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Quantitative evaluation of the Japanese rice policy reforms under the WTO agreement on agriculture

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Abstract

This study aims to quantitatively evaluate the rice policy reforms in Japan since 1995. First, I review the development of the Japanese rice policy reforms since the Uruguay Round Agreement on Agriculture and the transition of the representative indices that measure the level of agricultural protection, such as the producer support estimate (PSE) and the aggregate measure of support (AMS). Next, a quantitative evaluation of the volume of transfers facilitated by the rice policies is carried out by employing the standard framework of welfare analysis. The changes in social welfare are simulated when the ex ante and ex post policies related to rice, namely, direct payment per output, purchase of rice by the government, and acreage control, are abolished and when the import tariff on rice is abolished. In addition, I calculate the average transfer efficiency (ATE) of the rice policies during the analysis period and draw the surplus transformation curve (STC) along with the changes in the acreage control rate. It is concluded that acreage control is the most important policy instrument in the current rice policy mix however, it is highly inefficient and imposes a serious burden on consumers and government expenditure.

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1. Introduction

This study aims to quantitatively evaluate the rice policy reforms in Japan since the enforcement of the Staple Food Law in 1995. Rice is the most important crop, accounting for approximately 25% of the Japanese agricultural production. Meanwhile, the rice policy reforms introduced in conformance with the WTO Agreement on Agriculture are functional, starting from the revision of the Staple Food Law in 1995 to the newly introduced "Programs of Direct Payment for Paddy-Field Farming" in 2007. In developed countries, the reduction in domestic support is one of the three "pillars" in the current Doha Round negotiations. Moreover, in the trade liberalization process of farm products, it is important to monitor developed countries such as Japan, which have a high agricultural protection level. In addition, as pointed out by Hart and Beghin (2006), the method of reducing the aggregate measure of support (AMS) by the Japanese government takes advantage of the loophole in the current WTO Agreement on Agriculture. Therefore, the study of the Japanese rice policy reforms, which were introduced to ensure that the policies conformed to the WTO Agreement on Agriculture, provides an insight into the formulation of desirable domestic support rules. Furthermore, the evaluation of the Japanese rice policy that was prevalent before the introduction of the Programs of Direct Payment for Paddy-Field Farming in 2007 offers significant insight into the domestic agricultural policy reforms. For example, the acreage control policy, designed to reduce the produced quantity and maintain the price of rice, is being criticized for its inefficiency and farmers' unwillingness to participate in the program. While some insist on abolishing acreage control and reinforcing the use of abundant rice for feed (Suzuki and Kaiser, 1998), others insist on providing increased direct payment to principal farmers (Yamashita, 2006). However, before discussing such alternative policies, it is necessary to evaluate the effect of the rice policies on producers, consumers, and tax payers since the enforcement of the Staple Food law.

This paper is organized as follows. In Section 2, the development of the Japanese rice policy reforms since the Uruguay Round Agreement on Agriculture is reviewed. The transition of the representative indices that measure the level of agricultural protection, namely, the producer support estimate (PSE) measured by the organization for economic cooperation and development (OECD) and the AMS notified by the Japanese government is also reviewed. In Section 3, a quantitative evaluation of the volume of transfers facilitated by the rice policies is carried out by employing the standard framework of welfare analysis applied by Otsuka and Hayami (1985) and Godo (2002). In order to evaluate the effect of domestic policies, the changes in social welfare are simulated when the ex ante and ex post policies related to rice, namely, direct payment per output, purchase of rice by the government, and acreage control, are abolished In addition, I calculate the average transfer efficiency (ATE) of the rice policies and draw the surplus transformation curve (STC) along with the changes in the acreage control rate, both of which are argued by Gardner (1983). Finally, the findings and the policy implications of this study are discussed.

2. Rice Policy Reforms since 1995

2.1 Rice Policy under the Uruguay Round Agreement on Agriculture

In this section, I explain the rice policy reforms from 1995 to 2006[1].

[Table 1]

Before the enforcement of the Staple Food Law in 1995, the Japanese rice marketing system was based on the Food Control Law, which was enacted in 1942 and which originally placed all

[1] See also Hayami (1988) and Hayami and Godo (1997) for the rice policy under the Food Control System.

food items under strict government control. Although the food control system for all crops, except rice, was abolished, the government system for controlling the distribution of the entire quantity of rice was effective until 1995. This system had become a dead letter in the 1990s; the illegal "free-market rice," which is outside the purview of the orderly marketing system, became prevalent, and the government expenditure to support the price of rice by buying and disposing rice was considerable. The year 1993 was a turning point with respect to rice policies in Japan in that the harvest was exceptionally poor, producing only 74% of the average harvest, and the government was forced to urgently import 2.6 million tons of rice. Furthermore, the Uruguay Round negotiations reached an agreement at the end of 1993, and the government was required to revise the Food Control Law in order to import rice under the minimum access commitment. By exempting rice from tariffication, the Japanese government was imposed greater rice imports with minimum access commitment; the minimum access import quota was 4% of the domestic consumption in 1995 and to be increased gradually up to 8% in 2000, while the quota was 3% and 5% respectively if the tariffication had been implemented.

