International Journal of Latest Engineering and Management Research (IJLEMR)
ISSN: 2455-4847
www.ijlemr.com || Volume 03 - Issue 11 || November 2018 || PP. 81-85

The effect of rice policy reforms in Korea between 2005 and 2011

Jongin Kim
[1](*Korea Rural Economic Institute)*

Abstract: In 2005, rice policy reforms were introduced in Korea. This paper aimed to quantify the effect of the Korean rice policy reforms between 2005 and 2011 by means of welfare analysis and the PSE framework suggested by OECD. The results clearly indicate that the policy reform, as a whole, generated inefficiency in total welfare, while raising the producer surplus sufficiently. Transfers to agricultural producers were also verified by the increase in the PSE in rice commodity. Unlike the existing literature, this paper also focused on the role of net government purchases. The results indicate that the government continued to support producers' incomes by purchasing excess supply. With regard to each policy, production control is the most efficient in terms of budgetary efficiency, and variable payment is the most efficient in terms of total efficiency.

Keywords: Rice Policy, PSE, Direct Payment, Production Control, Government Purchase

1. INTRODUCTION

Rice continues to be a staple food and the biggest agricultural commodity in Korea, even though its share in the total value of agricultural production declined from 33% in 2000 to 19% in 2011. However, it is difficult to deny that rice farming in Korea faces critical situation, since its profitability has been decreasing steadily owing to increasing production costs. The net profit rate out of total revenue declined from 48% in 2000 to 35% in 2011 and continued to worsen to 28% in 2012.

The Korean government has implemented several policies to deal with this problem. For example, since profitability was assumed to be declining owing to oversupply, the government introduced production control in two periods: 2003~2005 and 2011. The former was the set-aside type control and the latter concerned product diversification, wherein farmlands can be used to grow other crops.

In 2005, additional underlying rice policy reforms were introduced, which included the introduction of a public stockholding program and the expansion of direct payments.

The public stockholding program took over the government purchase program for rice, which was intended to ensure food security. Until 2004, the government supported rice farming through the government purchasing program, which purchased rice at a higher price than the market price. However, changes to the program became inevitable as it was assumed to be trade-distorting according to the criteria of the World Trade Organization (WTO) (WTO, 2007); the volume of rice support accounted for 92% of the total Aggregate Measure of Support (AMS). The volume of rice stock for one year was determined to be 864,000 ton, which was approximately equivalent to 17% of national consumption.

Under the new scheme, the government is supposed to purchase rice and release it at the current market price in order to avoid distorting the market mechanism. In other words, the purpose of the new scheme was to let the market determine the price of rice by the balance of demand and supply. On the contrary, Park et al. (2010) pointed out that the government's intervention by purchasing the excess supply in the rice market has continued owing to external circumstances such as oversupply and price decline, as well as the absence of formal guidelines in cases of oversupply.

Direct payments entail enforcing the Rice Income Deficiency Payment (RIDP) scheme, in order to compensate for a producer's income loss owing to the discontinuation of the government purchase program (Lim, 2007). The RIDP scheme consists of fixed payments and variable payments. It compensates a producer for the 85% gap between the target price and the market price. Producers can receive fixed payments as long as the farmland maintains its designated form and function, which is decoupled from production. However, producers have to engage in production to obtain variable payments.

Numerous studies have explored the effect of production control and rice policy reforms after 2005. Kim et al. (2006) argued that only 47~68% of the set-aside program effect would be pure effect, because much of less-favored land could be in set-aside even without the program.

Lee (2006) claimed that the RIDP scheme has positive effects on production and income stability. On the contrary, Lim (2008) argued that the program merely exerts a marginal influence on production.

Lee and Lee (2011) examined the economic effects of production control, with direct payments already in place. They concluded that the set-aside program under the existing direct payments program could improve total surplus, as well as producer surplus. Lee and Yang (2008) also pointed out that concurrent implementation

of the set-aside program and the RIDP scheme would generate the best result in terms of producer income and budget efficiency.

This paper employs the partial equilibrium model, in order to evaluate the Korean rice policy from 2005 to 2011. In doing so, it aims to quantify the effect of rice policy reforms since 2005 in terms of welfare analysis and Producer Support Estimate (PSE) framework suggested by the Organization for Economic Cooperation and Development (OECD)

This paper contributes to the literature in two ways. First, unlike existing papers, it focuses on the role of government purchase in terms of determining the market price and quantifying its effect. Second, this paper also evaluates the efficiency of the reforms in terms of the Producer Support Estimate (PSE) framework and traditional welfare analysis.

