Japanese Agricultural Trade Reform

A. Schmitz and T. Schmitz

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I. Introduction

Japan is the world's largest importer of agricultural products. Even so, agricultural imports in Japan are more restricted than in any other OECD country. Many of the instruments used by the Japanese to protect the agricultural sector fall under the general heading of quantitative restrictions; these include quotas and—to a lesser extent—import tariffs and domestic subsidies to farm inputs. As a result of border protection measures, domestic producer prices for Japanese grains in 1986 were an average 420 percent above world prices (Vincent, 1989). The corresponding margin for livestock products averaged 116 percent.

This research focuses on wheat, a major commodity imported by Japan. A significant distortion is caused by the Japanese Food Agency (JFA), which is responsible for purchasing wheat from abroad. The price paid for wheat in international markets is several times lower than the price JFA charges domestic millers. In addition, Japanese wheat farmers receive high price supports. These price supports are significantly above both the world price and the millers' price. The rent JFA captures on imports is used to pay for the wheat subsidies given to producers. JFA rents increased considerably in the late 1980s because of sharply falling wheat prices and an appreciating yen.

We begin our examination with a general discussion of protectionism in Japan and then go on to relate this to wheat in particular. We construct a theoretical model of the Japanese wheat sector and detail, under different data sets, the quota rents on wheat imports collected by the JFA and the

compensation it pays to Japanese wheat farmers. From this analysis, we show the effects of a free-trade world wheat market and examine how Japan would be affected. We calculate the effects of free trade on producers, consumers, and the JFA. Our results show the strong conclusion that, if both the Japanese yen (relative to the U.S. dollar) and wheat prices under free trade were at the same levels as in 1985 (assuming the 1985 levels to be a free-trade outcome in grains), the Japanese would suffer significant losses. That is, the consumers' gain from free trade is less than what the government loses in quota rents. We argue that it is possible for the Japanese to pursue an optimal import tariff policy on wheat, given the price distortions which exist in the world wheat market.

Even though Japan itself cannot influence the world price of wheat, the world price is significantly below the free-trade price because the wheat market is currently characterized as a world dumping market. Japan takes advantage of this situation by buying at lower prices than it could if a free-trade market existed.

II. Protection and the Wheat Economy

The major expansion in Japanese agricultural protection has occurred since the mid 1950s. Governments maintain the notion of food security—if not food self-sufficiency—and equity as expressed in terms of parity between farm and nonfarm incomes. Table 1 gives the nominal rates of protection in Japan for selected agricultural commodities from 1955-1986. The nominal rate of protection is frequently used to reflect the extent to which assistance raises the producer price of the product above the world price at the border. Despite the many shortcomings of this measure, it is a

Table 1. Nominal Rates of Protectionism in Japan for Selected Agricultural Commodities, 1955 - 1986

Commodity (percent)	1955	1960	1970	1980	1984	1986
Grains						
Rice	24	47	135	192	235	414
Wheat	31	51	134	261	318	541
Barley	24	52	158	307	363	611
Average						
(all grains)	24	48	135	196	239	420
Livestock products						
Beef	39	84	108	100	103	211
Pork	2	97	−9	17	21	86
Chicken	−52	19	18	23	9	67
Eggs	−19	−7	−9	−1	−7	42
Milk	4	5	212	186	185	338
Average						
(all livestock products)	−8	22	24	40	41	116

Source: Hayami (1987).

good general indicator of the high degree of protection afforded Japanese agriculture.

Table 1 also shows the extent to which protection has increased since 1955. For example, in 1955 the producer price of rice was 24 percent above the border price, but by 1980 this price differential had risen 192 percent. By 1986, it had risen by 414 percent. Protection is large, and has grown most quickly for land-intensive commodities. The numbers in Table 1 show that wheat receives an even higher degree of protection than rice—from 31 percent above the border price in 1955 to 541 percent in 1986.

Another measure of the degree of protection has been suggested and estimated. This is the Producer Subsidy Equivalent (PSE) measure. Because it incorporates assistance provided to agricultural inputs, the measure is broader than the nominal rate of protection gauge. Since input subsidies are a significant form of assistance to Japanese agriculture, the PSE measures are generally higher than the nominal rate of protection estimates shown in Table 1. For example, estimates by Walker (1988) using a PSE basis are as follows: rice, 565; wheat, 285; dairy products, 235; ruminant meats (mainly beef), 240; and nonruminant meats (mainly pork and chicken), 110.

