

RESEARCH INTEREST

TRANSITION TO DECOUPLED RICE SUPPORT
AND ITS PRODUCTION EFFECTS IN KOREA*

LIM SONG-SOO**

Keywords

rice, decoupled support, direct payments, agricultural policy reform, Korea

Abstract

Abolishing a nearly 50-year-old policy for rice price support, Korea adopted a new direct payment program in 2005. Making the transition to decoupled income support has been governed by the need for operative and effective income safety nets and the WTO disciplines on domestic support. The program aims to deal with over-supply of rice while guarding against the threat of income insecurity. Integrated into a target price mechanism, the fixed and variable payments compensate part of farm income loss arising from adverse market conditions. An empirical estimation based on the farm-level data is performed to test the degree of a linkage between rice support and production. The analysis suggests that rice support have only marginal influence on production with the elasticity of 0.03. To secure a smooth implementation of structural reforms and meet the WTO disciplines, Korea may continue to transfer its support into a decoupled, Green Box type measure.

* An original version of this paper was prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, Oregon, July 29-August 1, 2007.

** Korea University, songsoo@korea.ac.kr

1 . Introduction

Since the 1980s, almost all developed and developing countries have carried out agricultural policy reforms (FAO 2005). Increasing pressure on government policies arises from the common observation that agricultural support causes surplus production that needs high budgetary costs and sometimes trade distortions. In this sense, the main debate on agricultural policy reform at the national and international levels centers on whether agricultural support is forged to have a minimal bearing on trade or production.

The Uruguay Round Agreement on Agriculture (URAA) in 1994 recognized the reform process as substantial reductions in support and protection (Article 20), and set up specific rules on policy instruments. The URAA's disciplines on domestic support depend on to what extent it spawns market and trade distortions. The Amber Box refers to most trade distorting subsidies that countries have to reduce. Output payments linked to production-limiting programs are classified as the Blue Box. The Blue Box payments are without limit. Finally, the Green Box includes fixed direct payments having no, or at most minimal, effects on trade and production. The Green Box payments can be increased without limit.

The reform process embodying a shift from more distorting to less distorting support, or transition from the Amber Box to the Green Box, equals to decoupling. Decoupling is to break the link between policy measures and trade or production. OECD (2005a) defines a decoupled measure as such would neither have any current condition associated with production or production factors nor create any expectation that a farmer's production decision today could have influence on tomorrow's payments. OECD (2005b) clarifies its definition of a decoupled measure as ex post empirical in contrast to the URAA's legal definition.

The URAA has contributed to policy reforms in many countries. For example, flooding out large farm outlays and resulting imbalance in certain commodity markets, the European Union's Common Agricultural Policy (CAP) reforms were agreed to rein in over-production and prepare trade liberalization. The 1992 CAP reform introduced compensatory direct payments against decreases in intervention prices, a first stepping-stone on the path to decoupled support from particular crops. The following reforms through Agenda 2000 and 2003 Mid-Term Review expanded and perpetuated the decoupling process. A

highlight of the 2003 reform was to invent the Single Farm Payments (SFPs) delinking support from crops and prices while linking it to wanted standards for environment, food safety and animal welfare.

As for the United States, the 1996 Farm Bill (FB) made a bold change into a market-oriented support mechanism where farmers could freely decide on what to produce based on market signals. Since the government assigned pre-determined direct payments over the implementation period, Agricultural Marketing Transition Act (AMTA) payments were considered as fully decoupled. However, the 2002 FB is reversed from decoupling by adding Counter-Cyclical Payments (CCPs) that were tied to price. The decoupled AMTA payments were embedded in 'Direct Payments' under the 2002 FB.

Following the suit set up by the European Union and the United States in one sense and taking into account of the development in the WTO rules, Korea has increasingly adopted direct payment mechanisms and the process of decoupling. This article is to review such a policy reform in the country highlighting policy transition to decoupled income support. Detailed discussion addresses the direct payment scheme for rice and its implementation issues. This paper also summarizes the likely impacts of the rice scheme by examining previous empirical studies.