As Oskam and Meester (2006) pointed out, the PSE is one of the best-known and most widely used support measures in agriculture. They also argued that Market Price Support (MPS), one of the main components of the PSE, and producer surplus do not have a clear relationship. Thus, not only do they differ in magnitude, but they could also bear opposing signs in capturing economic efficiency. This paper aims to verify the nature of these magnitudes and the sign differences between producer surplus and the PSE[1]

The introduction of the paper should explain the nature of the problem, previous work, purpose, and the contribution of the paper. The contents of each section may be provided to understand easily about the paper.

2. EVALUATION OF KOREAN RICE POLICY REFORMS

2.1 Structural equations for the rice market

The analytical framework for this paper is based on Takahashi(2012), in which government policies are classified into three parts: acreage control, payment per output to producers, and net purchase of rice. Following Takahashi(2012), the supply and demand function changes with a constant elasticity with respect to the price, and the abovementioned three policies are incorporated in the model. Only the equation regarding variable payment is additionally specified in order to reflect the new direct payment scheme employed from 2005.

Demand: $Q_d = A \cdot P_d^{\alpha}$ (1)

Supply: $Q_s = B \cdot (1-\theta) \cdot \hat{P}_s^{\beta}$ (2)

Consumer price: $P_d = P_s + m$ (3)

Producer price with variable payment: $\hat{P}_s = P_s + g_v$ (4)

where $g_v = \{\phi \cdot (p_t - p_s) - g_f\}$[2] (5)

Market clearing condition: $Q_d + G = Q_s$ (6)

A and *B* are the shift parameters of supply and demand[3], θ is the rate of production control, *m* is thedistribution margin[4], ϕ is the rate of compensation between the target price and the producer price, g_f and $g_v$are the fixed payment and the variable payment respectively, and *G* refers to net government purchase.

Therefore, the government influences the rice market with three policy variables: production control (θ), variable payment (ϕ), and net government purchase (*G*).

Regarding (4), the producer responds to the price, including the variable payment, when they decide the quantity of production. The fixed payment is excluded in this case, as the payment is a decoupled payment. The price elasticity of supply and demand is obtained from related studies.

Following Lee and Lee (2011), this paper sets the price elasticity of supply as 0.2 and that of demand as -0.3. This is acceptable since the price elasticity of supply ranges from 0.2 in Kim and An (2006) to 0.3 in Roh and Lim (2005), and the price elasticity of demand ranges from -0.2~-0.35 in Roh and Lim (2005).

[1] More precisely, OECD (2010) referred to the PSE for one commodity as the Producer Single Commodity Transfer (PSCT).

[2] Since the variable payment is the actual value, it must be above zero and can be expressed like the next inequality, $g_v = \{\phi \cdot (g_t - p_s) - g_f\} \geq 0$

[3] They are calibrated from the actual data.

[4] It is assumed to be constant in each year.

2.2 Evaluation procedure

According to the above-mentioned evaluation model, the effect of the rice policy is evaluated by investigating how the changes in each policy affect in the economic surplus.

First, the actual producer price, the producer price with variable payment, and the simulated producer price without government intervention are compared.

Second, the whole effects of the rice policy reforms are evaluated by comparing the change in economic surplus between the actual value and the simulated value, when all the policies are abolished. This is called the benchmark condition.

Third, the effect of each policy is evaluated by comparing the change in economic surplus between the benchmark value, which assumes no intervention from the government, and the simulated value when each policy is introduced.

Fourth, it is possible to gain the new market equilibrium in price and quantity after implementing the first step. By employing this new value, this paper calculates the new Producer Single Commodity Transfer (PSCT) and the change in PSCT for each case. According to OECD (2010), the PSCT is calculated as follows.

$$PSCT_i = MPS_i + \sum BOT_i \tag{7}$$

$$MPS_i = (P_s - BP) \cdot Q_s \tag{8}$$

$$\sum BOT_i = g_v \cdot Q_s \tag{9}$$

Where *MPS* is the Market Price Support, *BOT* refers to Budgetary and Other Transfers to producers from policies, *BP* is the Border Price, and g_v is the variable payment. (9) specifically incorporates the Korean case.

Last, the effect of each policy variable is evaluated in terms of "total efficiency" and "budget efficiency," which can be calculated using the changes in the economics surplus.