Agricultural protection in Japan is provided by two types of instruments: border protection measures and domestic subsidies. Border protection measures are primarily in the form of quantitative restrictions against imports. In addition, there is a regime of import tariffs, but these are relatively low in ad valorem terms. For some products, including wheat, imports are controlled by government or semi-governmental trading agencies such as the JFA.

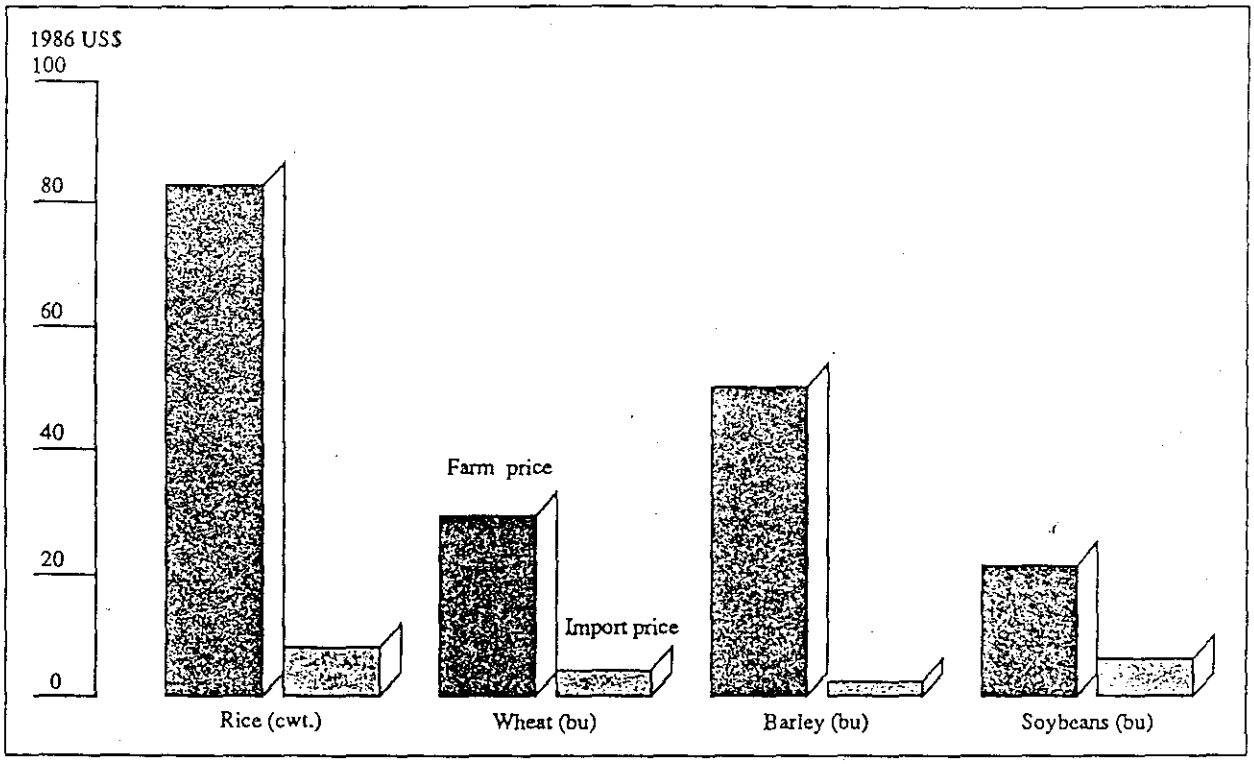
As we show in this paper, the tariff equivalent of the amount of protection provided by quantitative restrictions set at a particular level—as measured by the extent to which domestic prices are raised above world prices—will fluctuate over time in response to movements in foreign currency and exchange rates and world commodity prices. To the extent that the yen has appreciated against the currency in which world agricultural commodity prices are denominated, the amount of protection delivered by Japanese quotas has actually increased. Since the Japanese yen has appreciated considerably since 1985 against the U.S. dollar, the nominal rates of protection shown in Table 1 are considered low.

Figure 1 gives some indication of farm and import prices in Japan (Carter, McCalla, and Schmitz, 1989). Note the significant difference between the import and the farm price. The gap for wheat is not as high as for rice but, even so, producer prices in Japan are easily seven times the import price.