II. Evolution of Rice Support Policies

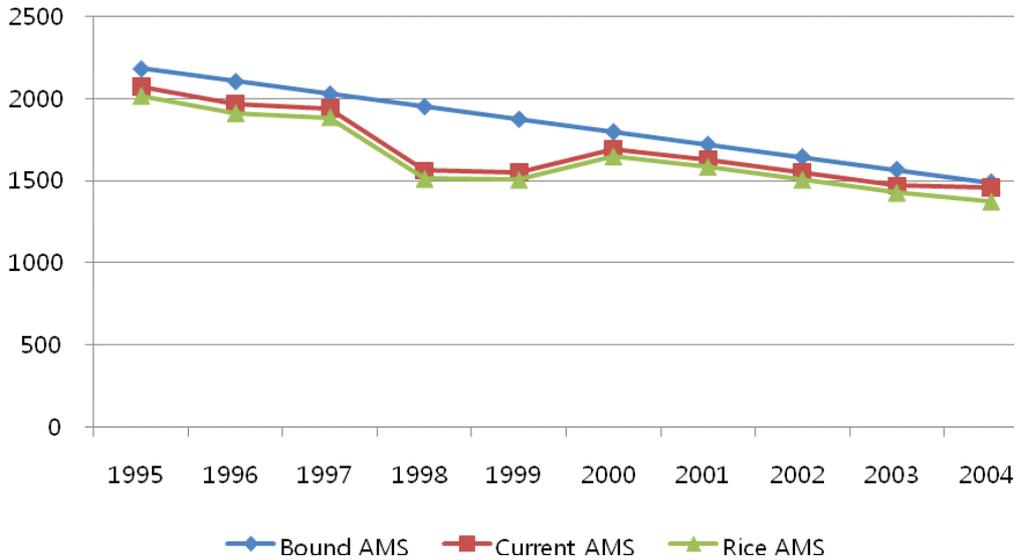
Agricultural policy reform in Korea has been largely driven by external forces including the disciplines on domestic support by the URAA and rapid growth in farm imports spurred by dismantling trade barriers. Korea is one of few countries in the WTO membership which is actually and substantially bound by reduction obligations in the Aggregate Measure of Support (AMS) and thus has had to adjust its rice support system.

As seen in Figure 1, the URAA obligates the country to reduce Amber Box support from 2,183 to 1,490 billion won over the 1995~2004 period. What's required was a gradual cut in support. During the same period, the current total AMS averaged out at 92 percent of the Final Bound Total AMS.

Figure 2 shows that the AMS use ratio, estimated by Current Total AMS over Final Bound Total AMS ranks, is larger than those of major

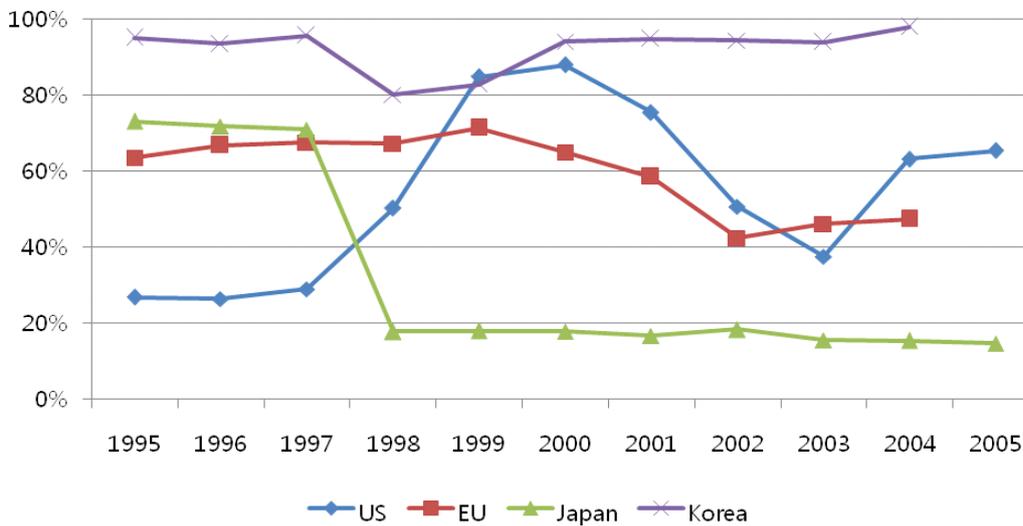
countries. For instance, the European Union records 60 percent in average and the United States and Japan are averaged out at 54 percent and 32 percent, respectively.

FIGURE 1. Final Bound Total and Current AMS for Korea



Source: WTO (2007)

FIGURE 2. Changes in the AMS Use Ratio



Note: Current total AMS figures are estimates for the United States in 2005, and for Japan in 2004~05.

Source: Drawn from WTO (2006; 2007)

The fairly high AMS use ratio suggests that little or no ‘water’ in the AMS made Korea face a real cut in trade distorting support from the beginning of the URAA implementation. An early response from the government was to slim down rice support to comply with the reduction commitment. Because the product specific AMS for rice explained 97 percent of the Current Total AMS, it was unavoidable to reduce the support level.

