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# **Asian Rice Policies and WTO Commitments on Domestic Support Under Existing and Proposed Doha Round Provisions**

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# **Asian Rice Policies and WTO Commitments on Domestic Support Under Existing and Proposed Doha Round Provisions**

## ***Abstract***

*We examine current rice policies in four major Asian countries (China, Japan, Korea, and Taiwan), their relationship to current WTO disciplines, and to those proposed under the Doha negotiations. WTO disciplines have prompted some changes in rice policies, but disciplines of domestic support are unlikely to impose serious constraints in the future. Using the example of Taiwan, we examine how existing support policies could be changed to reduce domestic distortions and satisfy WTO commitments. Changing from existing amber box payments to those that would likely qualify for inclusion under the blue or green boxes could allow greater market orientation in Taiwan's rice market, while satisfying food security and farm income support objectives.*

## **I. Introduction**

Rice is the staple food and a major crop in Asian countries. Regional production accounts for 90 per cent of the world total, but the share of exports is less than 25 per cent. The ratio of world exports to production is less than 5 per cent. These figures reflect the fact that Asian countries have emphasized self-sufficiency in rice. However, the situation has been changing since the WTO was created and the Agreement on Agriculture (AoA) was implemented in 1995. Many Asian countries, which did not allow imports of rice, were forced to open their markets. This has affected domestic policies related to production, structural adjustment and competitiveness. Market price support programs have been restricted or changed under AoA requirements. Taiwan, for example, has changed its policy objectives from self-sufficiency to achieving a better balance between total supply (domestic production plus imports), demand, and stocks.

The latest round of WTO negotiations under the Doha Development Agenda (DDA) has been ongoing for over 10 years. It has been difficult to reach a final agreement on agriculture in the face of differing national perspectives on such issues as food security, environmental protection, and rural development. A 123-page draft modalities text was released on December 6, 2008 by Ambassador Crawford Falconer, the then chair of the agricultural negotiations. These involve tiered formulas for cutting tariffs and trade-distorting subsidies, and related provisions. The purpose of this paper is to explore the effects of domestic support reduction proposals in the draft modalities on rice policy in four major Asian countries – China, Japan, Korea, and Taiwan. The paper draws upon earlier work in this area for a range of countries by

Orden et al. (2011).

The paper is organized into six further sections as follows: a description of the AoA and the proposed draft modalities relating to domestic support in the four countries; an examination of the evolution of rice policies since 1995; an assessment of the domestic support picture revealed by WTO notifications; an evaluation of possible changes in domestic support based on the draft modalities; some options for rice policy changes in Taiwan; and a summary of conclusions.

## **II. The agricultural negotiations framework and GATT/WTO modalities**

Agriculture first entered substantively into the General Agreement on Tariffs and Trade (GATT) during the Uruguay Round negotiations of 1986-1994. The Agreement on Agriculture (AoA) was concluded with the objective “to provide for substantial progressive reductions in agricultural support and protection sustained over an agreed period of time, resulting in correcting and preventing restrictions and distortions in world agricultural markets.” The AoA involves three pillars: market access, domestic support, and export competition. These pillars have also been the focus of the agricultural negotiations under the Doha Development Agenda.

### **1. The Agreement on Agriculture**

The AoA disciplines the most trade-distorting domestic subsidies (amber box) by placing a limit on the maximum amount of support measured by the Aggregate Measurement of Support (AMS). This includes market price support (measured in a way defined in the Agreement) and product-specific and non-product-specific payments that are linked to production. Countries that notified a Total AMS (TAMS) in their Uruguay Round schedules were required to bind the maximum permitted amber box support at that level and implement a phased percentage reduction. Product-specific support that is less than an agreed percentage of the value of production of the commodity concerned is excluded from the calculation of the Current TAMS (CTAMS), as is non-product-specific support that is less than an agreed percentage of the total value of agricultural production. The CTAMS is required to be less than the Final Bound TAMS (FBTAMS), the assumption being that if these are close together there will be an incentive to reform policies in a less distorting direction.

In addition to the amber box, a blue box category was defined for payments that involved a limitation on production. Such payments are not included in the CTAMS and are not disciplined under the Agreement. A green box category was also defined for payments that are considered to be minimally production and trade distorting. This includes payments under environmental programs, structural adjustment programs, direct payments that are decoupled from current production, and payments under a

variety of other programs.

With respect to market access, the AoA required that bound tariffs be established for agricultural products; some modest reductions were made in these. To provide for some market access under high tariffs, tariff-rate quotas were introduced under which a specified amount of imports is subject to lower or zero tariffs. Export subsidies are disciplined through limitations on the total amount of subsidies and the quantity of subsidized exports.

## 2. The Doha draft modalities for agriculture

The Doha draft modalities involve further modifications to the rules governing domestic support, market access, and export competition. To some extent these impose additional restrictions, but also allow greater flexibility. Export subsidies and other forms of export assistance are targeted for elimination or control. Under the market access provisions countries will be allowed to declare a certain number of tariff lines as “sensitive products” for which they can choose to make smaller tariff reductions in exchange for a TRQ expansion. Developing countries can identify a certain percentage of tariff lines as “special products” exempt from tariff reductions.

With respect to domestic support, a new concept of the Overall Trade-Distorting Domestic Support (OTDS) is defined as the sum of the TAMS, *de minimis* and blue box. A tiered reduction formula is proposed from a base OTDS level. Tiered reductions also apply to the TAMS in addition to a binding on total blue box support and reductions in *de minimis*. There are product-specific limits on the AMS and blue box payments. Special and differential treatment is provided for developing countries and there are provisions for recently-acceded members (RAMs) with differences in required reductions, base and implementation periods. The draft modalities for agriculture are summarized in Table 1.

Table 1 Summary of domestic support proposals in the draft Doha modalities for developed, and developing countries and RAMs

Members	Developed Countries	Developing Countries and RAMs
Overall	Sum of:	Sum of:
Trade-Distorting	(1) the Final Bound Total AMS	(1) the Final Bound Total AMS
Domestic Support (OTDS)	(2) 10% the average of total value of agricultural production (base period=1995-2000) (3) max { average blue box payments, 5% of the average total value of agricultural production }	(2) 20% the average of total value of agricultural production (base period=1995-2000 or 1995-2004) (3) max { average blue box payments, 5% of the average total value of agricultural production }
OTDS: <i>Tiered reduction formula</i>	<ul style="list-style-type: none"> <li>• If OTDS &gt; 60 billion, then reduction rate shall be 80%.</li> <li>• If 10 &lt; OTDS ≤ 60 billion, then reduction rate shall be 70%.</li> <li>• If OTDS ≤ 10 billion, then reduction rate shall be 55%.</li> </ul>	<ul style="list-style-type: none"> <li>• If OTDS &gt; 60 billion, then reduction rate shall be 80% × 2/3.</li> <li>• If 10 &lt; OTDS ≤ 60 billion, then reduction rate shall be 70% × 2/3.</li> <li>• If OTDS ≤ 10 billion, then reduction rate shall be 55% × 2/3.</li> <li>• The reductions shall be implemented in nine steps over eight years.</li> </ul>

