

Assessing the Trade Policy of the U.S. Agro-Imports

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Abstract—This study compares the U.S. import trade patterns in primary agricultural products and agricultural manufactures from 1978 to 2017. We find that the U.S. imports of primary agro-products are subject to import restriction, while that of the agro-manufactures are characterized by import facilitation. In the past 40 years, the U.S. trades in agro-products have been much far away from free trade.

Keywords— the United States; agricultural products; imports; trade pattern; trade protection

I. INTRODUCTION

It is generally believed that the United States regulates imports through both tariff and non-tariff means to protect domestic industries at a comparative disadvantage [1]. Existing literatures have studied the import restrictions of The U.S. agricultural products from multiple perspectives [2]-[4]. Meanwhile, many literatures point out that agricultural subsidies are an important means of promoting the export of The U.S. agricultural products [5][6]. Both import restriction and export promotion are actually manifestations of trade protectionism [7][8]. Scott (2017) emphasizes that under the protection of agricultural products, the multilateral trade system of WTO is seriously inconsistent with the demand of low-income countries to achieve economic growth through the export of agricultural products based on their comparative advantages [9].

How much are the U.S. agricultural imports protected? How far are the trade patterns deviate from free trade? Are primary agricultural products and manufactured agricultural products of different protectionist characteristics? How to evaluate the us agricultural import policy? These questions can only be answered through empirical research.

II. METHODOLOGIES AND DATA

Hong (2009) pointed out that under the condition of free trade, a country's comparative advantage in a certain commodity should match its net export capacity when its trade pattern is balanced, which can reflect the deviation tendency of its trade policy by measuring the difference between the two [10]. This study USES its methods to analyze the patterns of agricultural import trade in the United States.

A. International Competitiveness Index

A country's international competitiveness index for a product is

$$IC_{ik} = (X_{ik} - M_{ik}) / (X_{ik} + M_{ik}) \quad (1)$$

Where X represents export and X_{ik} is the export of k products from country I . The range of IC_{ik} is $[-1, 1]$, and the average value is 0. $IC_{ik} > 0$ means that country I has a surplus in the trade of product k , while $IC_{ik} < 0$ means that it is in a deficit position. $IC_{ik} = 0$ when the imports and exports are equal. It can be seen that the international competitiveness index actually reflects the net export capacity of a country in a certain product.

B. Revealed Comparative Advantage

Balassa (1965) was the first to use the indicator of comparative advantage reflected in trade [11]:

$$RCA_{ik} = (X_{ik} / X_i) / (X_{wk} / X_w) \quad (2)$$

X_{wk} represents the total exports of k products from all countries in the world, while X_w represents the total exports of all products in the world. $RCA_{ik} > 1$ indicates that China has a comparative advantage in the trade of specialized production of k products [5][6].

C. Revealed Symmetric Comparative Advantage

The range of RCA is zero to infinity, but its average value is not certain and its distribution is not symmetric. Only after logarithmic transformation can it be compared with the IC index:

$$RSCA_{ik} = (RCA_{ik} - 1) / (RCA_{ik} + 1) \quad (3)$$

$RSCA_{ik}$ is a "symmetric revealed comparative advantage index" for the export of k products in country I . Its range is the same as IC_{ik} , which is $[-1, 1]$, and the average value is also 0. When $RSCA_{ik} > 0$, there is $RSCA_{ik} > 1$, indicating that country I has a comparative advantage in the export of k products. When $RSCA_{ik} < 0$, $RCA_{ik} < 1$, indicating that country I is at a comparative disadvantage in the export of k products. When $RSCA_{ik} = 0$, the comparative advantage of k exports of country I is the same as that of other countries in the world, and there is neither comparative advantage nor comparative disadvantage in k exports of country I [12].

D. Index of Policy Intervention

In Heckscher-Ohlin theory, comparative advantage comes from factor endowment. A country should specialize in and export the products which are intensive in the factors that it is abundant and has comparative advantage in. According to the free trade theories, a country should export more and import less products with high comparative advantage. In the state of equilibrium, IC_{ik} and $RSCA_{ik}$ should be strictly consistent, that is, $IC_{ik} - RSCA_{ik} = 0$. Then

$$IC_{ik} = RSCA_{ik} \quad (4)$$

Is the equilibrium condition of free trade [13] [14]. The difference between IC_{ik} and $RSCA_{ik}$

$$h_{ik} = IC_{ik} - RSCA_{ik} \quad (5)$$

Is the policy intervention index of country I's import trade in product k. When trade pattern equilibrium is satisfied, $h_{ik} = 0$. If $h_{ik} > 0$, the net export capacity exceeds the level determined by its demonstrated comparative advantage, indicating that country I has adopted trade policies that limit imports and improve the international competitiveness of its products. If $h_{ik} < 0$, it means that the import trade policies adopted by country I are not restrictive but have the characteristics of encouraging imports.