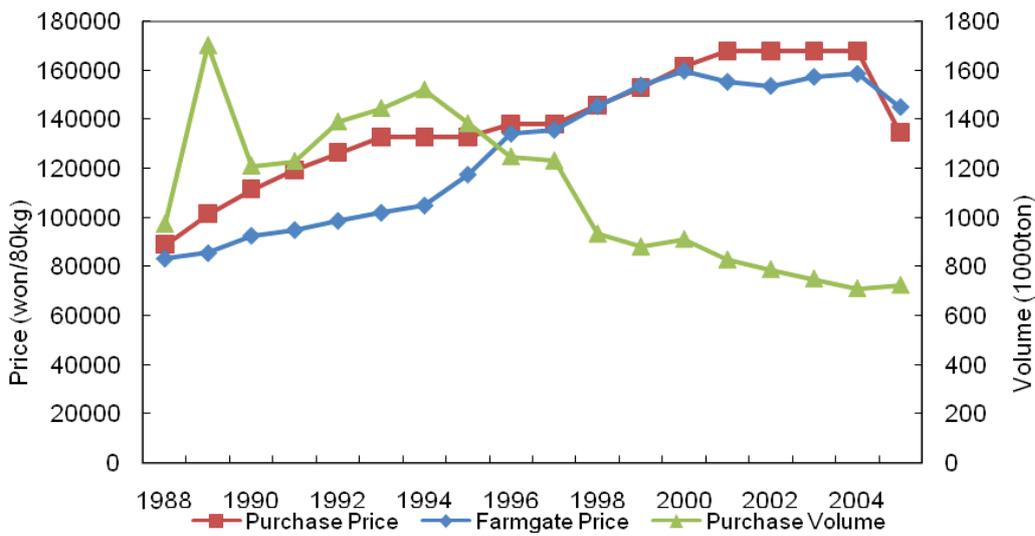
Since introducing the government purchase program in 1961, rice policy has changed a long way. But, the essence of policy variants remains the same as stabilizing farm incomes, ensuring food security and managing the supply and demand of the staple crop. Ahead of the URAA, the long lasting rice policy was reformed in a way to abridge government direct intervention in 1993. This reform made up a curb on an increase in purchasing prices and widening price gaps across seasons.

The government had to meet the declining AMS limit in line with the country schedule under the URAA. As prices were gradually increasing, the amount of purchased rice had to be further reduced. Figure 3 highlights a continual escalation in prices coupled with a sliding down in purchase volumes. Over the 1995~2003 period, the government proposed three times (years) to raise, three times to freeze, and two times to cut the purchase prices. The National Assembly, which had a right to approve government proposals, responded with four times of price freeze and six times of price raise. Because of political pressures and interests, the price rose by 26 percent; but, it was offset by a 48 percent drop in volume in the URAA period. The fact contrasts sharply with the cases of Japan and the Republic of China which have continued to bring down or lock in the prices since 1990 (MAF 2007).

Sumner and Lee (2000) pointed out that dominance of rice in Korean agriculture and its import quota, not the internal support policy, is credited to the large AMS. Rice AMS can be decomposed by an internal gap and an external gap. The internal gap represents a difference between purchase and farm gate prices and the external gap refers to a difference between farm gate and fixed external prices. Figure 4 shows the external gap overwhelms the internal gap. Nonetheless, an early reform in rice support policy would have contributed to an easy and effective reduction in the AMS.¹

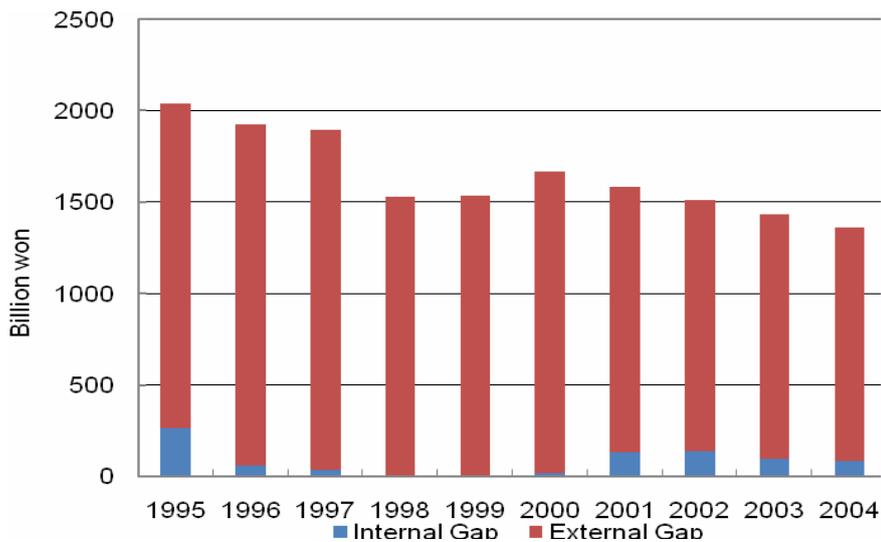
¹ From a political perspective, a substantial cut in rice support price in a short term would have not been feasible because of the likely strong resistance from farm

FIGURE 3. Changes in Rice Prices and Procured Volume



Source: MAF (2007)

FIGURE 4. Decomposition for Rice AMS



Note: These figures do not exactly match the notified AMS because of uniform prices used for different types of rice quality.