	<ul style="list-style-type: none"> <li>• The reductions shall be implemented in six steps over five years.</li> </ul>	<ul style="list-style-type: none"> <li>• Developing country Members with no Final Bound Total AMS commitments shall not be required to undertake reduction commitments in their Base OTDS.</li> </ul>
Total AMS: <i>Tiered reduction formula</i>	<ul style="list-style-type: none"> <li>• If AMS &gt; 40 billion, then reduction rate shall be 70%.</li> <li>• If 15 &lt; AMS ≤ 40 billion, then reduction rate shall be 60%.</li> <li>• If OTDS ≤ 15 billion, then reduction shall be 45%.</li> <li>• The reductions shall be implemented in six steps over five years.</li> </ul>	<ul style="list-style-type: none"> <li>• If AMS &gt; 40 billion, then reduction rate shall be 70% × 2/3.</li> <li>• If 15 &lt; AMS ≤ 40 billion, then reduction rate shall be 60% × 2/3.</li> <li>• If OTDS ≤ 15 billion, then reduction shall be 45% × 2/3.</li> <li>• The reductions shall be implemented in nine steps over eight years.</li> </ul>
Product-Specific AMS Limits	Average of the product-specific AMS during the Uruguay Round implementation period, 1995-2000.	Choose one of the following methods: (a) the average product-specific AMS during the base period; or (b) two times the Member's product-specific <i>de minimis</i> level; or (c) 20 % of the Annual Bound Total AMS
<i>de minimis</i>	It shall be reduced by no less than 50 per cent effective on the first day of the implementation period.	<ul style="list-style-type: none"> <li>• It shall be reduced by at least two-thirds of the reduction rate in three years from the first day of implementation.</li> <li>• Developing country Members with no Final Bound Total AMS commitments shall continue to have the same access as under their existing WTO obligations to the limits provided for product-specific and non-product-specific <i>de minimis</i>.</li> <li>• Other RAMs with Final Bound Total AMS commitments and which have existing <i>de minimis</i> levels of 5 per cent shall reduce such levels by at least one-third of the reduction rate and the timeframe for implementation shall be five years longer.</li> </ul>

Source: WTO (2008c).

### III. Asian Rice Policies

Since the AoA entered into force in 1995 there have been some changes in rice policies in Japan, Korea, Taiwan, and China. These are now briefly reviewed.

#### 1. Japan

At the beginning of 1995, Japan opened its rice market to foreign suppliers through a Minimum Access (MA) provision. Imports were increased by 0.8 per cent of total consumption until Japan converted the MA to a Tariff Rate Quota (TRQ) system in 1999. The out-of-quota tariff rate was set at 341 yen per kg to prohibit imports in excess of the MA quantity. The Food Control Law was replaced with the Staple Law in 1995, which deregulated rice prices and relaxed government control of distribution. In 1998, government procurement of rice at a guaranteed price was terminated, being replaced by purchases at market prices for food security stock-holding. In the same year, a new rice policy was introduced with three parts: rice production adjustment through an acreage control program, direct payments through the Japanese Rice Farming Income Stabilization Program (JRIS), and liberalization of the distribution system. Eligible rice producers under the JRIS have to participate in the acreage control program. The variable payment under the JRIS, involving a production limitation, has been notified under the blue box.

Further changes in policy were introduced in 2004. Production adjustment was changed from controlling acreage to controlling quantity, and planned distribution was eliminated. The allocation of conversion payments was decided by local agricultural committees to encourage local participation. In addition, rice farmers could choose to market their own rice rather than through the Japanese farmers' association (JA). The JA could no longer dominate pricing in the rice market. The government's role was changed from price control to quantity management through stocks, imports, and production adjustment.

In 2007, a new income stabilization program involving direct payments was introduced. This only applies to larger farmers, in order to facilitate improvement in rice production structure and to reduce blue box payments. In 2011, Japan initiated the new Basic Law on Food, Agriculture and Rural Areas, which emphasizes increasing the food self-sufficiency ratio. This involves an income stabilization program with a combination of a fixed payment and variable payment for individual farm households who plant food crops included rice, wheat, barley and soybeans, and participate in the production quantity target program. For rice, for example, the fixed payment is 150,000 yen per hectare, and a variable payment depends on the price difference between the previous three-year moving average of market prices and the current market price.

## **2. Korea**

Korea imported rice under MA from 1995 with the quantity increasing to 308 thousand tons in 2008. The government purchased domestic rice at a guaranteed price from 1984 to 2005. The main reason for terminating the program was that the rice AMS had reached over 90 per cent of the FBTAMS. There was very little room for raising the guaranteed price or increasing rice purchases. In 2005, the market price support policy was replaced by a scheme involving a fixed payment and a variable payment. A public rice storage system was also established, similar to the one in Japan with government purchases of rice at market prices for food security stock-holding.

Direct payments were derived from the integration of those under earlier schemes – the Paddy Field Farm Payment program, which was the base for a fixed payment of 532,000 won per hectare, and the Rice Income Insurance Payment program, which was the base for the variable payment calculated as 85 per cent of the difference between a target price and the market price, minus the fixed payment. Since the target price was slightly higher than the earlier guaranteed price, the policy transition was relatively smooth.

## **3. Taiwan**

In Taiwan, the government has had a program for purchasing rice at guaranteed prices since 1974. However, the program became increasingly expensive and led to

over production. Government was forced to use set-aside and land diversion provisions to address the problem. On the one hand rice production is encouraged through a guaranteed price; but on the other hand it is discouraged through set-aside and diversion payments. In 2010, rice production was 1.45 million tons. Paddy field area, fallow area, and diversion area were 255,415, 209,629, and 49,481 hectares, respectively. Government expenditure on rice purchases, set-aside, and diversion were NT\$ 4.2 billion, 9.3 billion, and 1.4 billion, respectively. In order to balance supply and demand, the government has raised set-aside payments while accommodating increasing rice imports. For example, the set-aside payment was raised from NT\$ 41,000 to NT\$ 45,000 per hectare in 2004.

Although Taiwan was not a member of the WTO until 2002, it first opened its domestic rice market to foreign countries in 1995. Under the MA commitment upon accession, Taiwan imported 4 per cent of total consumption. With a rapid increase in imports, similar to the Japanese experience, Taiwan adopted a TRQ system in 2003. Currently, the import quota is 144,720 tones, 35 per cent of which enters the domestic market by auction, and the rest is imported by the government. The in-quota tariff for rice is zero, and the out-of-quota tariff is NT\$ 45 per kg.

Purchases of rice at guaranteed prices are based on a three-tiered system: planned purchase, supplementary purchase, and additional purchase. The quantities and prices are shown in Table 2. The sum of the quantities under the three tiers exactly equals total production. The weighted average of guaranteed prices is NT\$ 20.25 and 20.22 respectively for the first and second crop plantings in a single year.

Table 2 Price support program for rice in Taiwan

Program	planned purchase		supplementary purchase		additional purchase	
	price	quantity	price	quantity	price	quantity
units	NT\$/kg	kg	NT\$/kg	kg	NT\$/kg	kg
1 <sup>st</sup> crop	23.00	1,920	20.00	1,200	18.60	3,000
2 <sup>nd</sup> crop	23.00	1,440	20.00	800	18.60	2,360

Source: COA (2010).