In a study prepared for the Economic Council of Canada, *Canada and International Grain Markets: Trends, Policies, and Prospects*, Carter et al. state:

> The pricing policy for wheat in Japan is highly distortionary. The farm price of wheat in periods of "tight" markets is four to five times the world price in Japan. The price paid by Japanese consumers, however, is somewhat lower but still well above the world export prices. For example, in 1986 the government purchasing price for wheat was $29.25/bushel—about six times the cost of imported wheat. On February 7, 1987, the Canadian Wheat Board f.o.b. price for wheat was U.S.$146.90 /ton, while the resale value (i.e., the price at which it was sold to mills for the Japanese Food Agency) was U.S.$559.00/ton. It is therefore clear that producer and consumer prices in Japan have no relationship to world prices. As world prices fall, their imports become cheaper. Internal prices (the price that the Japanese Food Agency charges consumers) do not fall in the period of declining

Farm and Import Prices, Japan, 1986



SOURCE American Embassy, Agricultural Affairs Office, Tokyo, Japan.

Figure 1. Farm and Import Prices, Japan, 1986

world prices; thus, the gap between internal Japanese prices and the world import price widens.

Japan buys the majority of its wheat from Australia, Canada, and the United States, which is its largest supplier. In 1984-85, exporters of wheat shipped roughly 5.7 million tons of wheat to Japan—over 50 percent came from the United States. The selling price to Japan fluctuates according to world market conditions and farm programs in many export countries. To highlight the Japanese wheat market, and the extent to which the JFA gains from a drop in world market prices, consider the impact of the 1985 U.S. Farm Bill, which set domestic target prices and loan rates for commodities in the United States, including wheat and corn. The target price is the price guaranteed to producers, while the loan rate—which is set well below the target price—is the floor price. As part of the 1985 Bill, loan rates were lowered by about $40 per ton. This substantial lowering of the loan rate by the United States—the world largest wheat exporter—enabled buyers such as Japan to buy imported grain more cheaply from all suppliers.

Clearly, Japan gains from a lower loan rate. Since Japanese producers and consumers are not affected directly because of fixed internal prices, the gains to the JFA—which can now purchase wheat on world markets at a lower price—are substantial. A drop in the loan rate of a dollar a bushel results in a gain to the JFA of roughly U.S.$200 million. The loss to Canada is roughly U.S.$45 million. The data reveal that historically, with a drop in world prices, the volume of Japanese imports does not rise because internal prices are fixed. To show how stable wheat imports are, in 1979-80 Japan imported 5.6 million tons; in 1980-81,

5.9 million tons; in 1981-82, 5.6 million tons; in 1982-83, 5.6 million tons; in 1983-84, 5.9 million tons; and in 1984-85, 5.7 million tons.

It is against this background that we construct a theoretical model of the Japanese wheat sector. This model will be used as a basis to provide empirical estimates of both the impact of existing wheat quotas and of free trade.

III. Theoretical Considerations

In the following model, because Japanese wheat imports are a small percentage of world wheat exports, the small-country assumption is made. That is, if Japan relaxed its quotas by 50 percent, the effect on world wheat prices would be insignificant. Consider Figure 2, where S_J is the Japanese supply curve for wheat and D_d is the domestic demand for wheat. The supported producer price is P_p, and the domestic production is Q_p. The JFA resale price is P^m, which is assumed to approximate the millers' price. The world distorted wheat price is W_p^*. The JFA imports Q_pQ_c of wheat at the world price, W_p^*. Since it sells this quantity at price P^m, it collects quota rents equal to the crosshatched area, bcde. Part of this is used to subsidize domestic producers equal to the amount P_pabP^m. Note that, although the transfer from the JFA to producers is P_pabP^m, the economic rent is only P_paP^m. This amount is important in compensation discussions since, if producers were producing Q_p and they were compensated to cease production, the amount of compensation needed is P_paP^m, not the entire transfer of P_pabP^m.