Source: Calculated from MAF (2007)

communities. Interestingly enough, farmers wanted to have direct payments in the 1990s while they disliked doing away with the rice purchase program. Research on direct payments under the WTO system began by Lee et al. (1995) followed by a comprehensive study in Suh et al. (1996).

Kim (2003) claimed that government purchasing would not be sustainable because it had poor transfer effects on farm income and a diminishing role as a market price setter. He specifically asserted the direct income support effect of rice purchasing was only less than 9 percent of the government spending or accounted for smaller than 7 percent of the AMS during 1995~2002. In addition, the effectiveness of price and income support were further challenged by a decline in the proportion of purchase quantities in total production from 29 percent in 1995 to 14 percent in 2004.

The first direct payment program for rice farming was the Direct Payment for Rice Paddy Farming (DPRPF) in 2001.² In addition to farm income support, the DPRPF aimed to secure a multifunctional role of paddy fields and promote environment protection and safe food production. The reference area was the farmland used for paddy farming during 1998~2000. Eligible farmers must maintain the shape and role of paddy fields in good agricultural and environmental condition. The payment was subject to cross-compliance including a minimum standard for fertilizer use and pesticide residue. The payment rate was fixed at 0.53 million won per hectare in the Agricultural Promotion Area (APA) and 0.43 million won otherwise.³ A maximum size of the payment area per farm was set at 4 hectares. Most paddy fields were registered for the program and the aids amounted to 481 billion won in 2004.

To address the potential loss of income for rice farmers, the government launched the Income Deficiency Payment for Rice Farming (IDPRF) in 2002 (MAF 2003). Rice farmers kept a wary eye on over-supply, which was

² The first direct payment program in the country is the Direct Payment for Early Retirement introduced in 1997. To facilitate large-scaled farming and provide income safety to retiring farmers, the program aims at 63 to 69-year-old farmers who sell or rent out their paddy fields for at least 5 years. The annual payment rate is about 3 million won per hectare up to 8 years in the case of selling farmland. Farmers renting out farmland receive one-time payment of about 3 million won per hectare. A maximum size of the payment area is 2 hectares.

In 1999, the Direct Payment for Environment-Friendly Farming started out as the second direct program. The aid rate in 2006 for organic paddy farming is 0.39 million won per hectare. About 20,780 hectares of farmland are registered in 2005. A pilot program for environment-friendly livestock farming is also introduced in 2004, aiming for reduction in livestock wastes and stock density rates. Up to 1,000 livestock farms are eligible for the program.

³ The APA is zone-based farmland which has been improved by consolidation and rearrangement.

attributable to an increase in imports under the Minimum Market Access (MMA),⁴ a dwindling volume of government purchase and a downward trend of rice consumption.⁵ To guard against the threat of income insecurity, the IDPRF compensated a part of income loss caused by a price decline. When a post-harvest farmgate price dropped below the reference price, an Olympic average of post-harvest farmgate prices for the previous 5 years, the program provides 80 percent of the gap to farmers. Farmers receiving the aid must deposit 0.5 percent of the reference price. About 16 percent of rice farms joined the program during 2002~2004, but stable post-harvest prices in the period prevented it from triggering the payment.

As specified in the URAA, Korea renegotiated special treatment of rice in 2004 and agreed to increase MMA import from 4 percent in 2005 to nearly 8 percent of domestic consumption (408,700 tons) in 2014. China, the United States, Thailand and Australia obtained country-specific quota for the MMA. The growing concern for rise in import and the need for income safety nets amid AMS constraint and declining consumption contributed to an overhaul of rice policy in 2005.

III. Making the Transition to Decoupled Income Payment

The key principles of rice policy reform in 2005 were targeting and decoupling. First, the reform immediately scrapped the 50-year-old government purchase program. Making transition from price support to decoupled income payment was unavoidable because of a looming WTO discipline for the AMS and deteriorating domestic market situations. Such a policy shift is expected to make room for policy flexibility given the fact that the rice purchase program made up almost all the AMS.

Second, the reform launched the Rice Income Deficiency Payment (RIDP) to provide farmers with 'operative' and 'effective' income safety nets.