E. Weighted Average Index of Policy Interventions

Since there are n specific product categories in both primary and manufactured agricultural products of the United States, it is necessary to obtain the policy intervention index of import trade of the two categories of commodities through weighted average.

$$H_{ij} = \sum_{k=1}^n \omega_{ik} (IC_{ik} - RSCA_{ik}) \quad (6)$$

H_{ij} is the index of trade policy interventions for category j products (primary agricultural or manufactured agricultural products). Among them

$$\omega_{ik} = (X_{ik} + M_{ik}) / \sum_{i=1}^n (X_{ik} + M_{ik}) \quad (7)$$

For each specific product k in the United States primary agricultural import and export trade proportion. The reason why import is protected in the weight is that the weighted object h_{ik} involves both import and export. For the same reason, the weight weight of IC_j for category j products in this study is the same. The weighted average international competitiveness index of category j products is:

$$IC_{ij} = \sum_{k=1}^n (\omega_{ik} \cdot IC_{ik}) \quad (8)$$

In this study, $RSCA_{ik}$ only involves the import of the KTH product, so the weighted average $RSCA_{ij}$ of the JTH product is:

$$RSCA_{ij} = \sum_{k=1}^n (\omega_{ik}^{RSCA} \cdot RSCA_{ik}) \quad (9)$$

$$\omega_{ik}^{RSCA} = X_{ik} / \sum_{i=1}^n X_{ik} \quad (10)$$

Different from formula (7), the weight is the proportion of k export of The U.S. products in the total export of category j products.

F. Data

This paper USES the UN Comtrade Database provided by unstat, annual Trade data classified by the three-digit Standard International Trade Classification Revision 2 (SITC rev.2) between 1978 and 2017.

Lall (2000) classified the three-digit classification products under SITC rev.2 according to the technical structure [15]. He defined "primary products", but did not further classify primary agricultural products and primary mineral products. In the "manufactured goods based on primary products", it is divided into "agricultural manufactured goods based on primary agricultural products" and "manufactured goods based on other resources". The author analyzed the basis of his classification and divided the primary agricultural products in "primary products" according to its intention. Among the import and export trade products with the United States as the reporting country, 33 primary agricultural products and 35 agricultural manufactured products were identified, as shown in Table I.

TABLE I. THE 3-DIGIT SITC REV.2 CODES FOR PRIMARY AGRO-PRODUCTS AND AGRICULTURAL MANUFACTURED PRODUCTS

1. Primary Agro-products (33 products)	001, 011, 022, 025, 034, 036, 041, 042, 043, 044, 045, 054, 057, 071, 072, 074, 075, 081, 091, 121, 211, 212, 222, 223, 232, 244, 245, 246, 261, 263, 268, 291, 292
2. Agricultural Manufactures (35 products)	012, 014, 023, 024, 035, 037, 046, 047, 048, 056, 058, 061, 062, 073, 098, 111, 112, 122, 233, 247, 248, 251, 264, 265, 269, 423, 424, 431, 621, 625, 628, 633, 634, 635, 641

Note: the three figures in the table are the code of SITC rev.2 for the corresponding commodity

III. EMPIRICAL RESULTS

Figure 1 depicts the time paths of IC_{ij} , $RSCA_{ij}$ and H_{ij} index of the U.S. imports of the primary agricultural products between the year of 1978 and 2017.

- The weighted average IC_{ij} index of primary agricultural products is always positive, indicating that us agricultural imports have been running a trade surplus.
- The weighted average $RSCA_{ij}$ of primary agricultural products was negative in all other years except in 1978-1980 and 1982. At least in terms of imports, the

U.S. trade in primary agricultural products is at a comparative disadvantage.

- The weighted average H_{ij} index of primary agricultural products is always positive and the value is relatively large, with the average value reaching 0.639. It reflects that the import policy of primary agricultural products of the United States is characterized by a strong restriction of import, which is greatly different from the equilibrium condition of free trade.

Figure II describes the import patterns of the U.S. agricultural manufactures.

