

On The Research of Statistical Scope of International Agricultural Trade¹

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Abstract

To specify the statistical method used is the important foundation for analysis of international agricultural trade. Presently, there are two statistical systems widely used in international agricultural trade. One is United Nations Standard International Trade Classification (SITC), the other is Harmonized Commodity Description and Coding System (HS). Different categorization of agricultural products by the two systems gives rise to the problem of specification of product scope.

International organizations such as WTO, UNCTAD and FAO specify the statistical scope according to their needs. Statistical methods of international agricultural trade currently used in China are sort of complex among which 6 methods are commonly used. These include URAA agricultural definition, first 24 chapters of HS, FAO agricultural definition based on SITC, UNCTAD agricultural definition, and ITS agricultural definition of WTO. Complicated statistical methods result in disagreement in trade data and specification of agricultural product scopes, a situation that will greatly affect the efficiency and results of trade statistics and analysis on trade policies and theories. In addition, international trade data in different period are gathered according to different statistical standards and the earliest data available under HS system are those in 1992. Acquisition of long time series data (before 1992) of international agricultural trade faces with the problem of matching product definitions under different statistical systems (HS and SITC), overlooking which will definitely result in less convincing analytical results, or even conflicting and wrong conclusions. Currently, studies on the statistical scopes of agricultural product are still in the discussion stage both at home and abroad.

On comparing and analyzing product scopes and features of the above mentioned six statistical methods, the paper discusses the advantages and disadvantages of them and matches statistical scopes under HS and SITC. Researches on statistical scopes of international agricultural trade show that the problem arisen from different agricultural statistical methods could be solved through specific discussions on it. Starting from the different statistical methods currently used, the author

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holds that each method has its applications while has the problem of inconsistent scope definition. And a complete, exact and comparable definition of agricultural product scope will provide a solution to the above problem. By matching product codes of the same product under HS and SITC to get counterpart relationship, the paper harmonizes trade data under different categorizing systems and provides basis for establishing standard statistics system and basic data platform.

1. Compare and Analysis on Statistical Methods Widely Used of International Agricultural Trade

HS and SITC are standard statistical systems aiming at advancing international trade statistics standardization by Custom Cooperation Council and U.N. Statistical Commission. International organizations such as WTO, UNCTAD and FAO specify the statistical scope according to their needs. This paper contrasts and analyses the six widely used agricultural products statistical methods presently. It also studies the product scope, the characteristic, the advantages and disadvantages of them.

1.1 Agricultural Products Statistical Method of URAA

URAA defines the statistical scope of agricultural trade based on HS. Both the actualization of Agriculture Agreement and the New Round WTO Negotiation adopt this product scope.

Agricultural products in this method consist of first 24 chapters (aquatic products exclusive) of HS with products coding at 2905.43, 2905.44, 33.01, 35.01-35.05, 3809.10, 3824.60, 41.01-41.03, 43.01, 50.01-50.03, 51.01-51.03, 52.01-52.03, 53.01 and 53.02. Since 1995, the agricultural products statistics that China Agriculture Annual release also use this method.

The agricultural products scope of URAA excludes aquatic products due to the diversity, complexity and consideration for relative environment protection factors instead of ignoring the importance of it. It is necessary to eliminate aquatic products under 6 even 8 digit tax items from the first 24 chapters of HS when the custom statistics data are used. This requires the researchers to be quite familiar with trade statistics. China includes aquatic products into the great agriculture category because aquatic products occupy a great share in world agricultural trade. For researchers, the scope and data access in this method are with certain limitation and complexity.

1.2 First 24 Chapters of HS

Agricultural products under this method include live animals and animal products (HS Chapter 01-05), foliage products (Chapter 06-14), propagation oil, fat and wax (Chapter 15), food, drinks and tobaccos (Chapter 16-24).

The scope it defines is clear and easy to gather. Trade data can be collected through adding data from each chapter of HS. However, the product scope is not sufficient in contrast with statistical method of URAA Definition, which means it lacks certain kinds of agricultural products.

1.3 URAA Agricultural Definition and Aquatic products in First 24 Chapters of HS

Presently, researchers in China use this method widely and call it agricultural products and aquatic products of URAA Definition. It has the virtue of the first method and avoids the limitations of the first two methods to some extent.

Agricultural products have 1057 heads of eight digit tax items totally according to China tax regulations of 1996 edition, 1121 and 1223 heads of eight digit tax items totally according to 2000 and 2006 editions. This method is beneficial because China adopts HS system to obtain trade statistical data. Besides, adding aquatic products to the product scope makes it more complete.

