



Methods of agricultural support measurement in China

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ABSTRACT

The assessment on agricultural support level can reflect the effect of agricultural support policy in a nation. OECD and WTO proposed two methods to measure agricultural support levels and both of them are popular approaches in discussing this topic. This paper compared these two methods and argues the differences between them. The conclusion was OECD's methods over valued agricultural support levels in developing countries. The study used China as a case to compare the analyzing results by two methods from 2002 to 2012, which proved the conclusion. Recommendations were proposed based on the results for assessment method and policy making for agricultural support in future China.

Key words: Agricultural support; assessment; method; China

INTRODUCTION

According to the fundamental view of development economics, a nation starts to support agriculture when it enters the stage of industrialization, to obtain the capital, raw materials, labor, market, which are necessary elements for industrialization. World Bank conducted a statistics based on industry countries, and the data shows that massive subsidy and support to agriculture began when the GDP per capita reached 1000 US dollars [1]. In 2003, GDP per capita in China hit \$1000 [2], and then the 'No.1 policy' each year by Chinese central government all focuses on agriculture. 11 constant 'No.1 policies' indicated that China enter the stage of massive support to agriculture.

OECD defines agricultural support policy (ASP) as support, subsidy, assistant to farmers or agriculture by government to reduce the producing costs and raise the producers' incomes [3]. The core aim of ASP is to increase the farmers' income along with the declining of producing costs. There are two major methods to measure agricultural support levels. One is producer support estimate (PSE) by OECD, and the other is aggressive measurement support (AMS) by WTO.

This study compared the methods of PSE and AMS, and measured the agricultural support level in China by both methods. The aim is to identify the difference between these two approaches and provide base for measurement of China's agricultural support levels and policy making in the future.

THE DIFFERENCES BETWEEN PSE AND AMS

The PSE by OECD and AMS by WTO are two popular methods to measure agricultural support levels in the world. The calculation by each method is introduced briefly and then the differences are discussed.

2.1 OECD's approach

OECD classifies the ASPs to three groups, producer support estimate (PSE), customer support estimate (CSE) and general service support estimate (GSSE). PSE has two parts, marketing price support (MPS) and other budget transfer (BOT).

PSE calculates the transfer to agriculture from consumers and tax-payers annually. The transfer is represented by monetary value [4]. MPS includes tariff, import quota, producing quota, administration price, public shareholding and etc. MPS establishes the transfer channel from consumers to producers. BOT is all other transfer except MPS, and it is the transfer channel from tax-payers to producers.

CSE calculates the transfer to consumers by policies annually. It includes ① the payments to ensure the domestic prices at farm gate are higher than the border prices; ② the subsidy to certain group of people, to keep the purchasing prices lower than the market prices, such as to poor, certain public sectors. CSE is a negative method, as the transfer to consumer causes higher consumer tax, which offset parts of subsidy to consumers.

GSSE is the transfer to agricultural producers by government budget in the following fields, research and development, agricultural school, agricultural inspection service, infrastructure construction, marketing, public storage and etc. the weights of these seven types of services are adjusting temporarily.

In the classification of ASPs by OECD, PSE occupies the largest part, and is also the key indicator to reflect agricultural support levels [5]. Generally, the value of PSE implies the level of support. As discussed above, PSE is consisted by MPS and BOT. PSE is a stationary measurement value.

2.1.1 MPS calculation

MPS calculates the support to agricultural producers annually by monetary value. The support is conducted by changing the market prices through government agricultural support policies. The difference between domestic market price and border price multiple the producing volume of a certain product determines the support value on this product. The MPS is the sum of support values to each major agro product in a country.

The calculation of MPS is based on the food consumption structure in OECD countries, and covers 15 essential agro products, including, wheat, maize, grain, rice, rapeseed, soybean, sunflower, fine sugar, milk, beef, mutton, cotton, pork, poultry and egg. These 15 types of agro products occupied 70% of total value of production in agriculture in OECD countries. If the production value of a product cannot reach 1% of the total value of production, it is not included in MPS calculation. The covering types of agro products in MPS can be adjusted according to the agro product structure in a country, but the sum should be more than 70% of the total value of production.