The following points are important:

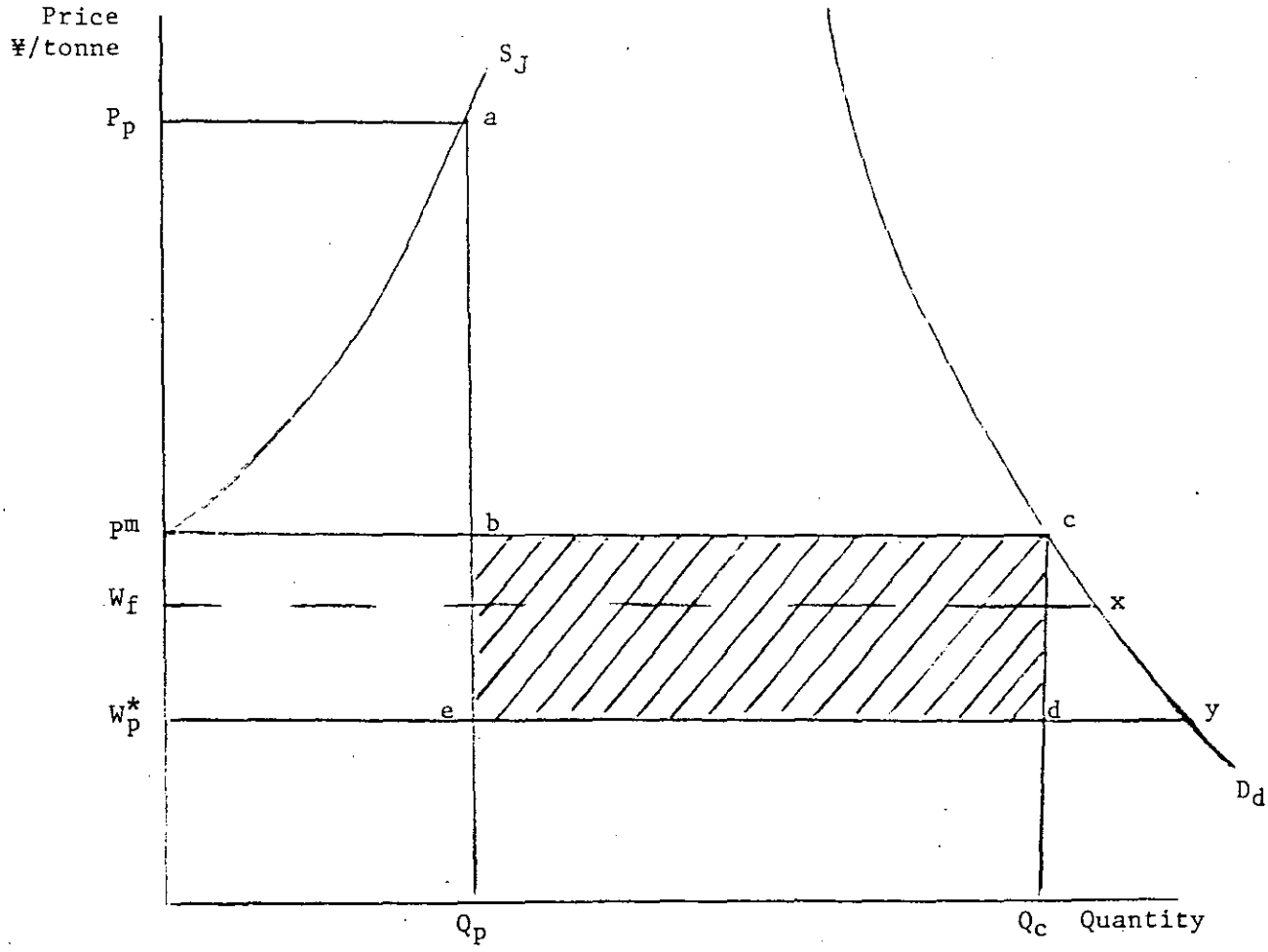


Figure 2. Japanese Wheat Import Protection

I. If W_p^* were the free-market price, wheat quotas of Q_pQ_c—with an accompanying producer transfer of P_pabP^m—would make the Japanese worse off under free trade. This is so because the JFA gain of bedc, minus the inefficiency loss of abP^m, is less than the cost to consumers from protectionism [i.e., $P^mcyW_p^* > bcde - abP^m$)].