1.4 URAA Agricultural Definition and All the Aquatic products

It has the advantage of URAA Agricultural Definition. Compared with the third method, the scope of aquatic products is complete. It contains iodine (280120), natural and cultured pearl (7101) and 391310 all together 5 six digit tax items. A complete agricultural products statistical scope accordant with production method can be obtained from this method. The problem is that the agricultural products distribute in multi-chapters of HS, which makes the product scope complex.

1.5 FAO Agricultural Definition Based on SITC

SITC classify products by sector, category and group. The main foundations are the economic functions and degree of machining, in accordance with the raw materials, semi-manufactured product and the product classification, which reflect the professional sector sources of commodities. This method is close to the production-method and has clear corresponding relationship with agricultural industries. Nearly 10 years ago, countries adopt HS coding system as trade-method in order to merge with the world. Data from HS can be given after 1992, only by matching with SITC can we get the long-time series, through which can access data to meet research needs.

FAO has used this method for a long time. Although the scope of agricultural products that FAO dominates include aquatic products and forest products, the statistics exclude both of them. FAO statistics specify products in food and live animals (Chapter 00-09), beverages and tobacco (Chapter 11 and 12), non-food materials (21, 22, 23 EX¹, 26EX and Chapter 29, except fuels), mineral fuels and lubricants and related materials (Chapter 41-43).

Adoption of this method is inadequate in two respects. First, SITC offers sub-chapter data only in China Customs Statistics Annual since HS system was used in 1992, which is difficult to be used for detailed SITC accurate statistics. Second, the statistical data provided by Statistical Yearbook of China Customs can not remove the non-agricultural products in Chapter 23 and 26 which belong to the 2nd class, resulting in excessive agricultural trade statistical data. Worth mentioning is that Chinese in FAO agricultural trade statistics refers not only the Chinese mainland, there is a need to be careful.

1.6 UNCTAD Agricultural Definition and ITS Agricultural Definition of WTO

¹ EX means that the statistical products are incomplete, with exclusiveness

UNCTAD trade statistics and the WTO International Trade Statistics (ITS) define the scope of agricultural products basically the same with SITC, only with slight differences in the definition of food. Agricultural products include two parts, food and agricultural raw materials. SITC category 2 Chapter 22 (oilseeds, fruit and oil) are included in the food area and agricultural raw materials area by ITS and UNCTAD trade statistics separately.

Agricultural products include SITC category 0 (food and live animals), category 1 (beverages and tobacco), Category 2 (non-food materials, except for fuel) and category 4 (animal and vegetable oils, fat and December), except for commodities in Chapter 27(natural fertilizers and minerals, except coal, oil and gemstones) and Chapter 28 (metalliferous ores and metal scrap) which belong to category 2. The scope of agricultural products defined in this statistical standard appears to be too general.

From the analysis above, this paper summed up product scopes, features, advantages and disadvantages of the above mentioned six statistical methods (Table 1).

Table 1 Scope and Characteristics of Agricultural Products Under Different Statistical Standards

Statistical method	Product scope	Advantage	Disadvantage
URAA Agricultural Definition	First 24 chapters of HS (aquatic products excluded) with agricultural products after 24 chapters of HS	Convenient for WTO Negotiation, statistics and economic research	Aquatic products distribute wide, elimination workload is heavy and its importance is easy to be ignored
First 24 chapters of HS	All the products in chapter 01-24 of HS	The method is simplified, the scope is in order and easy to statistic	Lacking of some agricultural products, product scope incomplete and conclusions inaccurate
URAA Agricultural Definition with Aquatic products in First 24 Chapters of HS	First 24 chapters of HS with agricultural products after 24 chapters of HS	Be close to trade method, aquatic products in the first 24 chapters are added to it	The scope of aquatic products is incomplete
URAA Agricultural Definition with All the Aquatic products	First 24 chapters of HS ,agricultural products after 24 chapters of HS with aquatic products like iodine and pearl	Including all the aquatic products, the scope of agricultural products is relatively complete	The scope of products is complex, distribute in several chapters, not conducive to overall statistics
SITC Agricultural Definition	Chapter 00-09, 11, 12, 21, 22, 23EX, 26EX ,29 except fuels and Chapter 41-43 of SITC	Corresponding with agricultural industry, facilitate long sequence analysis	The aggregate data can only be used since 1992, difficult to be analyzed accurately. Unable to remove non-agricultural products leading to trade data transfer
UNCTAD and ITS Agricultural Definition	category 0-2 and 4 of SITC, except for commodities in chapter 27 and 28	Corresponding with agricultural industry, facilitate statistics	The scope of agricultural products defined is general to some extent