Finally, the Food Control Law was replaced by the Staple Food Law (the Law for Stabilization of Supply-Demand and Price of Staple Food) in 1995, which came into effect on November 1, 1995[2]. The compulsory system of selling rice to the government was abolished, and the role of the government purchase was limited to maintaining a rotating stock of rice. In addition, the free-market rice was legalized as "nonorderly marketed rice." Rice import with minimum access also began in 1995, with an import of 426,000 tons, which was 4% of the domestic consumption. The import quota was controlled by the Food Agency, the state trading enterprise (STE) of the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan.

However, even after the implementation of the Staple Food Law, the government continued to support the price of rice by purchasing large amounts of rice. The stock of rice purchased by the government amounted to over 3 million tons, partly because of the good harvest from 1994 to 1997. In order to deal with these problems, the New Rice Policies was introduced in 1998. First, acreage control for curbing rice production was reinforced in order to reduce the government stock and maintain the price of rice. Second, as a substitute to the conventional subsidy for voluntarily marketed rice, the Rice Farming Income Stabilization Program (JRIS) compensated for the decrease in the price of voluntarily marketed rice from the average price for three years. As a part of this program, eligible producers had to participate in the acreage control program. Third, the liberalization of distribution system, such as the abolishment of market price control for orderly marketed rice, was implemented.

The Staple Food Law was once again revised in 1999 to tarifficate rice imports. The import quota was converted to the tariff rate quota, while the official control of quota was maintained. The out-of-quota tariff rate of rice was set at 341 yen per kg, which virtually prohibited all rice imports except for the minimum access imports. The volume of the minimum access rice imports was thereby reduced from 8% to 7.6% of the total consumption in 2000.

Subsequently, the Basic Law on Food, Agriculture and Rural Areas was established in 1999, and the Basic Plan in 2000 announced agricultural policies that were more market-oriented and changed the conventional price support for all farmers to income support for principal farmers. Accordingly, on the basis of the Principle and Outline of Rice Policy Reform in 2002, the Staple Food Law was revised in 2004. This revision completely liberalized the orderly marketing system and regulated the government purchase of rice through the bidding system. In addition, the Income Stabilization Program for Principal Farmers, which produced additional payments for principal rice farmers with large farms, was introduced along with the

[2] In the Japanese rice system, the rice year begins from November in the previous year and ends in October in the subsequent year. Therefore, the Staple Food Law came into effect in the 1996 rice year. Note that the rice available in the market in the 1996 rice year was mainly produced in the 1995 rice year.

conventional JRIS. In 2007, a new income stabilization program called the Programs of Direct Payment for Paddy-Field Farming was introduced, but the measures of income stabilization are the same as the conventional rice policies.

The key statistics of the rice economy in Japan in this period are summarized in Table 1. The considerable decline of rice price, i.e., from 285 yen per kg in 1995 to 216 yen in 2006, is observed. Accordingly, the quantity of rice produced decreased from 10.72 billion tons in 1995 to 8.55 billion tons in 2006. The amount of payment per output is the average of subsidy for total production, including the free market rice that is not covered by direct payment programs. The declining amount of subsidy indicates both the reduction in the government expenditure for the program and the decrease of the former orderly marketed rice. Instead of providing more direct payment, the government made efforts to maintain the price of rice by raising the acreage control rate and providing more subsidies for acreage control. In 2006, only 70% of the paddy field was cultivated for rice production, and the remaining 30% of the land was used for the production of diverted crops, such as wheat and soybeans, or in land improvement programs. The stock of domestic rice has been significantly reduced since the enforcement of the New Rice Policies in 1998. In contrast, the stock of imported rice was been accumulated up to 1,890 thousand tons in 2006. Most of the minimum access rice imports were sold for non-edible use, such as feed, processing use and food aid. The government's ability to purchase and dispose domestic rice is considered to be limited by the stock of imported rice and the financial burden of disposing the stock.

2.2 Rice Policy Reforms and Agricultural Protection Rate

Next, the influence of the rice policy reforms on the indices for the level of agricultural protection, such as the PSE measured by OECD and the AMS notified by the Japanese government is discussed[3].