Based on the discussion above, MPS is the sum of support to 15 types of agro products, which can be described as below:

$$\frac{MPS_C}{VP_C} = \frac{\sum_{i \in \text{ANC}} MPS_i}{\sum_{i \in \text{ANC}} VP_i}$$

MPS_C is the total price support in a country; VP_C is the total value of agricultural production in this country; $\sum_{i \in \text{ANC}} MPS_i$ is the sum of market price support on each agro product; $\sum_{i \in \text{ANC}} VP_i$ is the sum of production value of each agro product.

Thus, the market price support to a country can be described as:

$$MPS_C = \frac{\sum_{i \in \text{ANC}} MPS_i}{\sum_{i \in \text{ANC}} VP_i} \times VP_C$$

2.1.2 BOT calculation

BOT includes: ① the budget transfer to agricultural producers; ② the service for agricultural production in farms to agricultural producers; ③ the value of general service to collective producers; and ④ transfer payment to consumers.

BOT exists in various levels of government administrations and it uses the real expenses rather than the budget numbers for calculation. The costs for policy implementation and assessment, overlap in the budget for MPS policies are excluded. BOT also includes revenue free policy, such as tax free, preferential loan, debt relief, preferential price for producing materials and services.

2.1.3 PSE calculation

According to the constitution of PSE, MPS and BOT are two parts for calculation. Thus, PSE can be described as

$$PSE_c = MPS_c + \sum BOT = \frac{\sum_{i=AMS} MPS_i}{\sum_{i=AMS} VP_i} \times VP_c + BT_c + RFc$$

PSE_c is the agricultural support estimate for a country; MPS_c is the marketing price support value; BOT is the budget transfer support and other support value; BT_c is the budget transfer value; RFc is the support value from revenue free.

2.2 WTO's approach

The measurement on agricultural support levels by WTO is proposed in the Uruguay Round in its former organization, General Agreement on Tariffs and Trade (GATT). WTO defines the Total AMS contains AMS, green box, blue box, and *de minimis*[6]. AMS calculates the domestic support policies which has direct or potential impact to agricultural production and trade. It includes the product-specific AMS and non-product-specific AMS. The support level is presented by monetary values.

AMS has market price support and government budget support. The names of support are similar to PSE but there are differences in detailed calculation. AMS can be described by the following formulas.

$$AMS = MPS_w + \sum BT = |AP - FOB| \times VP_w + \sum BT$$

or

$$AMS = MPS_w + \sum BT = |AP - CIF| \times VP_w + \sum BT$$

AMS is the aggressive domestic support value; MPS_w is the market price support value by WTO; BT is the budget transfer value; AP is the governmental administration price; FOB is the border price for export countries and CIF is the border price for import countries; VP_w is the value of production under the influence of policies.

2.3 Comparison between PSE and AMS approaches

Both PSE by OECD and AMS by WTO are based on the calculation of MPS and budget transfer. The aim of PSE is to exam and assesses the policy reform progress on agricultural support and the goal of AMS is to provide legal basis for domestic support reduction in agricultural international trade agreements. These two methods are similar but with differences.

2.3.1 Differences in MPS calculation

Compared to PSE, the calculation method and coverage of MPS in AMS are different. MPS in AMS is not calculated based on individual agro products but the government administration price in the domestic support. PSE identifies the price difference between farm gate and border on a particular product, and AMS reflects the difference between government administration price and fixed external price. Government administration price is price for government purchasing activities or the target price based on balance of payments. Fixed external price is the FOB price for net export countries or CIF for net import countries on the base period. The base period is the world basic price from 1986 to 1988. Thus, the value of market price support by AMS is not fluctuated frequently along with the change of domestic and world prices. Besides, in calculation of the volume of production, AMS uses the volume which is influenced by the policy rather than the total value of production. MPS by AMS valued less than by the method of PSE.

2.3.2 Coverage and target

PSE covers all transfer payment to agriculture by policies and concentrates on the impact measurement on

individual agricultural producers. AMS only covers the domestic support policies that distort the agricultural international trade and exclude support by border measurement, such as tariff and export subsidy. WTO links the domestic agricultural support and agricultural international trade closely.

ASSESSMENT ON CHINA'S AGRICULTURAL SUPPORT LEVELS

To illustrate the difference of PSE and AMS, the agricultural support level of China is used as a case for further analysis. According to the official data from OECD and WTO, figure 1 shows the change of agricultural support level in China from 2002 to 2012. WTO only releases the AMS data by 2008, and this research only retrieves the AMS data from 2002 to 2008. The commitment of China entering WTO is the domestic support to agriculture limited to 8.5% of the total value of production. The dotted curve in figure 1 represents the limit.