It shows that the existence of each statistical method has its own applicable conditions and rationality, while there are some flaws. Six top-method statistics are more commonly used, in addition, trade statistics data given by some researchers are not in line with common trade data sources such as China Customs Statistics Annual, Chinese Foreign Trade Statistics Annual, Chinese Agriculture Annual and FAO Trade Annual. It is difficult to judge the statistical standards that the data based on. This paper concludes such a situation might be due to (a) Data are from some of the databases abroad, such data resources are in discrepancy with conventional statistics.(b) Researchers define the agricultural statistics scope for their research purposes or to facilitate access to the data. (c) For simplifying the study, some non-agricultural products were added to the database (such as FAO statistics) by researchers, leading to inadequate data and the results of distortion. (d) Researchers can find the SITC category and chapter Statistics abstract only in China Customs Statistics Annual since HS coding system was used, which is too simple to use part of the statistical summary data from SITC.

So far China has never had a comprehensive and authoritative statistical method for agricultural trade system, we can only define in concrete according to our purposes and needs, which is not conducive to trade and economic research. Study on China's foreign trade in agricultural products of coverage in-depth can obtain a complete and applicable statistical system to resolve problems like many agricultural statistical standards exist and data sources are in chaotic. Based on this, relevant departments should establish standards for agricultural trade statistical method system and the corresponding database, improving this fundamental work of agricultural trade.

2. The Problem of Different Agricultural Trade Statistical methods

Different statistical methods make different scopes of agricultural products, which lead to a lack of consistency between agricultural trade statistics and related research conclusions. To illustrate the problem, this paper analyses and summarizes the results of agricultural trade balance estimated of China from 1996-2005 in six statistical methods (Table 2).

Table 2 Estimated Results of China's Agricultural Trade Balance² (100 million US dollars)

Year	Method 1	Method 2	Method 3	Method 4	Method 5	Method 6
1996	22.88	51.88	33.55	34.23	7.89	-31.76
1997	36.55	68.86	49.37	50.24	25.12	-28.77
1998	44.41	63.84	55.14	55.97	34.42	-12.36
1999	42.69	58.10	53.31	53.73	35.80	-10.87
2000	33.44	54.17	44.03	44.42	17.13	-22.77

² — Indicates that the data are incomplete. Method 1 is URAA Agricultural Definition, data from China Agriculture Annual (1997 ~ 2005). Method 2 is the first 24 chapters of HS, data from China Customs Statistics Annual, statistics by the author of eight digit tax items. Method 3 is URAA Agricultural Definition with aquatic products in the former 24 chapters of HS, data sources and statistical method are with method 2; Method 4 is URAA Agricultural Definition with all of the aquatic products, data from China Customs Statistics Yearbook. Method 5 is SITC Agricultural Definition, data from China Customs Statistical Annual. Method 6 is with aquatic products removed, data from FAO Trade Yearbook 56 vol.

2001	34.01	56.86	41.96	42.29	14.71	-34.01
2002	16.42	70.70	56.58	56.97	27.00	-16.42
2003	-5.00	51.32	24.31	24.97	-13.31	—
2004	-85.00	6.99	-47.56	-46.43	-92.61	—
2005	—	42.73	-12.72	-11.38	—	—

Presently, there are contradictions to some extent in the conclusion of the research for China agricultural trade balance because of the difference from choice of statistical methods and data sources. Data from Table 2 are from six agricultural statistical methods and three sources. Obviously, there are considerable differences among the agricultural trade balance in six statistical methods. The balance of China agricultural trade is surplus or deficit needs further studies under long-time series. A statistical system with integrity, applicability and authority is needed to be given to resolve issues of these kinds. The key point is the alignment of product scope under different systems. Therefore, we should accelerate the work to clear the agricultural trade statistical methods, defining a complete, accurate and comparable scope of agricultural products to find the corresponding relationship between SITC and HS.

3. Matching Project between HS and SITC for Agricultural Products Scope

We need to use the identical product code of corresponding agricultural products under HS and SITC in order to obtain the corresponding relationship between HS and SITC, define a complete, accurate and comparable scope of agricultural products and achieve the link of statistics between agricultural trade and agricultural industry. Presently, some researchers select trade data completely under SITC or HS statistical method for the sake of neat data and easily access, or evade the definition for the scope of agricultural products and statistical method alignment. Some researchers link some agricultural products under HS and SITC in order to obtain accurate long-time series data, but the correlation is not close and data are not reliable.