[Table 2]

Table 2 summarizes the trend of PSE in Japanese agriculture since 1986 and the PSE related to rice. Some payments, such as the payment for the diversion program and the direct payment for principal farmers, are reported as being unrelated to rice, but are still included in Table 2 because they are apparently related to rice production.

The total PSE measured by the farm gate price decreased by more than 40% from 7,726 billion yen in 1986 to 4,149 billion yen in 2007. The percentage PSE also decreased from 65% in 1986 to 46% in 2007. There are three types of PSE that are related to rice: (A) supports based on commodity outputs, (C) payments for which production is required, and (E) payments for which production is not required. The total amount of the PSE related to rice almost halved from 3,386 billion yen to 1,558 billion yen. This shows that the agricultural policy reforms in Japan resulted in a reduction in the agricultural protection rate.

[Table 3]

Table 3 shows the trend of AMS till 2006 and the overall trade-distorting domestic support (OTDS), that is, the sum of the authorized AMS, de minimis, and Blue Box expenditure, which will become a basis for domestic support reduction.

The total AMS decreased more drastically than PSE, especially since 1998, because the official "administered price" for rice became unreported and the market price support for rice became zero. This reflects the liberalization of the marketing regulation of rice after the implementation of the New Rice Policies. However, the sudden reduction in the market price support for rice in 1998 does not imply that there was a significant decrease in the farmers' income. The liberalization process was functional before 1995 and was completed under the

[3] See also Godo and Takahashi (2008) for the notification of domestic agricultural policies by the Japanese government.

revised Staple Food Law in 2004. Furthermore, the price support of rice through the acreage control program and the intervention of rice market by the government purchase and sale of stock are still in effect. Therefore, the official announcement of Japanese MAFF in the notification documents is a little misleading. Since 1998, the AMS related to rice has been zero, and the OTDS related to rice, including JRIS and other income stabilization programs, only constitutes approximately 10% of the total OTDS. Another problem in the notification of the domestic policy by the Japanese government is that the payments for acreage control are included in the Green Box. Acreage control stimulates the production of diverted crops such as wheat and soybeans; however, the government explains it as "payments for maintaining paddy fields in an environmentally good condition." The rice policy reforms are successful in that they reduced the amount of AMS significantly.

3. Quantitative Evaluation of the Rice Policy Reforms

3.1 Outline of the Evaluation Model

This section evaluates the rice policy reforms described in the previous section by the standard welfare analysis adopted by Otsuka and Hayami (1985), Hayami and Godo (1997), and Godo (2002).

The analytical framework of this paper is based on Otsuka and Hayami (1985). They evaluated the rice policies in Japan from 1965 to 1980 using a partial equilibrium model with constant elasticities. They argued that the motivation of the government in this period was to raise producers' welfare while minimizing the budget costs and that it was not concerned with consumer welfare. They also concluded that acreage control was the second-best policy to reduce social inefficiency under the policy of supporting high prices for rice. Godo (2002) also evaluated the rice policies until 1997 using similar models and decomposed the PSE into effect of domestic policies and border restriction. These models set the producer and consumer prices of rice and the acreage control rate as exogenous variables, and the quantity of the government procurement is endogenously determined.

In this paper, I also assume a supply and demand curve with a constant elasticity and that the market price is determined at the equilibrium in a perfectly competitive market. However, due to the following rice policy reforms, the models used in the previous studies cannot be directly applied in this paper. There are three points that are incorporated into the model. First, the orderly marketing system has been abolished, and the price of rice is determined by the market equilibrium. The government has a smaller effect than before on the supply and demand of rice through acreage control and maintenance of the government stock for food security. Second, the minimum access rice import began in 1995. Third, as a substitute for the support of the market price of rice under the Food Control System, a system of direct payments that enables rice farmers to compensate for the price fluctuation has been introduced. In order to incorporate these changes into the model, the direct payment per output, the acreage control rate, and the quantity of the government procurement are set as exogenous variables and the equilibrium price of rice, as an endogenous variable. The imported quantity is exogenous, because the import is controlled by the government. It is also assumed there is no difference in the quality of rice regardless of when or where it was produced.

The structural equations of the rice market model are as follows.