Rice farmers consider the difference between guaranteed price and the market price in deciding whether to sell rice to the government. The total purchased quantity shown in Table 3 is the main source for food security stocks. Since the government absorbs production at the margin, this has the effect of supporting market prices. Consequently, the market price is usually located around the supplementary purchase guaranteed price level. Recently, government purchased quantity has been below 15 per cent of domestic production, plus 65 per cent of TRQ imported by government



which accounts for 8 per cent of consumption. The sum of these two sources annually for government stock-holdings for food security should be equal to three months consumption, which is set in the Law of Food Management.

Table 3 Government purchases of paddy rice in Taiwan

	Production quantity (a)	Purchase quantity in sum (b)	b/a	planned purchase	supplementary purchase	additional purchase
units	m.t.	m.t.	%	m.t.	m.t.	m.t.
2005	1,467,138	210,949	14.38	167,419	39,811	3,718
2006	1,558,048	245,659	15.77	215,993	29,423	244
2007	1,363,458	216,180	15.86	172,046	43,199	935
2008	1,457,175	205,194	14.08	162,956	41,837	401
2009	1,578,169	182,596	11.57	174,173	8,278	145
2010	1,451,011	191,050	13.17	172,883	17,571	596

Source: COA (2010).

Historically, planned and supplementary purchases have co-existed for a long time. The additional purchase appeared in 2003 to prevent market prices from falling below the average costs of production. It reinforced the determination of the government to support farmers' incomes. Since guaranteed prices have a major impact on incomes, there is generally pressure to raise these. The latest example was in 2008, when guaranteed prices in the three-tiered government purchase system were all raised by NT\$ 2 per kg. Although this had the effect of increasing the rice AMS by NT\$ 283 million, it had a positive impact on food security stocks; supporting farmers' income and the market price.

In general, Taiwan's rice policy is based on three pillars: government purchases at guaranteed prices, set aside, and imports under the TRQ. These pillars are nominally independent, but are connected. For instance, raising the guaranteed price for additional purchases would stimulate rice production, and require an increase in the set-aside payment to maintain stability. Farmers' incomes in either case would be increased. If there is a TRQ expansion or an out-of-quota tariff reduction and a corresponding increase in imports, government purchases would increase and the financial burden would rise, set-aside payments would also increase. The implication is that it would be difficult to maintain the existing policy if imports are increased significantly. If the program of purchasing rice at a guaranteed price were to be eliminated, set-aside and diversion policies would also need to be reviewed. If farmers' incomes and food security are to continue to be key objectives, other options may need to be examined.

#### 4. China

China is the largest country in terms of rice production and consumption. In 2010,

its paddy area was 30 million hectares, producing paddy rice of 197 million tons or about 30 per cent of the world total. To satisfy the consumption of its huge population, the government has targeted the achievement of high output. China is capable of maintaining self-sufficiency in rice. With increasing per capita income, rice consumption is shifting from quantity to quality and diversity. Correspondingly, the government implemented a structural improvement policy at the end of 1990's to enhance high-quality rice production. An earlier procurement policy based on a single grade of "early India paddy" was replaced in 2000 by one with tiered purchase prices to encourage farmers to produce higher-quality rice.

China implemented a new food policy in 2001, creating certain areas as market sales area, eliminating the purchases of fixed quantities from farmers and price controls, and establishing others as protected production areas, in which more interventionist policies are maintained. The market areas, including Zhejiang, Shanghai, Fujian, Guangdong, Hainan, Jiangsu, Beijing, and Tianjin, are located in the coastal region where much of China's rapid economic development has been taking place. The protected production areas, including Heilongjiang, Liaoning, and Jilin, are located in the northeast region. In this region state-owned grain bureaus make purchases at guaranteed prices, provide subsidies for risk management, and there is public investment in infrastructure to stimulate food production. The new policy has changed the market shares of the two regions and increased the share of medium size Japonica rice. The government also began to reduce agricultural taxes and implemented a minimum price procurement program in 2004, before totally eliminated the tax in 2006. As a result China has moved away from taxation to support, although since the price under the minimum price procurement program is lower than the market price no support purchases have actually been triggered.

In 2008, China both imported and exported rice: 330 thousand and 970 thousand tons, respectively. The WTO import commitment is through a TRQ. The quota was increased from 3,325 thousand tons to 5,320 thousand tons in 2004. The state-owned grain bureaus import 50 per cent of the import quota. The in-quota tariff is 1 per cent and the out-of-quota tariff is 65 per cent. With respect to exports, China committed to the elimination of export subsidies on agricultural products in 2004, but still has some regulations for exports, including controls on exports and export taxes.

## **5. Comparisons**

A comparative summary of rice policies in China, Japan, Korea, and Taiwan is given in Table 4. Although there are different policy features and instruments, measures can be categorized under market price support, direct payments, import controls, and input subsidies or taxes. Policy objectives explicitly focus on food sufficiency, price stability, and farmers' incomes. It is not easy to change existing

policies, because of the need to satisfy multiple objectives. This creates complexity in managing the policy environment in the context of WTO commitments.

Table 4 Rice policy comparison for four Asian countries

	Japan	Korea	Taiwan	China
Fixed payment	V	V		
Variable payment	V	V		
Government purchase at guaranteed price			V	V
Food security stock-holding at market price	V	V		
Diversion payment	V		V	
Set-aside payment			V	
Tariff Rate Quota (TRQ)	V		V	V
Minimum Access (MA)		V		

Source: Authors' assessment.

#### IV. Analysis of WTO notifications under domestic support commitments

Support provided to agriculture is supposed to be notified annually to the WTO. However, there are often time lags. In this discussion we use both the official notifications and some estimates or “shadow notifications” through 2008.

##### 1. Japan

Total domestic support payments were 6,185 billion yen in 1996, included green box payments of 2,818 billion yen (45%) and amber box payments of 3,367 billion yen (55%). After subtracting *de minimis*, the CTAMS was 3,330 billion yen, which was 72 per cent of the FBTAMS. Most of the CTAMS was attributable to government purchases of rice at the guaranteed price. The share of rice in the CTAMS reached 76 percent in 1997. Given such increases market price support policy had to change. The Japanese government substituted the JRIS program for the price support policy in 1998, for which a variable payment and a fixed payment was notified as blue box and green box, respectively. The first blue box payment was 51.2 billion yen. The CTAMS was reduced significantly to 767 billion yen, and green box payments were increased slightly to 3,002 billion yen.

Since 1998 the rice AMS has almost disappeared, and blue box payments have been maintained around 70 billion yen. Blue box payments were further reduced to 32 billion yen in 2007. Notified green box payments decreased from 3,001 billion yen to 1,887 billion yen in 2008. The main reason for this was a reduction in expenditure on infrastructural services for the agricultural sector and rural areas. Green box payments have also included expenditures for public stockholding for food security purposes, school lunch programs, and environmental programs.