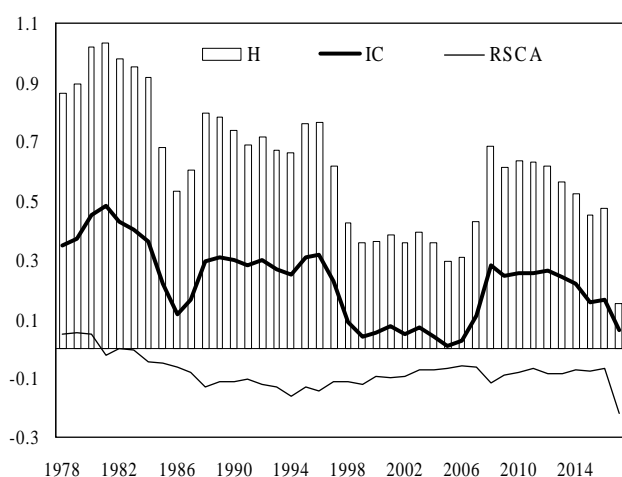


FIGURE I. IMPORT PATTERNS OF U.S. PRIMARY AGRO-PRODUCTS (1978-2017)

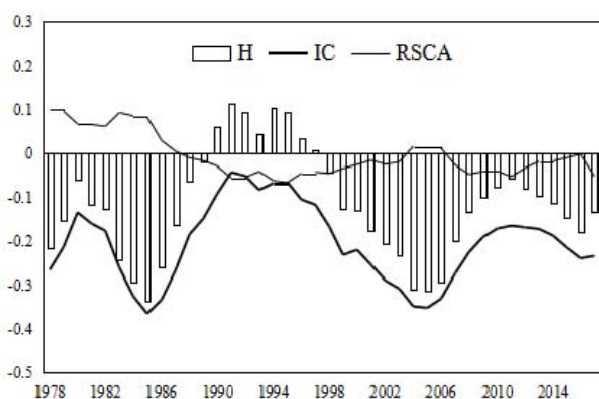


FIGURE II. IMPORT PATTERNS OF THE U.S. AGRICULTURAL MANUFACTURES (1978-2017)

The United States shows different characteristics in the U.S. import pattern of agricultural products. We find that:

- The weighted average IC_i index of agricultural manufactured goods is always negative, and the United States has a trade deficit in such products.
- The weighted average $RSCA_{ij}$ index is negative except 1978-1987 and 2004-2006, so at least as far as imports

are concerned, the U.S. trade in manufactured agricultural products is at a disadvantage.

- With the exception of 1990-1997, the weighted average H_{ij} index has been negative, which means that the U.S. policy on imports of manufactured agricultural products is not limited but encouraged.

IV. CONCLUSION

This study using the revealed comparative advantage index of symmetry ($RSCA_{ik}$) measure the degree of comparative advantage, with international competitiveness index (IC_{ik}) to measure the international competitiveness, and will be defined as the difference between the two policy intervention index (h_{ik}) is used to reflect the trade pattern and the degree of deviation between free trade and trade policy orientation, got the following four aspects: the main conclusions:

- First, the United States has a completely different position in trade in primary agricultural products and agricultural manufactured goods. The weighted average international competitiveness index shows that, except for a few years, the former has a surplus and the latter a deficit. This also indicates that it is necessary to analyze primary agricultural products and agricultural manufactured products separately.
- Secondly, the comparative advantage of primary agricultural products and manufactured goods in the United States is basically the same. The comparative advantage based on imports is not on primary agricultural products, nor on agricultural manufactured goods. Imagine using one product to speculate on trade patterns for another, and you're likely to get the same conclusions and policy recommendations as the facts.
- Thirdly, contrary to most previous studies, the United States shows a very strong protectionist tendency to restrict imports of primary agricultural products, while the import of agricultural manufactured goods is also far from free trade, but its policy tendency is to encourage imports rather than limit them. This may be due to higher labor costs in the United States, and the introduction of import incentives for agricultural manufactured goods that require some degree of processing would help to improve the welfare of the United States to a greater extent.
- Finally, in the import of agricultural manufactures, there is a significant inverse correlation between the two weighted average indicators of revealed symmetrical comparative advantage and international competitiveness. In other words, the higher the international competitiveness or net export capacity, the lower the degree of comparative advantage. It also means that attempts to increase the net export capacity of agricultural manufactured goods, and to increase their comparative advantage, are likely to be futile and even have the exact opposite effect.

It is inappropriate to infer the export trade model with the characteristics shown in the import trade model. Therefore, it is

necessary to make an in-depth analysis of the export trade model and trade policy of primary agricultural products and agricultural manufactured goods in the United States, so as to accurately grasp the real characteristics of the us agricultural trade.

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