Demand function: $Q_d = A \cdot p_d^{-\alpha}$ (1)

Supply function: $Q_s = B \cdot (1-\theta) \cdot p_s'^{\beta} = B \cdot (1-\theta) \cdot (p_s + g)^{\beta}$ (2)

Market equilibrium condition: $Q_d + G = Q_s$ (3)

Relationship between consumer and producer price: $p_s + m = p_d$ (4)

In the above equations, the variables represent the following.

p_s: farm gate price of rice

g: average subsidy per unit
p'_s: farm gate price of rice, including subsidy
p_d: retail price of rice
m: distribution margin, defined by the gap between actual farm gate and retail price and assume to be constant in each year
G: net purchase of rice by the government, namely, the purchased quantity of domestic rice less the released quantity of minimum access rice
Q_d, Q_s: supply and demand, respectively
A, B: shift parameter of supply and demand, respectively
θ: rate of acreage control, defined by the ratio of unplanted paddy field to cultivated paddy field
α, β: price elasticities of supply and demand, respectively

As per Suzuki and Kaiser (1998), the elasticities of price are obtained from a survey of related studies. The price elasticity of supply is set as 0.45, following the estimation of Fujiki (2000). This value is greater than 0.18, as in Otsuka and Hayami (1985), and approximately 0.4, as in Godo (2002). I use –0.335 as the price elasticity of demand, following the estimation by Kusakari and Kakino (1998). This price elasticity is slightly greater than –0.2, as in Godo (2002), and –0.12, as in Otsuka and Hayami (1985)[4].

3.2 Scenarios of the Simulation

On the basis of the abovementioned model, the effect of the rice policy reforms is evaluated by analyzing how the changes in each policy affect social welfare. In this model, the government can alter three parameters in the domestic rice policies: the acreage control rate,θ; direct payment per output to producers, g; and volume of net purchase by the government, G. In these three policy variables, acreage control is an ex ante policy that maintains the price of rice, while the direct payment and government's purchase can be regarded as ex post policies that compensate for the price fluctuation. Therefore, I first evaluate the welfare effect of direct payment and the government purchase by the simulation of abolishing these two policies. Next, I simulate the case of abolishing the acreage and compare it with the first case. Following Godo (2002), the decomposition of the current PSE into the domestic policies and the border restriction is made from these simulations. In order to evaluate the effect of gradual policy reforms, simulations are conducted for the whole period under the WTO Agreement on Agriculture, namely from 1995 to 2006.

The details of each simulation are as follows.

(a) Abolition of direct payment and government purchase

In this simulation, the direct payment per output to producers, g, is set as zero. Since the direct payment is based on output, it stimulates farmers' incentives for production. I assume that farmers can expect the amount of payment before production, which is realistic considering the payment stabilizes the price of rice to the level of the average price in the previous years. In addition, I also assume that the function of the government with regard to domestic rice is restricted to maintaining a rotating stock and that it sells all the minimum access rice for edible use, except when there is a demand for its processing use. I estimate the demand of minimum access rice for processing use from the average sales of minimum access rice, as of March 2008. The amount saved in government expenditure by the abolition of government purchase is obtained as the actual expenditure of rice procurement in each year, which is published in the official documents of the Japanese MAFF. The gain from selling minimum access rice is calculated as the farm gate price of rice obtained by the simulation less the assumed price of

[4] The sensitive test of changing the value of elasticities is conducted. The effect of policies is larger for both producers and consumers when I assume smaller supply and demand elasticities. The changes in policy effect are 10–20 % of the original simulations when I set the values of elasticities from half to twice of the assumed ones; the conclusion of the simulations thus remains unchanged by the value of elasticities.

rice for feed, that is, 2,000 yen per 60 kg.

(b) Abolition of acreage control

This scenario supposes that all the three rice policies considered in this article, namely, acreage control, direct payment per output, and government purchase, are abolished. The results are shown in Table 2 as the change from simulation (a). In this case, although the government does not have to grant a subsidy for acreage control, the revenue from selling minimum access rice for edible use decreases due to the decline in the price of rice.

The result of each simulation is obtained as follows. First, the shift parameters of supply and demand are estimated from the actual data and assumed elasticities. These shift parameters reflect the actual fluctuation of supply and demand in each year. Next, after changing the values of exogenous policy variables, a new equilibrium farm gate price is calculated from the market equilibrium condition. Then, the retail price, which is a sum of farm gate price and actual distribution margin, the quantity of supply and demand, and changes of producer and consumer surplus are calculated from the model equations.

3.3 Simulation Results

The simulation results are shown in Table 4.

[Table 4]

First, from simulation (a), it is observed that the effect of the two policies on producer surplus is positive, except for 2003—the year of the bad harvest. The increased amount of producer surplus has, however, declined, especially after 1998, when the New Rice Policies was introduced. The effect of the two policies on consumer surplus is negative in most years, although the amount is not substantial since 1998. This is partly because the effect of direct payment is shifted not only to producers but also to consumers through increased production. The procurement of rice results in smaller gains to the producers each year. In the case of a bad harvest, as in 2003, the government sells a larger amount of rice to the domestic market than that it purchases, thus preventing farmers from taking advantage of the high price of rice. This is because of the accumulated stock of imported rice as well as the constraint on purchasing domestic rice since the implementation of the New Rice Policies.