The dataset is summarized in Table 1According to the above-mentioned evaluation model, the effect of the rice policy is evaluated by investigating how the changes in each policy affect in the economic surplus.

Table1. Dataset for Korean rice industry

year	Production control	Variable payment	Net government purchase	Qs	Qd	Pd	Ps	Margin
2005	2.4	14,072	417	4,865	4,448	187,237	140,028	47,209
2006	0.0	7,538	184	4,640	4,456	176,712	147,715	28,997
2007	0.0	4,907	105	4,554	4,449	177,295	150,810	26,485
2008	0.0	0	83	4,289	4,206	187,246	162,307	24,939
2009	0.0	12,090	12	4,712	4,700	174,948	142,360	32,588
2010	0.0	15,599	351	4,787	4,436	164,753	138,231	26,522
2011	1.2	0	-385	4,180	4,565	183,154	166,308	16,846
	%	won/80kg	000ton			won/80kg		

Notes: Most of the data was collected from the statistical yearbook of Korean MAFRA (Ministry of Agriculture, Food and Rural Affairs). The data of Margin was obtained from Korea Agro-Fisheries& Food Trade Corp. Net government purchase is calculated by using the Government purchasing of rice,and Government grain release for price stabilization.

2.3 Evaluation results

Figure1 shows the comparison between the actual producer price and the simulated producer price without any government policy. By observing this, we can investigate whole effect of the rice policy on the producer price. Overall, with the exception of 2011, the producer price has been supported by government policies. This can be attributed to stopping large government rice stock releases, which would cause sharp increases in the producer price. This relation could not be relaxed since it is assumed that variable payments are also abolished.

Figure1. Results of simulation for producer price (unit: won/80 kg)

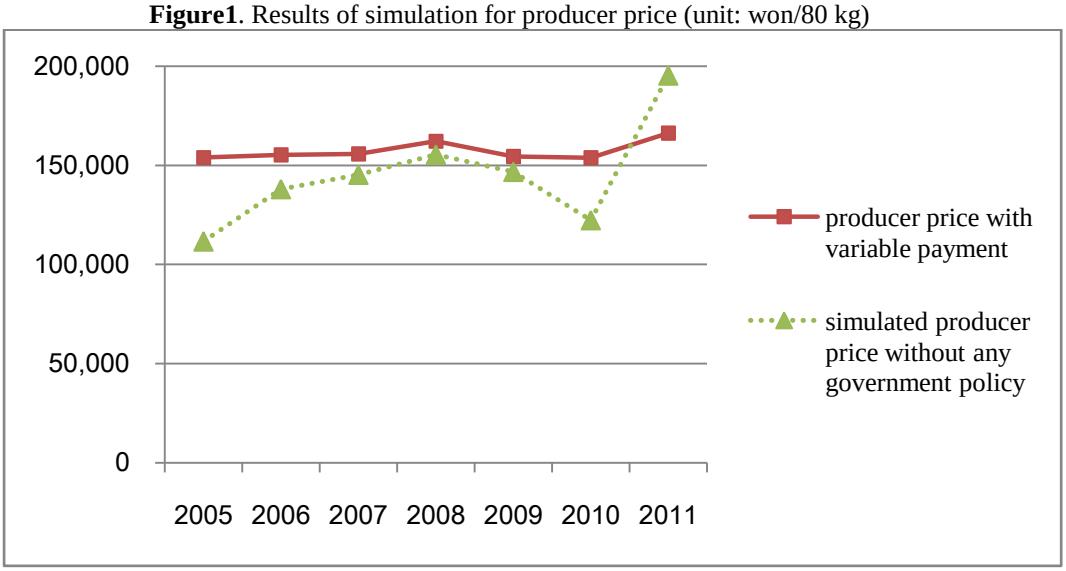

Table2 shows the aggregated evaluation results throughout the whole period. We can recognize the whole effect of the policy mix by interpreting the results of the benchmark. These results indicate that current policy mix raises the producer surplus in conjunction with an increase in government expenditure and a decrease in consumer surplus. As a whole, 280 billion won of total surplus is lost through the policy mix. Moreover, the policy mix raises the PSCT by 643 billion won. Introducing all the policies always entails an increase in the PSCT. In this evaluation, the PSCT and producer surplus show the same direction of change, and their magnitudes are similar.