Table 5 Summary of notifications of domestic support for Japan, 2002-2008

Unit: billion yen

Year	Notifications											Shadow notifications	
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Green box	2,818	2,652	3,002	2,686	2,595	2,295	2,275	2,086	2,098	1,916	1,802	1,796	1,887
Blue box	0	0	51.2	92.7	92.7	91.1	86.5	68.2	67.8	65.3	70.1	42.4	32.4
Final Bound Total AMS	4,635	4,470	4,304	4,138	3,9723	3,9723	3,9723	3,9723	3,9723	3,973	3,973	3,973	3,973
Current Total AMS	3,330	3,171	767	748	709	667	730	642	608	593	571	509	511
Rice AMS	2,557	2,398	42	0	0	0	0	0	7.5	7.5	2.3		
Total value of rice production	3,054	2,779	2,515	2,376	2,321	2,228	2,172	2,342	1,991	1,947	1,815	1,790	1,901
Rice AMS/ production value	84	86	1.67	0.00	0.00	0.00	0.00	0.00	0.38	0.39	0.13		
Product-specific AMS <i>de minimis</i>	11.4	11.7	53.1	10.4	10.8	12	23.2	16.9	24.1	23.2	18.6	15.4	15.4
Non-product-specific AMS <i>de minimis</i>	25.9	24.4	22.4	22.2	20.9	20.1	20.4	18.1	17	18.1	19	18.0	73.5
Amber Box	3,367	3,207	842	780	740	699	774	677	649	635	609	542	600

Source: WTO (2008a) and Godo and Takahashi (2011).

## 2. Korea

Total domestic notified domestic support in Korea was 8,381 billion won in 1997, comprised primarily of green box (5,796 billion won) and amber box (2,584 billion won). Korea has Special and Differential Treatment for 38 billion won under development programs for investment and input subsidies to poor producers. Green box and amber box payments have been kept at ratio of roughly 70: 30. Korea notified its support until 2004, but its rice policy changed from 2005. We have estimated its domestic support for 2005-2008.

The CTAMS has been close to the FBTAMS. In 2004, the rice AMS of 137 billion won was 94 per cent of the CTAMS. Facing pressure to raise guarantee prices, Korea followed Japan's example by terminating market price support for rice in 2005, replacing this by a direct payment. However, since there was no production-limiting requirement, the variable payment was still notified as AMS. In 2005, the rice AMS was reduced to 90 billion won. The variable payment was zero in 2008, because the market price plus the fixed payment was higher than the target price. The fixed payment was notified as green box and was 62 billion won in 2008, roughly equal to that in 2005.

Green box payments have primarily been composed of infrastructural service expenditures, including the irrigation and drainage improvement projects, roads, and wholesale agricultural markets, etc. The primary expenditure relating to rice has been public stockholding for food security purposes, which amounted to 162 billion won in

2004. Such expenditures are expected to increase, because of the establishment of a public storage system under which the government purchases rice at market prices.

Table 6 Summary of notifications for domestic support for Korea, 2002-2008

	Unit: billion won											
	Notifications								Shadow notifications			
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Green box	5,796	5,361	5,456	5,054	5,668	6,035	5,689	4,867				
Special and Differential Treatment	37.8	41.5	62.1	50.6	66.26	57.45	59.43	54.14				
Blue box												
Final Bound Total AMS	2,029	1,952	1,875	1,798	1,721	1,644	1,567	1,490				
Current Total AMS	1,937	1,563	1,552	1,691	1,631	1,550	1,522	1,458	988	525	367	88
Rice AMS	1,884	1,510	1,503	1,647	1,583	1,504	1,476	1,371	901	437	279	0
Total value of rice production	9,193	9,183	10,045	10,505	10,722	9,556	8,836	9,963	8,537	8,406	7,858	9,380
Ratio of rice AMS in rice production value (%)	20.50	16.44	14.96	15.68	14.76	15.74	16.70	13.76	10.55	5.20	3.55	0
Product-specific AMS <i>de minimis</i>	254	258	82	114	177	279	229	106				
Non-product-specific AMS <i>de minimis</i>	393	526	405	413	396	501	414	437				
Amber Box	2,584	2,346	2,039	2,217	2,204	2,331	2,165	2,002				

Source: WTO (2008b) and authors' calculations.

### 3. Taiwan

Although Taiwan was not yet a Member of the WTO, it began to implement the AoA in 1995. It did not notify support until it entered the WTO in 2002. The framework of agricultural policy in Taiwan was unchanged. Rice policies are still based on government purchases at guaranteed prices and set asides. Domestic support payments are notified under the amber and green boxes. In 2002, total domestic support was NT\$ 35 billion, of which 25 per cent was amber box. After subtracting *de minimis* of NT\$ 1.6 billion, the CTAMS was NT\$ 7.1 billion, which was lower than the FBTAMS of NT\$ 12.2 billion.

By 2008, the CTAMS had declined to NT\$ 4 billion or 28 per cent of the bound level. This situation was quite different from Japan and Korea; their percentages were 77 per cent and 94 per cent, respectively. This might explain why Taiwan has been able to keep the same rice policy. However, the amber box increased to over NT\$ 12 billion in that year, because of a large subsidy on fertilizer. The non-product-specific *de minimis* was about 2.5 per cent of the total value of agricultural production.

The rice AMS in 2008 was NT\$2.77 billion or 70 per cent of the CTAMS. The government added an additional purchase program in 2003 and raised guaranteed prices by NT\$ 2 per kg in 2008. The rice AMS did not increase significantly since the

market price increased and the quantity purchased did not rise.

The formula for market price support in the rice AMS is:

$$AMS = \sum_{i=1}^3 (GP_i - EP) \times GQ_i,$$

where  $GP_i$  is the  $i^{\text{th}}$  guaranteed price component for planned, supplementary, and additional purchases, respectively;  $EP$  is the external reference price of NT\$ 8.92 per kg, which was based on the CIF price of rice imported by Hong Kong in 1990-1992;  $GQ_i$  is the actual purchase quantity under the  $i^{\text{th}}$  guaranteed price program, equivalent to the definition of “eligible production” in the AoA. In fact,  $GQ_i$  is determined by farmers who sold paddy rice to the government based on the price difference between the guaranteed price and the market price. The larger the price difference, the larger the quantity of government purchases kept as stocks for food security, and the larger the increase in the rice AMS. The purchased quantity was 205 thousand tons in 2008, which was 14 per cent of production.

If the market price support policy was replaced by a direct payment, it would cause quite different results, depending on whether production-limiting measures were used. For example, in Korea, the variable payment applied to total production with no production-limiting measures would still affect the rice AMS. In contrast, Japan’s variable payment with production limitation can be counted in the blue box.

Table 7 Summary of notifications of domestic support by Taiwan, 2002-2008

Year	Notifications						Shadow
	2002	2003	2004	2005	2006	2007	notifications
Green box	26,009	26,974	31,767	35,277	28,964	32,198	
Blue box							
Final Bound Total AMS	14,165	14,165	14,165	14,165	14,165	14,165	14,165
Current Total AMS	7,057	7,534	4,758	4,043	4,180	3,650	4,013
Rice AMS	4,539	5,332	2,978	2,418	2,883	2,485	2,768
Total value of rice production	32,018	28,342	27,511	28,140	29,380	26,091	31,363
Ratio of rice AMS in rice production value (%)	14.18	18.81	10.82	8.59	9.81	9.52	8.83
Product-specific AMS <i>de minimis</i>	406	367	318	321	320	294	305
Non-product-specific AMS <i>de minimis</i>	1,173	510	625	1,220	2,512	3,043	8,159
Amber Box	8,637	8,411	5,701	5,585	7,012	6,986	12,477,000

Source: WTO (2010b) and authors’ calculations.