Next, the simulation results of simulation (b) are examined, in which not only direct payment per output and government purchase but also acreage control is abolished. The farm gate price of rice in simulation (a) is approximately 50–60% higher than that in simulation (b), while the quantity produced is 10–15% smaller. This is the effect of price support by acreage control. The change of producer surplus from simulation (a) to (b) is 600 billion yen, on average. The effect of acreage control to increase producer surplus is much larger than the effect of direct payment and government purchase; it is clear that the most significant transfer is made to producers by the acreage control program. This has especially been the case after 1998, when the New Rice Policies was introduced and the government purchase of rice was restricted. On the other hand, the acreage control policy imposes a serious burden on consumers and increases the government expenditure. The sum of reduced consumer surplus and government expenditure by the acreage control program is about 990 billion yen, on average, which is much larger than the increase in producer surplus.

The estimation of PSE in each simulation is also included in Table 4. Comparing the actual PSE related to rice farming shown in Table 2, the extent of transfers made by import tariff and domestic policies is ascertained. The PSE in simulation (b), in which all the domestic policies related to rice farming are abolished, shows how much transfer is made by import restriction. Approximately half of the PSE is composed of import tariff, while acreage control plays a key role in supporting domestic rice price and thus increasing the PSE related to rice farming.

[Figure 1]

To discuss the effect of domestic rice policies, I plot the change of producer surplus on the vertical line and the sum of the change of consumer surplus and the government expenditure on the horizontal line in Figure 1. The 45-degree line represents efficient transfer to the producer without deadweight loss. The sum of the transfer to producers by these three policies declined from 970 billion yen in 1995–1997 to 760 billion yen in 2004–2006; this is shown by the shift of plots in the bottom right direction. Figure 1 also shows the ATE, which is defined as the ratio of producer surplus change to the sum of changes in consumer surplus and government expenditure, and is calculated as the slope of the line between each point and the original point. Except for 1998 and 2003 (the years of bad harvest), the plots are approximately on the same line. This implies that the ATE remains constant even with the rice policy reforms. The average ATE during the analysis period is 0.62, which implies that 62% of the loss of consumers and government expenditure is transferred to producers and the remaining is forgone as dead weight loss.

In order to further examine the efficiency of the acreage control program, I draw the STC of rice policies along with the changes in the acreage control rate from 0 to 0.5 by 0.05. The average statistics from 2004 to 2006 are used in this simulation. The dotted line represents the STC in Figure 1. As per the numerical example by Gardner (1983), the slope of the STC is less than one and declines as the acreage control rate rises. This implies that the inefficiency of acreage control becomes even more substantial as the policy is reinforced. However, the growing importance of the acreage control policy in the current rice policy mix is shown in Table 4. As argued by Alston and Hurd (1990), efficient redistribution along with the 45-degree line is possible by providing decoupled direct payment or by combining direct payment per output with production quota. Therefore, it could be concluded that the government has arbitrarily chosen to adopt inefficient policy mix by strengthening the acreage control policy. This is justified if the government is indifferent to the changes in consumer welfare and tries to minimize the budgetary cost of protecting the interest of farmers, as indicated by Otsuka and Hayami (1985).

4. Conclusion

The current AMS of the Japanese agricultural policies is well below the commitment level, and the prohibitive tariff rate of rice has been accepted. On the other hand, the market price support through acreage control and procurement continues to exist, although the distribution system has been liberalized. The Japanese government does not have to introduce additional reforms to ensure that the policies conform to the WTO Agreement on Agriculture, and is even able to grant large amount of trade-distorting direct payment to domestic producers. This raises a question against the ability of the WTO rules to control domestic policies, especially by developed countries. The quantitative analysis conducted in this study offers a basis for improving transparency of domestic policies by Japan and negotiating effective disciplines of domestic support, such as redefinition of AMS and Green Box. With regard to domestic policy reforms, this study clearly verified the inefficiency of current policy mix related to rice. The government should not only passively respond to the reforms of the domestic policies following the international negotiations but also ensure positive reforms in order to improve the efficiency of these policies.

In the simulations, it was assumed that the market of rice is homogenous, perfectly competitive and closed economy. However, the assumptions of homogenous good and perfect competition may be oversimplified, considering the quality difference and the market structure of rice. In addition, the assumption of closed economy may become invalid when the prohibitive tariff is controlled by a tariff reduction or the import quota is expanded. It is necessary to modify the evaluation model to account for these limitations.