To establish standard statistical system bases on the solution with the link between HS and SITC. Choose agricultural products which URAA defines and all of the aquatic products as the scope of aligning agricultural products to correspond the codes of the same type of agricultural products under HS and SITC. This paper holds that the relationship is neither close enough for alignment of agricultural products between HS and SITC, nor suitable for practical applications under 2digit tax items. We should further use four digit tax items of HS as the benchmark, correspond the agricultural products under SITC standard classification to 3 digit tax items and convergence the codes of agricultural products under HS and SITC.

**Table 3 The Corresponding Relationship Between HS 4 Digit Tax Items and
SITC 3 Digit Tax Items³**

HS	SITC	HS	SITC	HS	SITC
0101—0106	001	0904—0908, 0910	075	1801—1805	072
0201, 0202	011	1001	041	1806	073
0203—0208, 0307	012	1002, 1004, 1007, 1008	045	2009	059
0209, 1501—1506	411	1003	043	2101	074
0210	016	1004, 1007, 1901, 1902, 1904, 1905	048	2201—2202	111
0301—0304	034	1005	044	2203—2206, 2208	112
0305	035	1006	042	2401	121
0306, 0307	036	1101, 1103	046	2402—2403	122
0401—0404, 2105	022	1102, 1103	047	2801*	522
0405	023	1108—1109, 3501—3505	592	3301	551
0406	024	1201, 1202, 1205, 1206, 1207	222	3809, 3824	598
0407—0408	025	1203, 1204, 1207, 1208	223	3913*	575
0409, 1701—1703	061	1213, 1214, 2301—2309	081	4101—4103	211
0410, 1602, 1901, 1902, 2005, 2007, 2102—2104, 2106, 2209	098	1507—1510, 1512, 1514, 1515	421	4301	212
0501—0511	291	1511, 1513, 1515	422	5001—5003	261
0601—0604, 1209, 1211, 1212, 1301—1302, 1401—1404	292	1516, 1518, 1521, 1522	431	5101—5103	268
0701—0711, 0713, 0714, 1210, 1212	054	1517	091	1404, 5201—5203	263
0712, 1105, 1106, 1903, 2001—2004, 2005	056	1520, 2207, 290543, 290544	512	5301—5302	265
0801—0810, 0813	057	1601-1603	017	7101*	667
0811, 0812, 0814, 2007, 2008	058	1604—1605	037		
0901, 2101	071	1704, 2006	062		

Table 3 shows the correspondence of agricultural products classification coding system between SITC 3 digit tax items and HS 4 digit tax items. A total of 61 heads of SITC 3 digit tax items correlate with 229 heads of HS 4 digit tax items, among which 229 heads of HS 4 digit tax items

³*On behalf of the difference from statistical method 4 and 3, that is the aquatic products which are not included in the first 24 Chapters of HS.

basically cover all of the agricultural trade currently. There are a number of HS 4 digit tax items counterpart SITC 3 digit tax items, there also exists the condition that one HS 4 digit tax item counterparts two SITC3 digit tax items .

4. Conclusions and Suggestions

(a) Agricultural products statistical methods are the foundation of agricultural trade .Its complexity affects trade statistics, relevant research results and efficiency greatly, yet through thematic and detailed statistical method research to be addressed. From the current widespread use of statistical standards, this paper started to explore this issue, offer the foundation of standards for agricultural statistics system.

(b) This paper compares and analyses product coverage, characteristics, advantages and disadvantages of six commonly used agricultural statistical methods. Each type of statistical method has its applicability, but also the existence of problems such as differences in defining the scope. A complete, exact and comparable definition of agricultural product scope will provide a solution to the problems mentioned above.

(c) To obtain the corresponding relationship between HS and SITC, this paper convergence the corresponding product codes of the same type which amount to these two systems. This paper also harmonizes trade data under different categorizing systems and provides basis for establishing standard statistics system and basic data platform.

(d) Chinese relevant departments should attach importance to issues of agricultural trade statistical methods, design the statistical system which is authoritative, of integrity and applicable to Chinese agriculture practice and agricultural characteristics. We should establish a unified agricultural statistics database by using existing data to meet the needs of our relevant departments and science study.

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