#### 4. China

China’s notifications date from 1999, before it entered the WTO at the end of

2001, but official figures are only available for 1999-2004. Although China is a developing country member of the WTO, it is not eligible for Special and Differential Treatment and the *de minimis* of 8.5 per cent is lower than other developing countries. Agricultural policies in China are in the process of changing from implicit taxes to subsidies. The amber box payment became positive in 2004. The rice AMS was -68 billion RMB in 1999, due to government purchases at an intervention price of 1.152 RMB per kg below the external reference price of 2.659 RMB per kg. In 2004, the rice AMS was roughly 3 billion RMB, which included the effect of minimum price procurement and a subsidy for improved crop strains and seeds (WTO, 2010a). Product-specific and non-product-specific *de minimis* payments have been increasing, but since these are far below 8.5 per cent of the value of production they have been below the effective limit. Accordingly, China's CTAMS is zero.

Table 8 Summary of notifications of domestic support in China, 2002-2008

Year	Unit: million RMB									
	Notifications						Shadow notifications			
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Green box	184,335	207,898	242,332	252,117	257,963	308,493	329,733	359,901	386,473	397,107
Special and Differential Treatment	0	0	0	0	0	0	0	0	0	0
Blue box	0	0	0	0	0	0	0	0	0	0
Final Bound Total AMS	-	-	-	-	-	-	-	-	-	-
Current Total AMS	0	0	0	0	0	0	0	0	0	0
Rice AMS	-67,966	-67,664	-46,971	-17,331	-12,085	2,741				
Total value of rice production	235,049	203,015	208,249	191,786	204,359	314,890	296,846	312,790	340,211	395,070
Ratio of rice AMS in rice production value (%)										
Product-specific AMS <i>de minimis</i>	-116,138	-93,656	-76,076	-38,772	-27,309	4,195	-	-	-	-
Non-product-specific AMS <i>de minimis</i>	700	745	748	235	1,283	1,975	6,358	9,338	13,715	9,776
Amber Box	-115,438	-92,911	-75,328	-38,537	-26,026	6,170				

Source: WTO (2010a) and Cheng (2011).

## 5. Comparison

The magnitude of domestic support for agriculture reflects government attitudes towards the protection of the sector and farmers' incomes. Although food security is an important issue in Asian countries it is notable that only Taiwan has not notified payments for public stockholding in the green box. The amber box notification is due to the fact that purchases were not made at market prices. Japan's conversion payments for rice production and Taiwan's set-aside payment are notified in the green

box under “environmental program payments.” Both reduce rice production. In Japan, a direct payment is linked to production limitations, which allows it to be notified in the blue box. Current rice policies in Taiwan and Korea have not been linked to production limitations. Their market price support and direct payments are included in the AMS. In Taiwan, subsidies on fertilizer have been growing due to increasing oil prices. A summary of the main policy measures and their relationship to the AoA boxes is contained in Table 9.

Table 9 Comparison of the structure of WTO domestic support notifications of the four countries

	Japan	Korea	Taiwan	China	
Green box	fixed payments, diversion payment (Environmental programs)	V			
	Public stockholding for food security purposes	V	V	V	
	Set-aside payments (Land conservation payment)	V		V	
Blue box	Variable payment	V			
	Final Bound Total AMS	V	V	V	
Amber Box	Current Total AMS	V	V	V	
	Rice AMS	-	V	V	
	<i>de minimis</i> level	5%	10%	5%	0 8.5%
Product-specific AMS <i>de minimis</i>	Vegetables, fruits, Rice, Chicken eggs	Vegetables, Fruits, Milk,	Vegetables, Table sugarcane, Sweet potato	Cotton, Rice, Corn, Wheat, Soybean	
Non-product-specific AMS <i>de minimis</i>	Agricultural Insurance Scheme	V			
	Livestock insurance program			V	
	Input subsidies		V	V	V
	Loan interest subsidy		V	V	V

Source: Authors’ assessment based on WTO notifications.

## V. Implications of the draft modalities for domestic agricultural support

The DDA modalities follow the basic framework of the AoA, requiring further reductions in the total AMS. However, they also require a reduction in the OTDS (sum of CTAMS, *de minimis*, and blue box payments) as well as the imposition of product-specific AMS limits and product/measure-specific limits on blue box payments. Accordingly, we assess the implications of the proposals for domestic support in the four countries.

### 1. Japan



As one of the developed country members of the WTO, the Base OTDS of 5,448 billion yen for Japan includes 10 per cent of the average total value of agricultural production for a 1995-2000 base period (983 billion yen) and 5 per cent of the production value (492 billion yen - higher than the average blue box payment of 79 billion yen), and the FBTAMS of 3,973 billion yen. The Base OTDS payment is equal to US\$ 66 billion and is subject to a reduction of 80 per cent over five years according to the tiered reduction formula. This would result in a bound OTDS of 1,090 billion yen. In addition, the FBTAMS is equal to US\$ 48 billion, which means that it is subject to a reduction of 70 per cent over five years, yielding a new FBTAMS of 1,192 billion yen.

The Final Bound OTDS is lower than the FBTAMS, so the former is a binding constraint. The CTAMS would be further constrained by the deduction of blue box and *de minimis*. Nevertheless, the effective FBTAMS of 968 billion yen is still far above the CTAMS of 511 billion yen in 2008 (53 per cent of the effective FBTAMS). This suggests that current agricultural policies could remain unchanged under the Doha domestic support modalities.

The uniqueness of Japan's rice policy inclusion in the blue box should be noted. The estimated blue box rice limit is 79 billion yen, which is quite close to the 70 billion yen in the 2006 notification. Japan has transferred payments into "Programs of Direct Payment for Paddy-Field Farming" which focuses on larger farmers instead of all farmers, and adopted a "Cross-Crops Management Stabilization program" to replace crop-specific income assurance. These adjustments caused a decline of blue box payments to 32 billion yen. Although there is no specific Doha requirement to reduce blue box payments (beyond the limits imposed by the total or crop/measure-specific conditions), this suggests that limitations on the blue box are a factor for future rice policy.

## **2. Korea**

As a developing country member of the WTO, Korea can choose base periods of 1995-2000 or 1995-2004 for its support commitments under the proposed modalities. It is also eligible to use 20 per cent rather than 10 per cent of the average total value of agricultural production in calculating the Base OTDS of 11,417 billion won. The modalities require a reduction from the Base OTDS of two-thirds of 55% (37%) over eight years, yielding a Final Bound OTDS of 7,231 billion won which is still much higher than the sum of the CTAMS and *de minimis* in recent notifications. This means that considerable latitude will exist for maintaining distorting support measures. The application of two-thirds of a 45 per cent reduction yields a FBTAMS of 960 billion won. The CTAMS in 2004 was higher than this, but Korea changed its rice policy in 2005, a move which seems to reflect the influence of the domestic support disciplines.

It is estimated that the rice AMS fell to zero in 2008, since the market price plus a fixed payment was greater than the target price.

