trade: a neoclassical approach. *China Agricultural Economic Review*. Vol. 4, n. 1, p. 105-123, 2012.

LU, J.; HU, A.G.; YAN, Y.L. Nonlinear investigations of China's agricultural transformation based on the structural break regime switching model. *China Agricultural Economic Review*. Vol. 4, n. 1, p. 52-68, 2012.

MCMILLAN, J.; NAUGHTON, B. How to reform a planned economy: lessons from China. *Oxford Review of Economic Policy*. Vol. 8, p. 130-143, 1992.

ROLAND, G. The political economy of transition. *Journal of Economic Perspectives*. Vol. 16, n. 1, p. 29-50, 2002.

ROZELLE, S.; SWINNEN, J.F.M. Why did the communist party reform in China, but not in the Soviet Union? The political economy of agricultural transition. *China Economic Review*. Vol. 20, n. 2, p. 275-28, 2009.

SHUAI, C.; CHENG, G.; ZHANG, J. The estimation of China's agricultural competitiveness. *Management World*. n. 1, p. 97-103 (in Chinese), 2003.

7. Acknowledgements

This study was supported by China's Ministry of Education (Project 12YJC790088), China's National-sponsored Funding Program for Social Sciences (Project 13AJY011), Humanities and Social Sciences Research Project of Zhejiang Education Department (Project 2013QN067), Zhejiang Technology Department (Project 2013C25080), China's Ministry of Agriculture (Project D201436), Taizhou Social Fund (Project 13GHZ03).