II. If W_p^* is not the free-trade price—as it is not in the highly distorted wheat market where prices are much below free-trade levels—the Japanese quotas, in the presence of world price distortions, can be superior to those of a free-trade world. Suppose the free-trade price is W_f; a move to free trade would result in a loss to Japan since the JFA's loss in net rents, plus the producers' gain at the free-trade price, is greater than the gains to consumers. In essence, Japan can practice an optimal quota policy even if it is a small wheat importer, because the world import price is below the free market due to the distortionary production and trade policies of wheat exporters.

III. If the Japanese alone liberalized their wheat sector, Japan would lose because the world price would remain at W_p^*. The JFA would lose net rents equal to ($bcde - P_pabP^m$) and producers would lose rents equal to P_paP^m, but there would be an efficiency gain of abP^m and consumers would gain $P^mcyW_p^*$.

IV. In this scheme, to compensate producers in going to either free trade (at a world free-trade price of W_f) or to liberalize

an import at a distorted price of W_p^*, at least an amount, P_paP^m, is needed. In either case, domestic production would cease and millers would import at the world market price, whether free-trade or distorted.

V. In theory, if producers were paid P_pabP^m, their rents would be only P_paP^m. The net effect of free trade, given a free-trade price of W_f, would be

(1) a producer loss of P_paP^m;

(2) a JFA loss of (bcde - P_pabP^m);

(3) a consumer gain of P_mcxW_f; and

(4) a gain of abP^m, which is a "misallocation of resources" effect caused by overproduction of wheat.

Note, however, that if producers were paid a lump sum transfer equal to P_paP^m, the gains would be different since, under the distorted situation, the misallocation effect of abP^m would not exist.

VI. It is possible for a quota to be optimal but to become suboptimal once the JFA revenue is partially distributed to producers. For example, in Figure 2, cbed > P^mcxW_f; thus, quotas are optimal if producers receive lump sum payments. However, one could imagine a Japanese wheat supply curve such that (bcde - abP^m) < P^mcxW_f, making quotas suboptimal.

VII. The higher the shut-down price for Japanese wheat production, the greater the resource cost would be in using JFA

quota rents to subsidize producers. In Figure 2, the area under S_J and bounded by P^m grows as the shut-down price rises.

IV. Empirical Results

(1)

We estimated the model outlined in Figure 2. In Table 2, we provide estimates of the Ricardian rents producers in Japan receive under the current quota regime. These rents are estimated under two different Japanese producer supply schedules[1]. We also estimate the JFA's payments to producers and its quota rents. This allows us to provide the net gain to the JFA after payments have been made to producers. We provide estimates for 1985 using two different resale prices; price #1 is based on data obtained from MAFF Statistics Japan, price #2 is based on a report by Alston, et al. (1990). Results are expressed in billions of Japanese yen.

Using the resale prices reported by MAFF (price #1), the Ricardian rents range between ¥35 and ¥52 billion. The JFA payments to producers are ¥104 billion; JFA quota rents before paying producers amount to roughly ¥160 billion, leaving a net gain to the JFA after payments to producers of ¥56 billion. Because the JFA payments are not dependent on the intercept point of the internal supply schedule, only the Ricardian rent changes when the Japanese supply curve is changed.

1According to *JAPAN: Agricultural Statistics*, Agricultural Affairs Office, American Embassy, Tokyo, Japan, June 1989, wheat production costs are $1498/acre, or roughly $12.50 bushel (excluding labor costs). Thus, the minimun shut-down price is at least $10/bushel.

TABLE 2: Estimated Gains to the JFA and Japanese Producers From the Current Japanese Wheat Program in 1985 (Billions of Yen)

	Ricardian Rent	JFA Payment to Producers	JFA Quota Rents	Net Gain to the JFA
	Using Resale Price #1[a]			
Using Supply Curve #1:[c]	35.45	104.01	160.07	56.06
Using Supply Curve #2:[d]	52.00	104.01	160.07	56.06
	Using Resale Price #2[b]			
Using Supply Curve #1:[c]	35.45	92.36	227.85	135.49
Using Supply Curve #2:[d]	52.00	92.36	227.85	135.49

[a] "Resale Price #1" is the 1985 resale price listed in Table 5 of: MAFF, Statistics Department: POCKET NORIN SUISAN TOKEI-1987 (POCKET STATISTICS ON AGRICULTURE, FORESTRY, AND FISHRIES-1987), p.190.

[b] "Resale Price #2" is the 1986 resale price given in footnote #8 of: Alston, Carter, and Jarvis, "DISCRIMINATORY TRADE", CJAE 38(1990) pp. 197-214.