⁴ In line with Annex V of the URAA, Korea received special treatment of rice, non-tariffication along with MMA import up to 4 percent of domestic consumption for 10 years.

⁵ Rice consumption per capita was reduced from 107 kilograms in 1995 to 79 kilograms in 2006 (MAF 2007).

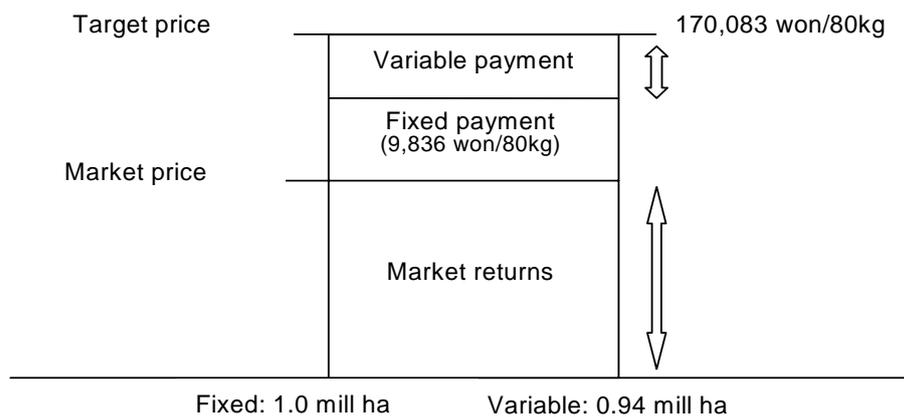
The RIDP consists of fixed payment and variable payment. The fixed payment succeeded the DPRPF as a decoupled measure from production, whereas the variable payment inherited some characteristics of the IDPRF. Thus, the new RIDP is forged as an integrated version of previous support measures. The only difference is that the new program embodies a target price system.

Third, the reform introduced the public stockholding program for rice to ensure food security. It is due to the abolition of the rice purchase program. Under the new scheme, the government obtains and releases rice at current market prices. A target stock is predetermined at 0.87 million tons. The amount is approximately equivalent to a national food need for two months or 17~18 percent of domestic consumption as recommended by the FAO. The Annex V of the URAA recognizes the public stockholding program as a Green Box measure.

Figure 5 explains how the RIDP is structured and operated. For the 2005~2007 years, a target price is 170,083 won per 80 kilograms, accounting for the average harvest price (158,000 won) during 2001~2003, estimated income effects from the DPRPF (9,000 won), and government purchasing of rice (3,000 won).

The target price is subject to change every three years to accommodate the rate of change in average post-harvest prices between the initial period and last three-year period.⁶ It is intended to embody recent changes in the market. But, the National Assembly has a right to approve the proposed target price.

FIGURE 5. Structure of the RIDP in 2005



⁶ The post-harvest season spans from October 1st to January 31st.

The reference area is the paddy fields cultivated with rice, lotus roots, dropwort, or sedges in the 1998~2000 period. Given stricter property right restrictions on the APA, the payment rate for the APA is about 20 percent larger than others. In 2005, the APA represented 69 percent of the registered paddy fields under the fixed payment (MAF 2007).

For the year 2005, the fixed payment rate was 600,000 won per hectare in average or 9,836 won per 80 kilograms of rice. The area size reached about 1 million hectares or about 93 percent of the total paddy fields. Cross compliance applies as follows: First, farmers must maintain and manage the field soil to the extent that crop production is possible. Second, farmers must set up and maintain field boundaries in good condition. Third, farmers must maintain and manage water canals and drains attached to the fields. Finally, farmers must take weed control so as not to disturb neighboring fields.

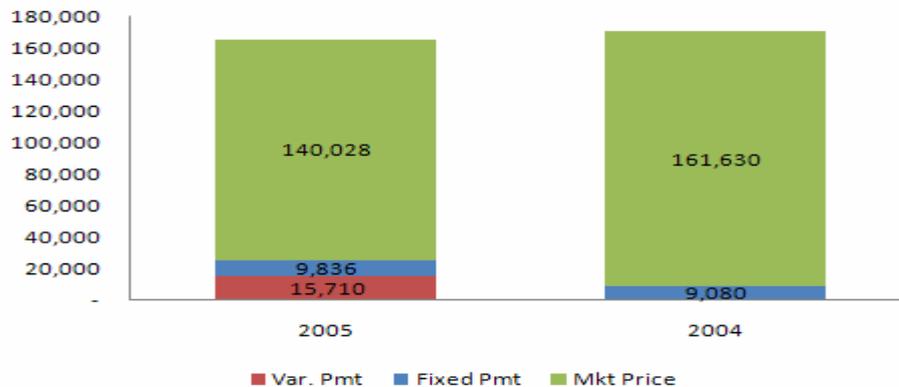
There are extra eligibility criteria for the variable payment. First, farmers must grow rice in standing water of the fields. Second, farmers must meet the standard for pesticide residues. Third, farmers must comply with the recommended use of chemical fertilizers. About 0.94 million hectares joined the variable payment program in 2005. The variable payment equals to the 85 percent of the gap between target and farmgate prices after the fixed payment.