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Table 1: Key Statistics on the Rice Economy in Japan (source: the MAFF publications)

	Farm Gate Price	Subsidized Farm Gate Price	Retail Price	Distribution Margin	Acreage Control Rate	Subsidy for Acreage Control	Produced Quantity	Consumed Quantity
1995	285	295	433	148	18.2	81	10,720	9,620
1995	286	295	419	133	23.0	133	10,330	9,880
1997	256	265	400	143	23.3	133	10,000	9,370
1998	270	270	389	119	28.7	116	8,940	9,240
1999	245	258	370	125	28.7	117	9,160	8,890
2000	232	249	359	127	28.9	136	9,470	9,380
2001	235	245	356	121	31.0	167	9,050	9,270
2002	232	245	363	131	31.3	201	8,880	9,160
2003	304	298	388	84	31.8	186	7,780	8,590
2004	224	228	336	112	29.9	159	8,720	8,470
2005	217	223	332	115	29.2	168	9,060	8,960
2006	216	221	328	112	29.6	165	8,550	8,660
		(yen/kg)			(%)	(billion yen)	(thousand tons)	

	Government Purchase and Sale of Rice (thousand tons)							
	Government Stock of Domestic Rice	Purchase of Domestic Rice	Sale of Domestic Rice for Edible Use	Sale of Domestic Rice for Non-Edible Use	Government Stock of Imported Rice	Imported Quantity of Minimum Access Rice	Sale of Imported Rice for Edible Use	Sale of Imported Rice for Non-Edible Use
1995	1,180	1,650	550	40	0	430	0	120
1996	2,240	1,160	680	50	310	510	30	400
1997	2,670	1,190	520	370	390	600	40	530
1998	2,970	300	500	440	420	680	100	560
1999	2,330	570	200	1,090	440	720	100	350
2000	1,610	410	230	40	560	770	90	490
2001	1,750	80	200	0	750	770	100	470
2002	1,550	140	380	0	950	770	40	410
2003	1,660	20	770	340	1,270	760	60	540
2004	570	370	40	180	1,480	770	80	420
2005	710	390	190	230	1,750	770	100	530
2006	760	250	250	0	1,890	770	110	1,020

Table 2: Trend of the PSE in Japanese Agriculture (source: OECD)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total value of production	11,171	10,356	10,303	10,862	11,339	11,304	11,151	10,366	11,248	10,388	10,243
Producer Support Estimates (PSE)	7,726	7,135	6,845	6,564	6,190	6,159	6,686	6,339	7,415	6,841	6,254
Percentage PSE	64.7	64.4	61.8	56.8	51.6	51.5	56.6	57.6	62.7	62.2	57.9
Value of rice production	3,623	3,109	2,773	2,888	2,887	2,624	2,889	2,140	3,273	2,936	3,047
PSE related to rice farming	3,386	2,921	2,536	2,573	2,553	2,338	2,598	2,038	2,819	2,657	2,613
A. Support based on commodity outputs											
Market Price Support	3,013	2,592	2,204	2,213	2,235	2,025	2,316	1,801	2,650	2,449	2,400
Payments based on output	123	114	114	133	145	141	136	136	94	119	80
C. Payments (production required)											
Area payment	0	0	0	0	0	0	0	0	0	0	0
Rice farmers management support	0	0	0	0	0	0	0	0	0	0	0
E. Payments (production not required)											
Diversion	250	216	218	227	173	172	146	101	75	89	133
Direct payment for core farmers	0	0	0	0	0	0	0	0	0	0	0
Level of production (thousand tons)	11,647	10,627	9,935	10,347	10,499	9,604	10,573	7,834	11,981	10,748	10,344
Producer price (yen/kg)	311	293	279	279	275	273	273	273	273	273	295
Reference price (yen/kg)	52	49	57	65	62	62	54	43	52	45	63

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total value of production	9,746	9,765	9,299	9,130	8,881	8,930	8,857	8,714	8,489	8,310	8,504
Producer Support Estimates (PSE)	5,607	5,991	5,906	5,804	5,376	5,511	5,462	5,191	4,908	4,566	4,149
Percentage PSE	54.2	58.2	60.0	59.4	56.4	57.5	57.5	55.9	54.2	51.5	45.5
Value of rice production	2,629	2,424	2,260	2,140	2,032	1,970	2,087	2,061	1,916	1,783	1,789
PSE related to rice farming	2,240	2,206	2,161	2,093	1,992	1,858	2,028	1,846	1,774	1,569	1,558
A. Support based on commodity outputs											
Market Price Support	1,981	1,990	1,933	1,847	1,727	1,591	1,768	1,624	1,552	1,341	1,265
Payments based on output	126	100	111	118	115	99	81	73	58	66	41
C. Payments (production required)											
Area payment	0	0	0	0	0	0	0	4	4	5	5
Rice farmers management support	0	0	0	0	0	0	0	0	12	8	1
E. Payments (production not required)											
Diversion	133	116	117	129	150	168	179	145	148	150	148
Direct payment for core farmers	0	0	0	0	0	0	0	0	0	0	98
Level of production (thousand tons)	10,025	8,960	9,175	9,490	9,057	8,889	7,792	8,730	9,074	8,556	8,714
Producer price (yen/kg)	262	271	246	226	224	222	268	236	211	208	205
Reference price (yen/kg)	65	48	36	31	34	43	41	50	40	52	60