Consistent with Lee and Lee (2011), the results indicate that production control raises the producer surplus. Instead, government expenditure increases whereas consumer surplus is lowered, thus generating a slight decrease in the total surplus. This is the most efficient budgetary scenario.

The net government purchase shows the exact same direction of effect as production control. However, total efficiency and budgetary efficiency are considerably lower than production control.

Variable payments raise the producer surplus as well as the consumer surplus. This might be partly attributed to increased production, which lowers the market price. Even though it accompanies a huge increase in government expenditure, as a whole, it generates a total surplus gain owing to increase in consumer surplus. Since variable payments show a gain in the total surplus, this policy is the most effective in terms of total efficiency. On the other hand, its budgetary efficiency is the lowest compared to that of the other policies.

Table 2: Aggregated evaluation results (2005~2011)

	ΔPS	ΔCS	ΔE	ΔTS	$\Delta PSCT$	Total Efficiency	Budgetary Efficiency	ΔQ_s	ΔQ_d
Production control	376	-329	65	-18	279	0.05	0.17	-13	-13
Net government purchase	390	-360	180	-151	408	0.39	0.46	30	-56
Variable payment	761	565	1,284	42	453	-0.05	1.69	66	90
Benchmark	-748	263	-765	280	-643	0.37	1.02	-68	42

Notes: PS is the Producer Surplus, CS is the Consumer Surplus, E is Government Expenditure, TS is the Total Surplus, and PSCT is the Producer Single Commodity Transfer. The units for PS, CS, E, TS, and PSCT are billion won. $Q_s$andQ_d are expressed in terms of 1,000 ton. Total Efficiency is defined as -ΔTS/ΔPS, and Budgetary Efficiency, as ΔE/ΔPS.

3. CONCLUSION

This paper aimed to quantify the effect of the Korean rice policy reforms between 2005 and 2011 by means of traditional welfare analysis and the PSE framework suggested by OECD.

With regard to policy intervention, the results clearly indicate that the reform policies, as a whole, generated inefficiency in total welfare, while raising the producer surplus sufficiently. Transfers to agricultural producers were also verified by the increase in the PSCT.

Unlike the existing literature, this paper also focused on the role of net government purchases. Even though the government purchase program for rice was abolished since 2005, the results indicate that the government continued to support producers' incomes by purchasing excess supply.

With regard to each policy, production control is the most efficient in terms of budgetary efficiency, and variable payment is the most efficient in terms of total efficiency.

REFERENCES

[1]. WTO, Domestic support notification G/AG/N/KOR/37(WTO, 2007).
[2]. D. Park, D, Sung, M., Y. Kim, M. Park, M.Sakong, J. Lee,The evaluation and tasks of the rice policy reform, *Korea Rural Economic Institute (KREI) Discussing paper*, 2010.
[3]. S. Lim, Decoupled Payments and Agricultural Policy Reform in Korea,2007 Annual Meeting, July 29-August 1, 2007, Portland, Oregon TN 9755, American Agricultural Economics Association.
[4]. H.Kim, M. Kim, Y. Sakong, Evaluation of Set-Aside Program for Rice in Korea, *Korean Journal of Agricultural Economics, 47(3)*, 2006, 95-116
[5]. Y. Lee,Production and Income Effects of Direct Payments Program for Rice Industry, *Korean Journal of Agricultural Economics 47(2)*, 2006, 51-67.
[6]. Lim, S. Transition to decoupled rice support and its production effects in Korea, *Journal of Rural Development 31(2)*, 2008, 169~185.
[7]. Y. Lee, D. Lee, Effects of the Rice Production Control under the Direct Payments Program, *Korean Journal of Agricultural Economics 52(1)*, 2011, 1-27.
[8]. C. Lee, S. Yang, The Effects of Rice Income Direct Payment Program by Scenario, *Korean Journal of Agricultural Economics, 49(3)*, 2008, 29-52
[9]. OECD, OECD's Producer Support Estimate and related indicators of agricultural support (OECD, 2010).
[10]. A. Oskam, G. Meester, How useful is the PSE in determining agricultural support,*Food Policy 31*, 2006, 123-141
[11]. D. Takahashi, The distributional effect of the rice policy in Japan, 1986-2010, *Food Policy 37*, 2012, 679-689
[12]. J. Roh, S. Lim, Is rice becoming an inferior good?– revisited, *Korean Journal of Agricultural Economics 46(1)*, 2005, 101-121