$$\text{Variable payment} = (\text{TP} - \text{post-harvest average price}) * 85/100 - \text{fixed payment}$$

Figure 6 explains how the RIDP functioned to ensure farm income in 2005. An average farmer received 140,028 won per 80 kilograms of rice from the market and 25,546 won as the fixed and variable payment totaling 165,574 won. Thanks to the program, farmers bore only a 3 percent decline in final prices against a 13 percent drop in post-harvest prices during 2004~2005. The RIDP turned out to be effective to attenuate farm income loss against adverse market conditions.

The RIDP is nothing new as other countries maintain comparable mechanisms to protect farm income loss. Figure 7 highlights income support systems for the European Union, Japan, Korea and the United States, simplified for comparison. First, Korea and the United State have much in common with a target price system. But, rice is the only program crop in Korea. Japan puts forward reference production costs as support goals for barley, soybean, sugar

FIGURE 6. Composition of Farm Income during 2004~2005



Note: The fixed payment in 2004 refers to the Direct Payment for Rice Paddy Farming.

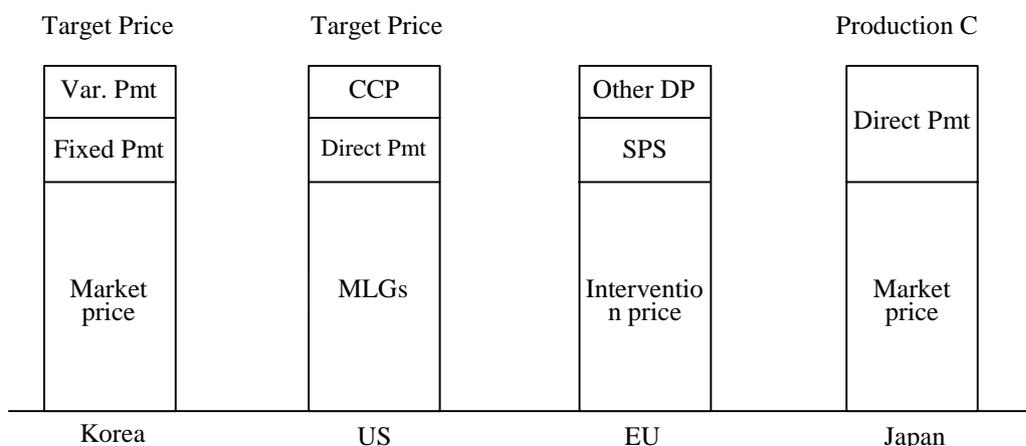
beet and potatoes.⁷ The target prices and reference production costs are all fixed in advance. The United States raised the target prices for the 2004~2007 period for most program commodities. It is not clear if Korea will forge into a cut in the target price in 2007. It is too early to say about Japan's program since it has just launched in 2007. The European Union has designated the target prices for grains as suitable price levels but they are not part of the CAP mechanism (USDA 1999).

Second, an integral part of the income support system is the direct payment in all four countries. While Korea and the United States address farm income through commodity-specific payments, the European Union's Single Payment Scheme (SPS) deals with whole farm income. Japan's CSCMSP based upon a gap between production conditions is more or less similar to the whole farm approach.

The variable payment is also a common feature. The CCPs in the United States incorporate the difference between the target price and the effective price which is the sum of direct payments and the higher of the average market price or the loan rate. Similarly, Korea's variable payment deals with the gap between the target price and the sum of the market price and fixed payment. The European Union maintains some product-specific direct aids coupled with production.

⁷ This new support system is called as the Cross-Sectional Commodity Management Stabilization Program (CSCMSP).

FIGURE 7. Comparison of Farm Income Support Mechanisms



Note: Support mechanisms are simplified for comparison. Also, note that program commodities are not identical.

Finally, the European Union and the United States maintain price support measures with intervention price and loan rate, respectively. As a safety net, they provide floor prices for certain commodities. Since the 1992 CAP reform, intervention prices have been cut and have been partly replaced with the direct payment. The 2002 Farm Bill in the United States authorizes the reduction of loan rates for many program commodities over the 2004~2007 period.