[c] "Supply Curve #1" is one estimated supply curve for Japanese domestic producers. It is a line with its intercept set at the Japanese producers' shutdown price. (converted to yen/tonne using the 1985 exchange rate). This results in a slope of 0.093.

[d] "Supply Curve #2" is another estimated supply curve for Japanese domestic producers. This time, the 1985 resale price is used as its intercept. This results in a slope of 0.136.

If the higher resale price (price #2) recorded by Alston et al. is used, the JFA quota rents are also higher—in the neighborhood of 228 billion yen. As a result, the payment to producers is smaller. In this case, the payment to producers is roughly ¥92 billion, and the net gain to the JFA after producers are paid is about ¥135 billion. Clearly, the higher the resale price, the smaller the JFA payment to producers, given a specific producer price support. Also, the higher the resale price, the larger the JFA quota rents collected.

(2)

World wheat prices (expressed in U.S. dollars) have dropped significantly since 1985, while the Japanese yen has appreciated against the U.S. dollar and Canadian and Australian currencies. Because these countries are the major wheat exporters to Japan, the Japanese economy has been significantly impacted. In 1985, the exchange rate for the Japanese yen was 240 yen per U.S. dollar; the 1990 exchange calculation was 147 yen per U.S. dollar. Table 3 presents estimates for 1990; since the calculations are all based on yen, the Ricardian rents to producers remain roughly the same as in Table 2. Note, however, the significant increase in the quota rents collected by the JFA. Using the resale price quoted by the MAFF (price #1), quota rents increase by over ¥100 billion annually. If resale price #2 is used, JFA quota rents increase by roughly ¥120 billion yen annually. As a result, even after the producers are paid, 1990 JFA rent gains are projected to be more than their gross total quota rents were in 1985.

TABLE 3: Estimated Gains to the JFA and Japanese Producers From the Current Japanese Wheat Program in 1990[1] (Billions of Yen)

	Ricardian Rent	JFA Payment to Producers	JFA Quota Rents	Net Gain to the JFA
	Using Resale Price #1[a]			
Using Supply Curve #1:[c]	33.55	100.86	271.13	170.27
Using Supply Curve #2:[d]	50.09	101.76	271.13	169.37
	Using Resale Price #2[b]			
Using Supply Curve #1:[c]	33.55	87.96	346.08	258.12
Using Supply Curve #2:[d]	50.09	88.74	346.08	257.34

[1] The 1990 import price was calculated as 50% of the average of the (1980, 1983, and 1985) import price, adjusted using the current exchange rate between the U.S. dollar and Japanese yen. The 1985 Japanese producer price and quantity were used as estimates of 1990 data. Either "Resale Price #1" or "Resale Price #2" (as noted below) was used as a proxy for the 1990 resale price.

[a] See Table 2.

[b] See Table 2.

[c] See Table 2.

[d] See Table 2.

(3)

The Japanese policy of redistributing quota rents to producers by providing price supports is inefficient (Figure 2). With high price supports in place, when the JFA distributes revenue to producers, the area under the domestic supply curve (bounded the resale price) represents a misallocation of resources. In this case, a lump sum payment to producers would be more efficient. In essence, a lump payment would represent not only a discounted present value stream of future incomes, but also the minimum payment needed for producers to cease production. Because of the nature of Japanese wheat production, we hypothesize that, if a lump sum payment were made to producers equal to the Ricardian rent area, domestic production would be greatly reduced or would cease altogether. As a result, the JFA would collect greater quota rents than indicated in either Tables 1 or 2 since import amounts would increase.

These interesting results for 1985 are shown in Table 4. Note that, when the JFA makes lump sum payments to domestic producers instead of paying them the difference between a target price and a resale price times the quantity produced, the JFA quota rents increase. Using price #1, they increase by roughly ¥27 billion; when price #2 is used, they increase by roughly ¥40 billion. These increases are a result of the increased imports due to the shutdown of domestic production. There is also a sizeable decrease in the payment to Japanese producers as the JFA is now paying just the Ricardian rent portion rather than the total price gap times the quantity produced. The net gain to the JFA is ¥152 billion under supply curve #1 (Table 4), as contrasted to only ¥56 billion when target prices are