### **3. Taiwan**

Taiwan is expected to qualify as a recently acceded member (RAM), which can apply the conditions applying to developing countries members in the draft modalities. The average total value of agricultural production in the 1995-2000 base period was NT\$ 295 billion and the Base OTDS is NT\$ 88 billion. After the required reduction, the Final Bound OTDS is NT\$ 56 billion, which is higher than the sum of CTAMS and *de minimis* (NT\$ 12.47 billion) in 2008. This means that current domestic agricultural support policies do not have to change. In addition, the reduced FBTAMS is NT\$ 9.92 billion. The 2008 CTAMS was equal to 40% of this level. The rice AMS limit is NT\$ 4.28 billion which is calculated from the average rice AMS during the base period 2002-2004 as notified to the Committee on Agriculture. The rice AMS of NT\$ 2.77 billion in 2008 was lower than this limit, but if the market price fell the rice AMS could rise. Yang (2007) estimates that the rice AMS would increase by roughly NT\$ 0.46 billion given a market price decrease of NT\$ 1 per kg. In contrast, if market prices increased the rice AMS would be decreased. Government purchased quantities would also decrease, meaning that the government might not be able to acquire sufficient stocks to meet its food security obligations.

### **4. China**

China is a RAM and a developing country member with no scheduled FBTAMS. It will not be required to undertake a reduction commitment in a Base OTDS and will continue to have the same product-specific and non product-specific *de minimis* levels. The estimated Base OTDS of 600 billion RMB is its Final Bound level. Amber box support under *de minimis* was 6.17 billion RMB in 2004. However, the non-product-specific *de minimis* increased rapidly from 1.97 billion RMB in 2004 to 9.78 billion RMB in 2008, reflecting increasing agricultural subsidies with economic growth. The rice AMS limit of 47.28 billion RMB is calculated as twice the *de minimis* level. As noted, the rice AMS was a positive 2.74 billion RMB in 2004, but the minimum procurement price is still slightly below the market price in 2011. China still has considerable room to increase subsidies for rice.

### **5. Comparisons**

The draft modalities would not appear to put much pressure on current domestic agricultural support and rice policies in these four Asian countries. The sum of the CTAMS, *de minimis*, and blue box payments are far below the proposed Final Bound OTDS. The recent CTAMS has been only half of the Final Bound level after reduction under the tiered formula. This seems to imply that there will be little pressure to change the status quo. A summary comparison for the four countries is shown in Table

10.

Table10 Comparison of domestic support in the four countries based on the draft modalities

	Japan	Korea	Taiwan	China
units	Billion Yen	Billion Won	Million NT	Million RMB
Average total value of agricultural production in the 1995-2000 base period	9,833	37,907	295,047	2,150,200
Average total value of agricultural production in the 1995-2004 base period	-	40,183	283,900	2,400,436
(1) Final Bound Total AMS	3,973	1,371	14,165	-
(2) 20% or 10% of the average total value of agricultural production in the base period	983	8,037	59,009	480,087
(3) 5% of the average total value of agricultural production in the base period	492	2,009	14,752	120,022
Average blue box payments in the base period	78.87	0	0	0
Base OTDS=(1)+(2)+(3)	5,448	11,417	87,927	600,109
Reduced Base OTDS	1,090	7,231	55,687	600,109
Reduced Final Bound Total AMS	968	960	9,916	-
Current Total AMS in 2008 <sup>1</sup>	511	88	4,013	0
Rice AMS limits <sup>2</sup>	1,353	1,868	4,283	47,278
Current rice AMS in 2008 <sup>1</sup>	0	0	2,768	2,741
Overall blue box limit <sup>3</sup>	2,428		7,376	53,755
Rice blue box limit <sup>4</sup>	79	1,868	4,283	47,278
Rice current blue box	32.40	0	0	0
Reduced <i>de minimis</i> level	2.5%	6.67%	4.17%	8.5%

Notes:

1. China's current total AMS and rice AMS are in 2004 based on its available notification.
2. Rice AMS limits are calculated by the draft modality, that is, Japan is based on *de minimis* level provided for under Article 6.4 of the Uruguay Round Agreement on Agriculture, Korea and China are based on two times the Member's product-specific *de minimis* level provided for under Article 6.4 of the Uruguay Round Agreement on Agriculture, and Taiwan is based on the average product-specific AMS during the base period notified to the Committee on Agriculture.
3. Overall blue box limit is calculated by 2.5 per cent of the average total value of agricultural production in the 1995-2000 base period on the basis of notifications to the Committee on Agriculture where they exist.
4. Rice blue box limits are calculated by the average value of rice blue box in Japan during the 1995-2000 period and with notifications to the Committee on Agriculture, and one-for-one rice AMS limits transfer in Korea, Taiwan, and China.

Source: Authors' calculations based on the 2008 WTO draft modalities.

However, the draft modalities not only require overall reductions, but also impose product-specific limits. For instance, the blue box limit for rice in Japan is 78.87 billion yen. Japan began to change its rice policy to direct payments instead of market price support from 1998, but the average blue box payment was 76.17 billion yen in 1998-2006. Under pressures for reduction, Japan adjusted farmers' qualifications for direct payments in 2007, thereby cutting the total to 32.4 billion yen in 2008. This seems to suggest an impact of product-specific blue box limits on the rice policy. For the other countries with no current blue box payments, this would

seem to allow for a one for one transfer of product-specific AMS to the blue box, with suitable changes in policy to satisfy blue box conditions. In the Taiwan case, the rice AMS limit is NT\$ 4.28 billion, which would be the rice blue box limit. Beside this opportunity for box shifting, the current rice AMS would still face pressure from the limit when market prices fall because of government purchases at guaranteed prices.

The OTDS defines the maximum allowable level for all kinds of trade-distorting payments or subsidies; however, overall blue box limits, product-specific blue box limits, the FBTAMS, and product-specific AMS substantially restrict domestic support policies. The gradual reduction of the OTDS, general and product or measure-specific bindings on the total AMS or blue box and reductions in *de minimus* imply that the room for maneuver will become smaller. Once a domestic support payment faces one of the general or product-specific limits this is likely to generate pressure for a change in policies.

## **VI. Rice policy reform under the Doha Development Agenda: the case of Taiwan**

Although we have concluded that the draft modalities for domestic support do not require any immediate change in rice policies in the four Asian countries, food security considerations could provide a focus for adjustment, in a situation of rising world food prices.

Japan and Korea terminated their policies of purchasing rice at guaranteed prices, and replaced these by purchases at market prices to establish a public stock-holding system. In contrast, Taiwan continues to rely on a market price support policy. The purchased amount varies with market prices, but the system is not well-suited to stockholding for food security purposes. In addition, there are often political pressures to raise guarantee prices, which is not conducive to meeting WTO commitments or to policy reform. Consequently, we examine alternatives to current rice policy with the aim of achieving food security objectives and satisfying the draft domestic support modalities. Our focus is on the use of direct payments that will meet blue box conditions by being linked to production limitations, or being based on fixed, rather than current, quantities of production.

We divide direct payments into two categories: price-based and revenue-based. The former are based on the difference between a target price and market price, and the latter are based on the difference between a revenue baseline and actual revenue. To meet proposed blue box requirements and food security objectives, we examine three alternatives.

### **1. Price-based direct payment with a fixed purchase amount**

This simplifies the current three-tiered purchase system into a single tier with a maximum purchase level from each farm linked to a target price. The direct payment

is determined as 85 percent of the difference between the target price and the market price times a maximum purchased quantity per hectare. The target price is the same as that under the current tier of “planned purchases,” because the government purchased quantity is mostly derived from that tier. However, since the fill rate is less than 40 per cent of the planned purchase quantity, we reduce the maximum under the proposed program to that defined by the “supplementary purchase” in order to provide a more realistic target. Keeping the planned guaranteed price at the higher level of that under the current government guaranteed price program will help to smooth the change in policy.