Table 3: Trend of the AMS and OTDS (billion yen, source: the WTO notification documents)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Green Box	3169.0	2818.1	2651.7	3001.6	2685.9	2595.3	2546.9	2275.2	2086.3	2098.3	1916.3	1802.4
Payments for conversion from rice production	80.7	133.3	132.9	115.6	116.7	136.2	166.7	200.6	185.8	158.8	168.4	164.6
Blue Box	-	-	-	50.2	92.7	92.7	91.1	86.5	68.2	67.8	65.3	70.1
Amber Box	3507.5	3329.7	3170.8	766.5	747.8	708.5	666.7	730.0	641.8	607.8	593.3	571.2
Price support	3271.3	3125.8	2967.9	641.5	619.6	503.9	389.7	404.0	405.6	403.0	394.7	389.9
(rice)	2560.7	2464.5	2315.3	-	-	-	-	-	-	-	-	-
Domestic payment	236.2	203.9	202.9	125.0	128.2	204.6	277.0	326.0	236.2	204.8	198.6	181.4
(rice)	100.8	93.0	82.2	-	-	-	-	-	-	-	-	-
de minimis	36.6	37.3	36.1	75.5	32.6	31.7	32.1	43.6	35.0	41.1	41.3	18.6
(rice)	-	-	-	41.9	-	-	-	-	-	7.5	7.5	2.3
Current total AMS	3507.5	3329.7	3170.8	766.5	747.8	708.5	666.7	730.0	641.8	607.8	593.3	571.2
(Commitment)	4800.6	4635.0	4469.5	4304.0	4138.4	3972.9	3972.9	3972.9	3972.9	3972.9	3972.9	3972.9
Overall Trade-distorting Domestic Support	3544.1	3367.0	3206.9	841.8	780.4	740.2	698.8	773.6	676.8	648.9	634.6	659.9
TDS related to rice	2661.5	2557.5	2397.5	92.1	92.7	92.7	91.1	86.5	68.2	75.3	72.8	72.4
Percentage	75.1	76.0	74.8	10.9	11.9	12.5	13.0	11.2	10.1	11.6	11.5	11.0

Table 4: Results of the Simulations (source: author's calculation)

(a) abolition of direct payment per output and government purchase, compared to the current situation

	Farm Gate Price	Retail Price	Demand	Supply	Changes of Producer Surplus	Changes of Consumer Surplus	Changes of Government Expenditure	Changes of Deadweight Loss	Producer Support Estimates
1995	238	386	9,998	9,728	-587	462	276	152	1,956
1996	260	394	10,089	9,769	-346	254	308	216	2,066
1997	224	367	9,642	9,262	-401	311	280	190	1,607
1998	265	384	9,285	8,855	-51	52	116	117	2,032
1999	225	350	9,060	8,610	-295	182	224	111	1,749
2000	222	349	9,474	8,984	-254	99	237	82	1,851
2001	231	352	9,308	8,818	-122	41	160	78	1,905
2002	232	363	9,158	8,668	-112	-2	200	87	1,843
2003	318	401	8,492	8,002	152	-116	77	113	2,400
2004	199	311	8,691	8,201	-246	213	122	89	1,381
2005	200	315	9,122	8,632	-201	156	126	81	1,550
2006	205	317	8,758	8,268	-134	94	120	81	1,435
	(yen/kg)		(thousand tons)				(billion yen)		

(b) abolition of acreage control, compared to (a)