IV. Production Effects of Rice Support

1. Data Characteristics

As is often the case in other countries, the lack of accurate data has deterred estimations of the impacts from decoupled income support. The best alternative data would be the Farm Household Economy Survey Report (FHESR) by the Korea National Statistics Office which provides yearly statistical information on 3,200 sample farm households. It has a single data entry for public subsidy encompassing all the government support. More specifically, the subsidy data include not only direct payments but other subsidies such as support for needy

households, educational aids and transportation subsidies for the elderly.

The aggregated nature of the data does not reveal the accurate amount of rice support, but the data could be quite useful to attest to potential ripple effects of rice support on production. Thus, a balanced panel data set over the 1998-2002 period is constructed with 2,348 households, of which 1,280 households have rice revenues accounting for more than 60 percent of total revenues.

Table 1 shows statistical summary of the data set. The average size of paddy field per farm is 9,048 m² and the paddy field represents about 60 percent of arable land. The government support amounts to 671,773 won and it turns out to vary quite large across sample farms.

TABLE 1. Statistical Summary of Samples

	Paddy field (m ²)	Arable land (m ²)	Public subsidy (won)	Farmer's age
Average	9,048	15,170	671,773	58
Standard deviation	11,187	13,481	2,812,464	11

Source: The Korea National Statistics Office

2. Model Specifications

Equation (1) is proposed to examine a relationship between production and public subsidies, mostly rice support.

$$(1) \quad AP = f(AP-i, PMT, AGE)$$

where AP is the size of rice fields, AP-i is a lagged term of AP, PMT represents public subsidies and AGE is farmer's age.

The dependent variable becomes the size of rice fields because the data set does not have individual farm's production information. If government subsidies stimulate larger production, the coefficient of PMT will be significant and positive. The sign of AGE coefficient may not be determinant. The aging farmers would not keep expanding their farm sizes and so would do young farmers who are in the 20s and 30s.

3. Estimated Results and Implications

Equation (2) shows the estimated results in a double log specification.

$$(2) \log AP = -0.06 + 1.12 * \log(AP-1) - 0.15 * \log(AP-2) + 0.03 * \log(PMT)$$

$$(-0.66) \quad (13.59)** \quad (-1.87)* \quad (2.93)***$$

Adjusted R² = 0.92, Log likelihood = -4.72, F-stat = 2,849.75

The levels of statistical significance are indicated by *** (1 percent), ** (5 percent) and * (10 percent). Standard errors are corrected in the presence of heteroskedasticity. The coefficient of public subsidies is statistically significant at the 1 percent level and the one and two-period lagged terms of rice fields are also significant at 5 percent and 10 percent, respectively. The elasticity of public subsidies appears to be only marginal at 0.03.

Such a low elasticity of public subsidies can be explained by two factors. First, the comprehensive nature of data contributes to a weak linkage between rice production and government support. Inclusion of all subsidies in data might have diluted the degree of its overall effect on production. Second, the low elasticity could reflect the nature of paddy fields which tend to show fixity in use over time with physical and cultural characteristics and significance. Despite data limitations, the empirical estimate casts light on the fact that rice support is largely decoupled from production.

This finding is compatible with previous studies. Using the OECD's Policy Evaluation Matrix model, Seong et al. (2003) finds that an increase in direct payment for rice by 5 percent does not influence the supply and demand for rice. Kim and Kim (2003) reports that direct payments for rice have a marginal production effect, increasing average area per farm from 0.96 ha to 1.00 ha.⁸

⁸ There are other studies which find some production effects of rice support. For example, Sakong (2007) concludes that the fixed payment of the RIDP has no effect on production. But, its variable payments tend to show some production effects. Adopting a similar utility function with uncertainty, Lee (2006) suggests that the present form of the RIDP has a production effect.

V. Conclusion

Transition to decoupled income support is regarded as a significant policy reform in line with greening support and the WTO rules. The empirical estimation indicates that rice support by and large has little production effect. But it needs more robust analyses with appropriate farm level data on direct payments and management decision. If it passes such a decoupling test, direct payments for rice can be safely claimed as a Green Box measure under the WTO classification.

Ensuring continuity of the RIDP depends on changes in market conditions and upcoming WTO rules on domestic support. As by law enacted, a new target price for the 2008~2010 will be based on 2004~2006 average prices. As of the beginning of 2008, it is uncertain if the National Assembly will approve a 5.2 percent drop of the target price, 161,265 won per 80 kilograms of rice. Farmers and farm community are asking to keep the target price as it is.