Under this alternative, farmers still have right to decide whether or not to sell rice to the government, depending on the difference between the target price and the market price, just as in the current situation. The government acquires rice from farmers at the market price but pays them the difference between the target price and market price times the purchased quantity. The advantage of this is that the direct payment is only made to farmers who choose to sell rice to the government. If farmers have an opportunity to sell rice at a higher price than the target price (e.g., because they market high quality rice), they would not get a direct payment from the government, which is the same as under the current situation. No farmer would have any additional benefit. In addition if the purchased quantity is not sufficient to satisfy the level of stock-holding for food security purposes the government has the option of buying additional rice at market prices.

To provide an additional incentive to participate in the program we propose that a basic payment be provided to farmers to compensate for the reduction in income from the elimination of the current program. This payment would only be made to farmers who decide to sell rice to government, and we set the fixed compensation payment to be equivalent to 15 per cent of average revenue under the existing program in the base period. The percentage could differ according to government preferences on the level of compensation to be provided to participating farmers.

The direct payment per hectare, equal to the sum of variable payment and basic payment, is calculated through the following formula:

$$DP_1 = \max\{(P_T - P) \cdot 85\% \cdot Q_T - BP_1, 0\} + BP_1,$$

where  $DP_1$  is direct payment per hectare;  $P_T$  is target price which is equal to the guaranteed price for “planned purchases”;  $P$  is the market price;  $Q_T$  is the maximum purchased quantity per hectare under the “supplementary purchase”, but is actually based on the quantity sold to government;  $BP_1$  is a fixed basic payment per hectare of  $BP_1 = 15\% \cdot R_B$ , where  $R_B$  is average revenue per hectare under the existing policy in the base period.

Since a basic payment will be paid to farmers who sell rice to the government,

the variable payment is adjusted to avoid double-counting. If the price difference is less than the basic payment, the variable payment is zero. In that case the direct payment will be equal the basic payment. This follows the approach used in Japan and Korea. It means that it is possible that a farmer's income will be higher than under the current policy, but the additional transfer of income does not involve the same level of distortion as the existing policy.

## **2. Price-based direct payment with participation in a set-aside program**

With reference to the Japan's experience, farmers who receive direct payments must participate in a production adjustment program. In Taiwan, the Paddy Field Fallow and Diversion program is independent of government purchases at guaranteed prices. These two programs have resulted in a substitution relationship with competing effects on production. However, this can be transformed into complementary relationship; that is, qualification for the direct payment is applied to those who participate the Paddy Field Fallow and Diversion program. For example, farmers could agree to fallow land or divert this during three years; otherwise, he/she would not qualify for a direct payment. The requirement would also have a balancing effect on production by increasing the utilization of fallow and decreasing the utilization of paddy fields.

The direct payment per hectare under the second alternative is determined by 85 percent of the price difference between a target price and the market price multiplied by production. In addition, the source of stock-holding for food security is government purchases of rice in the market. Since the second alternative applies to total production, the target price would be set a lower level than the first alternative above. Following Japan's experience, we set the target price as a moving average of the market price for the last three years. It will be beneficial to link this to developments in the market. If the market price is close to the target price, farmers' incomes will be lower than under the current situation. To offset this, the alternative also includes a basic payment to compensate for income loss. As above, we consider a basic payment of 15 percent, but in this case it is based on the set-aside payment per hectare. Such a specification maintains a strong complementary relationship between this approach and the existing program of Paddy Field Fallow and Diversion.

The direct payment per hectare, which is equal to the sum of variable payment and the basic payment, is calculated from the following formula:

$$DP_2 = \max\{(P_T - P) \cdot 85\% \cdot Q - BP_2, 0\} + BP_2,$$

where  $DP_2$  is the direct payment per hectare;  $P_T$  is the target price – a moving average of the last three years' market price;  $P$  is market price;  $Q$  is production per hectare;  $BP_2$  is a fixed basic payment per hectare equal to 15 percent of the set-aside payment.

## **3. Revenue-based direct payment with participation in a set-aside program**

Follow the experience of the American Average Crop Revenue Election program (ACRE) and Japan's program of Direct Payment for Paddy-Field Farming, the third alternative is to replace the price difference in the second option above by a revenue stabilizer. This reflects the original purpose of domestic support policy to maintain farmers' income, and overcomes the problem of over-compensation when market prices decrease or under-compensation when they increase. The target revenue is set through a moving average of revenue per hectare for the last three years. The variable payment is 85 percent of the difference between target revenue and actual revenue, adjusted for the fixed basic payment which is assumed to be 15 percent of the existing set-aside payment.

The direct payment per hectare under this option is calculated through the following formula:

$$DP_3 = \max\{(R_T - R) \cdot 85\% - BP_3, 0\} + BP_3,$$

where  $DP_3$  is the direct payment per hectare;  $R_T$  is target revenue per hectare – defined as a moving average of revenue per hectare for the last three years;  $R$  is actual revenue per hectare;  $BP_3$  is the basic fixed payment per hectare equal to 15 percent of the current set-aside payment.

#### **4. Simulation of the policy options using a quantitative model**

As mention above, current rice policies in Taiwan are based on three pillars: government purchase at guaranteed prices, paddy field fallow and diversion programs, and the tariff rate quota system. These features are reflected in an econometric model of the Taiwanese rice market. In this model the market price is endogenously determined by a market-clearing condition, which sets consumption equal to domestic production plus imports and changes in stocks. Policy variables for government purchases under the guaranteed price program and paddy field fallow and diversion programs are incorporated into the estimated supply function; quota and over-quota tariffs based on the TRQ system are variables in the import function; and government purchases are reflected in the stock function. Further details on the model can be found in Yang (2007). The model can reflect farmers' behavior with respect to guaranteed prices, market price, and set-aside payments, and policy effects on market price support and government purchases. Based on the supply responses and policy effects, we can not only examine the impact of policy reforms on production and market price, but also on farmers' income, stock-holding for food security purposes, and government expenditures. The model has been updated using data for 1974 to 2010.

In the current analysis we use 2008-2010 as a base period, and consider the dynamic delay and cumulative effects of policy changes that incorporate a three-year moving average, presenting results for simulations of the three policy alternatives for

the year 2013 (Table 11).

Table 11 Simulation results for direct payments under rice policy reforms in Taiwan

	units	2010	First alternative	Second alternative	Third alternative
Base market price	NT\$/kg		21.59	21.59	21.59
Base production	Paddy rice tones		1,495,452	1,495,452	1,495,452
Base paddy area	Hectare		253,352	253,352	253,352
Target price (Target revenue)	NT\$/kg		23.00	18.89	107,299.96
Market price (Actual revenue)	NT\$/kg	20.77	19.53	18.27	103,780.97
Production	Paddy rice tones	1,451,011	1,327,026	1,024,442	1,024,442
Variable payment	NT\$/ha		5,895	3,107	2,991
Basic payment	NT\$/ha		19,115	13,500	13,500
Direct payment	NT\$/ha		25,010	16,607	16,491
Govn't purchase	Paddy rice tones	191,050	117,213	200,000	200,000
Rice AMS	NT\$ million	2,638	1,650		
Green box payment	NT\$ million		1,617	3,653	3,653
Blue box payment	NT\$ million		516	2,994	2,973
Govn't expenditures	NT\$ million	4,335	4,422	6,648	6,627
Farmer's income	NT\$/ha	132,235	137,713	120,388	120,272

Source: Authors' estimates and COA (2010).