TABLE 4: Estimated Gains to the JFA and Japanese Producers Using a more efficient Domestic Wheat Strategy (1985) (Billions of Yen)

	Lump Sum Payment to Domestic Producers	JFA Quota Rents[1]	Net Gain to the JFA
	Using Resale Price #1[a]		
Using Supply Curve #1:[c]	35.45	187.61	152.16
Using Supply Curve #2:[d]	52.00	187.61	135.61
	Using Resale Price #2[b]		
Using Supply Curve #1:[c]	35.45	267.04	231.59
Using Supply Curve #2:[d]	52.00	267.04	215.03

[1] The JFA quota rents under this strategy are larger since it is assumed that Japanese producers are getting a lump sum payment and are thus producing no output. Thus, Japan is importing the additional quantity that domestic producers were previously producing. This results in additional quota rents to the JFA.

[a] See Table 2.

[b] See Table 2.

[c] See Table 2.

[d] See Table 2.

used for producers (Table 2). This is a net gain of roughly ¥100 billion yen. Under supply curve #2, there is a greater Ricardian rent payment and the net gain is roughly ¥80 billion. Using resale price #2, the savings are roughly ¥95 billion for supply curve #1 and roughly ¥80 billion with supply curve #2.

(4)

When one does the same calculations for 1990 (Table 5), the gains to the JFA from lump sum payments become even greater. For example, with resale price #1 and supply curve #1, the net gain to the JFA increases by roughly ¥115 billion, using a lump sum payment mechanism rather than a target price scheme. Using resale price #2 and supply curve #1, the increase in net gains to the JFA are roughly ¥115 billion. Note that, as before, the absolute JFA quota rents increased when a lump sum payment is used. This is a result of the increased imports due to the decrease in domestic wheat production.

A caveat should be added; as stressed in the introduction, when a country's currency appreciates against the currencies of countries from which it buys a commodity, the rate of protection increases. The data clearly bear this out as can be observed from the increase in JFA quota rents between 1985 and 1990. However, part of this increase was due to the fall in world wheat prices denominated in U.S. dollars.

(5)

It follows from Figure 2 and the empirical results in Tables 1-5, that Japan would gain by a move to abandon both price supports for producers and its rigid system of setting millers' prices above the import price. Since

TABLE 5: Estimated Gains to the JFA and Japanese Producers Using a more efficient Domestic Wheat Strategy (1990)[1] (Billions of Yen)

	Lump Sum Payment to Domestic Producers	JFA Quota Rents[2]	Net Gain to the JFA
	Using Resale Price #1[a]		
Using Supply Curve #1:[c]	33.55	317.83	284.28
Using Supply Curve #2:[d]	50.09	318.24	268.15
	Using Resale Price #2[b]		
Using Supply Curve #1:[c]	33.55	405.68	372.13
Using Supply Curve #2:[d]	50.09	406.21	356.12

[1] The 1990 import price was calculated as 50% of the average of the (1980, 1983, and 1985) import price, adjusted using the current exchange rate between the U.S. dollar and Japanese yen. The 1985 Japanese producer price and quantity were used as estimates of 1990 data. Either "Resale Price #1" or "Resale Price #2" (as noted below) was used as a proxy for the 1990 resale price.

[2] The JFA quota rents under this strategy are larger since it is assumed that Japanese producers are getting a lump sum payment and are thus producing no output. Thus, Japan is importing the additional quantity that domestic producers were previously producing. This results in additional quota rents to the JFA.

[a],[b],[c],[d] See Table 2.

the wheat imports in Japan are a small percentage of the world total, Japanese policy would have little impact on world wheat prices. The gain to Japanese consumers outweighs the losses to Japanese producers and the JFA. Table 6 shows that there would be a substantial gain in removing wheat quotas and allowing millers to buy at the distorted international price. The net gain to Japan ranges between ¥150 and ¥180 billion per year. This sizeable gain is due, in part, to the very low level of world wheat prices.