3.1 Value of PSE is more than AMS

As shown in figure 1, the curve of AMS stays below the curve of PSE, and the distance between them are various with an enlarging trend. As discussed in the previous section, the calculation method for MPS by OECD and WTO is different. AMS is based on the government administration price and 1986 to 1988 base period price, while PSE calculates the difference between farm gate price and border price. The fluctuation of former is less than the latter. Thus, agricultural support level in China is less by AMS than the one by PSE.

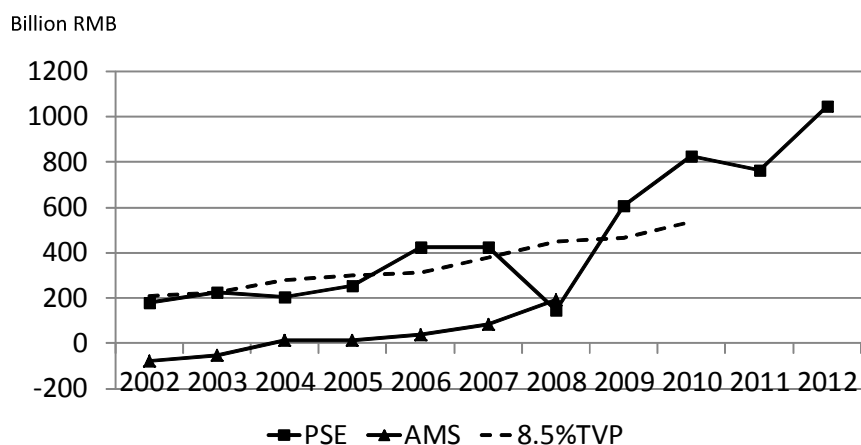


Fig.1 The agricultural support level assessment by PSE and AMS
Data Resources: OECD, WTO

3.2 The PSE indicator over-valued agricultural support levels in China

The OECD method on agricultural support measurement is designed based on the economy environment and market features in the developed countries. China is still a developing country and there is a half self-sufficient status in the rural economy. The self-sufficient food consumption enlarged the support level assessed by PSE. Besides, the administrative organization in China is relative loose and low efficient. Rent-seeking behavior commonly exists. The effect of agricultural support policies is reduced during the implementation. Thus, PSE indicator over valued the agricultural support levels in China.

3.3 AMS indicates plenty space for the increase of agricultural support in China

According to the China's commitment to WTO, the domestic support on agriculture cannot surpass 8.5% of total value of production. As shown in figure 1, before 2004, AMS are negative values, which indicates that agriculture did not only receive support from industry, but support industrialization in these years. After 2004, the total support value kept increasing. In 2007, the growing speed accelerated but the overall level is low. There is a big distance to reach the limit of domestic support. Thus, by the AMS indicator, China has plenty space for the growth of agricultural support levels.

SUGGESTIONS TO AGRICULTURAL SUPPORT MEASUREMENT AND POLICIES IN CHINA

According to the discussion above, suggestions to the measurement and policy making for China's agricultural support are proposed as below.

4.1 Apply both methods as the reference for policy making

As the major measurement methods, both PSE and AMS have to be introduced to assess the agricultural support levels in China. As PSE over values the support levels in developing countries, the absolute value of PSE is not considered but the change of it could reflect the change of effect from agricultural support policies.

4.2 Accelerate the growth of agricultural support

According to the AMS data, the level of agricultural support has not reached the limit of 8.5%. China has a large rural population. The value of support per capita is low. The growth of agricultural support should be accelerated under the capacity of government budget.

4.3 Concentrate on the support in green box and promote the competitive of agriculture

According to the PSE data, the agricultural support occupied 17% of the farm income in 2012, which is approaching the average value of 19% in OECD countries[7]. Although the OECD method over values the support level in developing countries, the structure of support should be noticed. From the perspective of long term, agricultural support in China should focus on GSSE, or the green box by WTO, to promote the consistency and competitiveness of agriculture.

4.4 To set reasonable support level targets and avoid the unnecessary financial stress to government

China has to set up its own assessment methods based on the approaches by OECD and WTO. The measurement method should reflect the rural economy features in developing countries. Based on the assessment, a reasonable target for support should be proposed to ensure adequate support to agriculture to provide incentive to agricultural producers, and avoid extra unnecessary support which may waste the fiscal resources.

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