	Farm Gate Price	Retail Price	Demand	Supply	Changes of Producer Surplus	Changes of Consumer Surplus	Changes of Government Expenditure	Changes of Deadweight Loss	Producer Support Estimates
1995	175	323	10,615	10,345	-430	651	64	284	1,340
1996	176	309	10,943	10,623	-601	890	106	395	1,200
1997	148	292	10,413	10,033	-535	754	104	323	841
1998	160	279	10,330	9,900	-639	1022	71	454	1,107
1999	134	259	10,019	9,569	-567	863	76	372	945
2000	131	258	10,475	9,985	-605	898	92	385	1,004
2001	131	252	10,405	9,915	-672	977	118	422	968
2002	130	261	10,224	9,734	-712	980	151	419	855
2003	186	269	9,706	9,216	-759	1194	122	558	1,333
2004	116	227	9,650	9,160	-554	762	118	326	601
2005	118	232	10,098	9,608	-580	789	128	337	746
2006	120	232	9,724	9,234	-570	784	123	337	633
	(yen/kg)		(thousand tons)				(billion yen)		

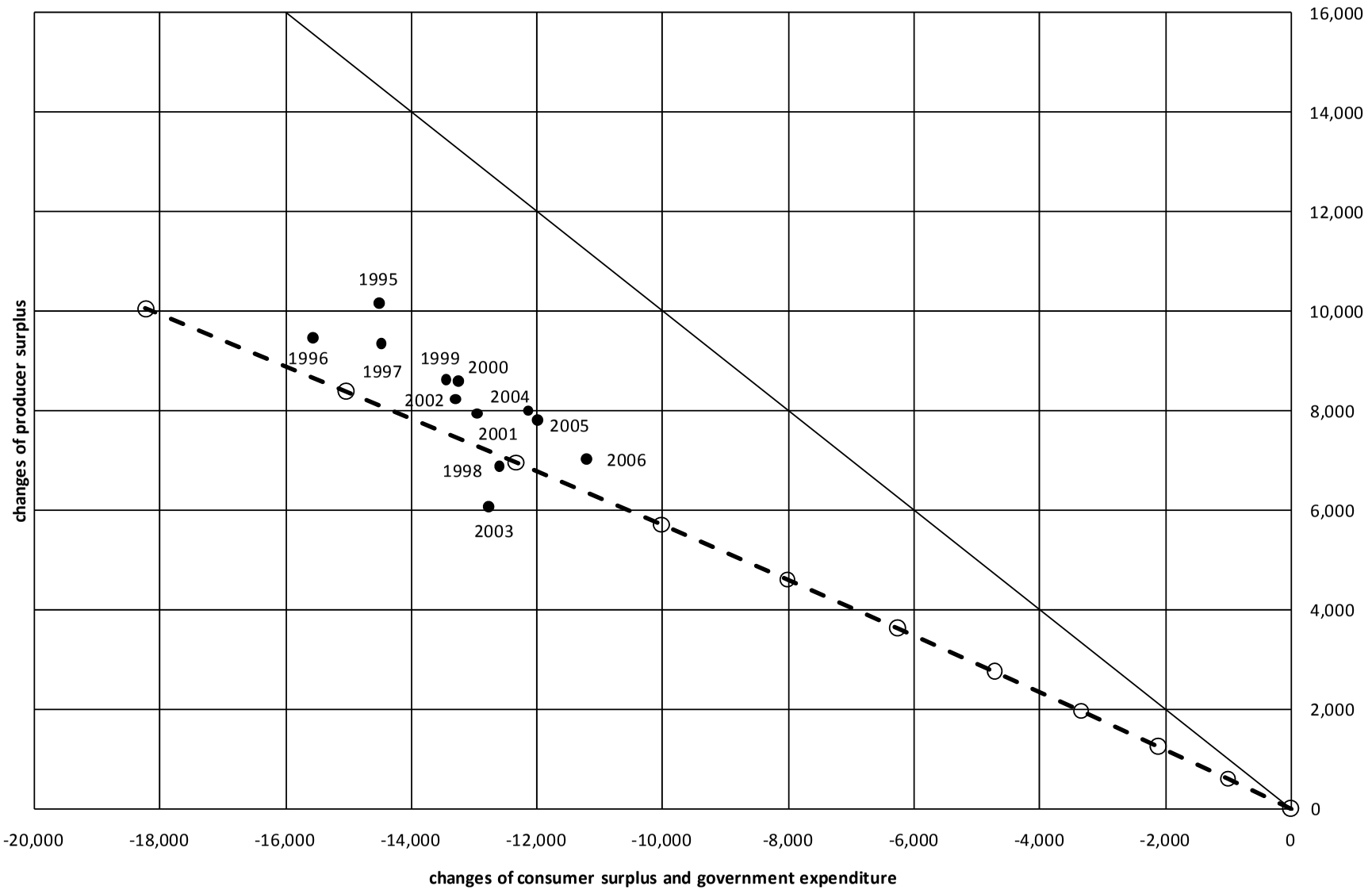

Figure 1: The Surplus Transformation Curve along with the Changes in the Acreage Control Rate (billion yen, source: author's calculation)