To meet the AMS reduction discipline setting by the Doha Development Agenda (DDA), Korea may have to rein in rice support (WTO 2008). For example, a 40 percent cut in the AMS and keeping the same fixed payments over the implementation period would require a reduction in the target price to 140,000 won by 2017 (Lim et al. 2007).⁹ In other words, the variable payments would be subject to AMS ceilings.

If the country wants to avoid a weakening income safety net, it may opt to underpin decoupled or fixed payments. The transition from variable direct payments to decoupled support can be a tangible alternative from a policy perspective, and it should contribute to structural adjustment and a reform process by motivating competition and farmland mobilization. Two points are worth considering in this regard. First, the share of direct payments in agricultural budget accounts is still far lower than those in Japan, the European Union and the United States (Kim et al. 2006). Second, new regulations from the DDA are likely to exempt decoupled support from a reduction commitment so that a member country may be able to uphold a Green Box type of policy measures for a while.

⁹ The DDA modalities have suggested that developed countries other than the European Union, the United States and Japan cut their AMS by 45 percent and developing countries apply two-thirds of the reduction rate. A 40 percent cut is selected to reflect these reduction rates.

Reference

- Food and Agriculture Organization [FAO]. High-Level Round Table on Agricultural Trade Reforms and Food Security. *Background Paper*. Rome, 13 April 2005.
- Kim, B.S. and M.H. Kim. 2003. "Impacts of Direct Payments for Rice." Discussion Paper W12. (in Korean). Korea Rural Economic Institute.
- Kim, J.H., M.H. Sung, H.J. Kang and D.B. Han. 2006. *An Evaluation of and Tasks for Korean Rice Policies in the WTO Ruling*. Research Report R540. (In Korean). Korea Rural Economic Institute.
- Kim, Y.T., S.S. Lim, J.K. Park and H.P. Moon. 2004. *Establishment of Farm Income Compensation Programs and Farm Safety Nets*. Research Report R489. (In Korean). Korea Rural Economic Institute.
- Lee, J.H., M.H. Kim, J.H. Suh, J.O. Lee, J.S. Choi, D.M. Kim, and K.D. Kim. 1995. *Direct Payments under the WTO System*. Policy Report P14. (In Korean). Korea Rural Economic Institute.
- Lee, Yong-Keel. 2006. "The Degree of Decoupling of Direct Payments for Korea's Rice Industry under Uncertainty." *The Korean Journal of Agricultural Economics* 47 (2006): 115. (In Korean).
- Lim, S.S., S.H. Kim, and S.Y. Lim. 2007. "Outlook for DDA Agricultural Negotiations." *Agricultural Outlook 2007*, Research Report M81. (In Korean). Korea Rural Economic Institute.
- Ministry of Agriculture and Forestry. 2007. *Grain Policy Information*. March 2007. (In Korean).
- _____. 2003. *Agricultural Policy Yearbook 2003*. (In Korean).
- OECD. 2005a. "Decoupling: Illustrating Some Open Questions on the Production Impact of Different Policy Instruments." AGR/CA/APM(2005)11/FINAL. <<http://www.oecd.org/dataoecd/45/39/34815008.doc>>.
- _____. 2005b. "Decoupling: Policy Implications." AGR/CA/APM(2005)22/FINAL.
- Sakong, Yong. 2007. "Measuring the Degree of Decoupling of Direct Payment Program: An Evaluation of Simulations Considering the Different Production Costs among Farms." *The Korean Journal of Agricultural Economics* 48(2007): 1-22. (In Korean).
- Suh, J.H., M.H. Kim, N.W. Oh, K.C. Lee, Y.S. Hwang, H.J. Kim and K.J. Kim. 1996. *The Agricultural Support Mechanism under the WTO System*. Research Report C1996-12. (In Korean). Korea Rural Economic Institute.
- Sumner, D.A. and H. Lee. 2000. "Assessing the Effects of the WTO Agreement on Rice Markets: What Can We Learn From the First Five Years?" *Amer. J. Agr. Econ.* 82(August 2000): 709-717.
- Sung, M.H., H.S. Yoon and H.Y. Kim. 2003. *Model Development for the Rice Policy Evaluation*. Research Report R454. (In Korean). Korea Rural Economic

Institute.

United States Department of Agriculture [USDA]. 1999. *The EU's CAP: Pressures for Change*. Economic Research Service, WRS-99-2. <<http://www.ers.usda.gov/publications/Wrs992/Overview.pdf>>.

World Trade Organization. 2008. "Revised Draft Modalities for Agriculture." TN/AG/W/4/Rev.1, 8 February 2008.

_____. 2007. "Notification: the Republic of Korea." G/AG/N/KOR/37, 28 February 2007.

_____. 2006. "Agriculture Negotiations: Agriculture Domestic Support Simulations." JOB(06)/151, 22 May 2006.