The results indicate that the biggest impact of the policy change is to decrease the market price, through the removal of the existing market price support. Since the first alternative still reserves the tier of planned purchases, it has a smaller impact (-9.5%) on market price than the other alternatives (-15.4%), and a smaller effect on production. The variable payment under the first alternative is more than the other two, due to the higher target price derived from the existing program as discussed above. The basic fixed payment of the first alternative is also higher, because it is based on average revenue in the base period rather than the set-aside payment as in the other alternatives. The target prices, base and percentage of payment could be changed, since these are policy variables to be decided by policy-makers. In our analysis we have simply used some reasonable values for these variables to compare the different alternatives.

In the first alternative, farmers sell 117 thousand tons of paddy rice to the government, which is less than the 200 thousand tons of purchases that have been



made in recent years to meet food security objectives. The difference has to be purchased from the market; the expenditure of NT\$ 1,617 million is notified as a green box payment. For expenditures on paddy rice by the government, we assume this to be notified as AMS because of the purchases at a planned guaranteed price; however the guaranteed price is the sum of a variable payment and the market price. If government purchases for food security purposes are made at the market price and the variable payment is based on the difference between the target price and the market price it would be possible to notify the food security expenditures as green box payments. The basic fixed payment could be notified as blue box, since it is paid using a fixed price and production in the base period, and based on set-aside. The total basic payment of the first alternative is smaller than others, since it only applies to farmers who sell rice to the government, rather than to all farmers and harvested area.

The direct payments, which include the basic payment and the variable payment under the second and third options discussed above are notified as blue box payments, because they have a production-limiting requirement. The spending for stock-holding of 200 thousand tones for food security through purchases at market prices is notified as green box. Such an approach has not been challenged with respect to other notifications (e.g., Japan), even though such purchases may affect market prices.

Compared to current policy in 2010 with government spending of NT\$ 4,335 million on purchasing paddy rice at guaranteed prices, where NT\$ 2,638 million is notified as AMS, the spending of between NT\$ 4,422 million and NT\$ 6,649 million under the three proposed options is higher. Farmers' income from the first alternative is higher than base period by NT\$ 10,275, but the other alternatives are lower than in the base period. Obviously, the first alternative is particularly beneficial to farmers.

While all three policy alternatives have advantages, particularly in terms of transparency and linkage to food security objectives, it might be difficult to generate sufficient support, particularly from farmers, to implement them. Furthermore, although the current policy has some market distorting effects, the AMS is not close to the WTO binding. In the light of these considerations, it is probable that the current rice policy in Taiwan is unlikely to be changed in the short-run.

## **VII. Conclusions**

Rice is a major food staple in the emerging economies of Asia. Asian rice production and trade also represent a large share of the world totals. Governments in the region use a range of policies to ensure that sufficient supplies of this important commodity are available to their people. Japan, Korea, and Taiwan have adopted protective policies for rice. China's rice policy also seems to be evolving from implicit taxation to the subsidization of rice production.

Membership of the WTO and its Agreement on Agriculture has already caused some rice policy changes. In Japan, government purchases of rice under a guaranteed price were replaced by direct payments which include a fixed payment and variable payment, notified as green box and blue box, respectively. Box shifting has also occurred through changes in Korean rice policy as it came close to its Total AMS commitment. A direct payment has been substituted for purchases at a guaranteed price, resulting in a transfer of some payments to the green box. A guaranteed price policy continues to apply in Taiwan. The main reason is that the rice AMS is less than 30 percent of the FBTAMS. China has changed its rice policy by introducing a minimum price procurement policy, which has transformed its AMS from a negative to a positive number, although it remains below the *de minimis* threshold.

The proposed domestic support modalities in the Doha negotiations, while limiting the room for maneuver to some extent in the provision of domestic support for rice, would not seem to require major changes in policies in the short run. However, based on domestic considerations of food security and income stabilization, there may be arguments for policy reform. Using the example of Taiwan we have examined options for the use of direct payments and purchases at market prices to meet food security objectives, rather than the existing policy of guaranteed prices. Price-based or revenue-based direct payment alternatives could be used. This would not only have the advantage of improved targeting to achieve policy objectives but would allow a reallocation of support from the amber box to the blue or green boxes, thereby helping to satisfy future WTO commitments.

## References

- Blandford, David, Ivar Gaasland, Roberto Garcia and Erling Vårdal (2010), “How Effective are WTO Disciplines on Domestic Support and Market Access for Agriculture?” *The World Economy*, 33(11): 1470-1485.
- Cheng, Fuzhi (2011), “China” in *WTO Disciplines on Agricultural Support: Seeking a Fair Basis for Trade*, edited by David Orden, David Blandford, and Tim Josling, Cambridge: Cambridge University Press.
- COA (2010), *Agricultural Statistics Yearbook*, Published by Council of Agriculture, Executive Yuan, Taiwan.
- Godo, Yoshihisa and Daisuke Takahashi (2011), “Japan” in *WTO Disciplines on Agricultural Support: Seeking a Fair Basis for Trade*, edited by David Orden, David Blandford, and Tim Josling, Cambridge: Cambridge University Press.
- Orden, D., D. Blandford and T. Josling (2011), *WTO Disciplines on Domestic Support: Seeking a Fair Basis for Trade*, Cambridge: Cambridge University Press.
- WTO (2008a), “Japan: Notification of Domestic Support Commitments for

1996-2006,” Documents no. G/AG/N/JPN/34, G/AG/N/JPN/34, G/AG/N/JPN/34, G/AG/N/JPN/34, G/AG/N/JPN/47, G/AG/N/JPN/61, G/AG/N/JPN/72, G/AG/N/JPN/98, G/AG/N/JPN/108, G/AG/N/JPN/124, G/AG/N/JPN/129, G/AG/N/JPN/132, G/AG/N/JPN/137.

WTO (2008b), “Korea: Notification of Domestic Support Commitments for 1997-2004,” Documents no. G/AG/N/KOR/18, G/AG/N/KOR/24, G/AG/N/KOR/30, G/AG/N/KOR/31, G/AG/N/KOR/37.

WTO (2008c), “Revised Draft Modalities for Agriculture,” Document no. TN/AG/W4.

WTO (2010a), “China: Notification of Domestic Support Commitments for 1999-2004,” Documents no. G/AG/N/CHN/8, G/AG/N/CHN/17.

WTO (2010b), “the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu: Notification of Domestic Support Commitments for 2002-2007,” Documents no. G/AG/N/TPKM/32, G/AG/N/TPKM/48, G/AG/N/TPKM/61, G/AG/N/TPKM/68, G/AG/N/TPKM/79.

Yang, Min-Hsien (2007), “Policy Orientation and Its implications of Rice Economy in Taiwan: An Econometric Analysis,” *Agricultural Economics* (in Chinese) 80: 63-105.