Tables 7 and 8 illustrate the theoretical empirical results in a world where there is totally free trade in wheat. In this world, it is first assumed that the world wheat prices (in U.S. dollars) rise from their 1990 level to their 1985 level. It is also assumed that, because of free trade in manufactured goods as well as in agricultural products, the exchange rate between the Japanese yen and the U.S. dollar would be restored to the 1985 level. Using either supply curve and resale price #1, there would be a loss in quota rents to the JFA of ¥271 billion (Table 7). Consumers would gain ¥177 billion, leaving a gross loss to Japanese society of ¥94 billion . However, the resource misallocation effect discussed earlier must be taken into account. This would reduce the cost in moving to free trade, thereby reducing the loss to Japanese society. However, Japan would still sustain a net loss in moving to free trade. This is true regardless of the resale price or supply curve used. As we pointed out in the theoretical discussion, this result is consistent with the optimal tariff argument. The Japanese can, through the use of dollars, take advantage of a distorted world price which is below the free-trade price under the current quota system because the world wheat market is a dumping market.

Clearly, the gains or losses in moving to free trade from the present quota situation depend on the gap between the distorted world import price

TABLE 6: Estimated Gains to the Consumers and Japanese Society If the JFA and Producer Payments were Eliminated in 1990[1] (Billions of Yen)

	Loss in Ricardian Rent	Net Loss in Quota Rents by the JFA[2]	Gain in Resource Use Efficiency	Gain to Japanese Consumers	Net Gain to Japan
	Using Resale Price #1[a]				
Using Supply Curve #1:[c]	33.55	170.27	67.31	319.13	182.62
Using Supply Curve #2:[d]	50.09	169.37	51.67	319.13	151.34
	Using Resale Price #2[b]				
Using Supply Curve #1:[c]	33.55	258.12	54.41	407.35	170.09
Using Supply Curve #2:[d]	50.09	257.34	38.65	407.35	138.57

[1] The 1990 import price was calculated as 50% of the average of the (1980, 1983, and 1985) import price, adjusted using the current exchange rate between the U.S. dollar and Japanese yen. The 1985 Japanese producer price and quantity were used as estimates of 1990 data. Either "Resale Price #1" or "Resale Price #2" (as noted below) was used as a proxy for the 1990 resale price.

[2] The net quota rents were calculated as the actual quota rents that the JFA received minus the amount that the JFA paid to producers.

[a] See Table 2.

[b] See Table 2.

[c] See Table 2.

[d] See Table 2.

TABLE 7: Predicted Results from a Move to Free Trade 1990 Using a high Free Trade Price[1] (Billions of Yen)

	Loss in Quota Rents to the JFA	Gain in Consumer Surplus	Gross Loss to Japanese Society[2]	Net Loss to Japanese Society
	Using Resale Price #1[a]			
Using Supply Curve #1:[c]	271.13	176.65	94.49	27.17
Using Supply Curve #2:[d]	271.13	176.65	94.49	42.82
	Using Resale Price #2[b]			
Using Supply Curve #1:[c]	346.08	267.04	79.04	24.63
Using Supply Curve #2:[d]	346.08	267.04	79.04	40.39

[1] The 1990 free trade price was approximated using the 1985 import price, assuming the 1985 exchange rate. The 1990 import price was calculated as 50% of the average of the (1980, 1983, and 1985) import price, adjusted using the current exchange rate between the U.S. dollar and Japanese yen.

[2] The gross loss to Japanese society was calculated as the difference between the loss in quota rents to the JFA and the gain in consumer surplus. The producer effect that comes from the elimination of the inefficiency in production (due to the fact that it was inefficient for domestic producers to produce at all) is not taken into account. It is used for calculating the net loss given in the last column of the Table.

[a],[b],[c],[d] See Table 2.

TABLE 8: Predicted Results from a Move to Free Trade 1990 Using a Lower Free Trade Price[1] (Billions of Yen)

	Loss in Quota Rents to the JFA	Gain in Consumer Surplus	Gross Loss to Japanese Society[2]	Japanese Gains From Trade
	Using Resale Price #1[a]			
Using Supply Curve #1:[c]	271.13	268.98	2.15	65.17
Using Supply Curve #2:[d]	271.13	268.98	2.15	49.52
	Using Resale Price #2[b]			
Using Supply Curve #1:[c]	346.08	359.38	-13.30	67.71
Using Supply Curve #2:[d]	346.08	359.38	-13.30	51.95

[1] This lower 1990 free trade price was approximated as 75% of the 1985 average import price, adjusted using one half of the 1985 to 1990 exchange rate increase between the U.S. dollar and Japanese yen. The 1990 import price was calculated as 50% of the average of the (1980, 1983, and 1985) import price, adjusted using the current exchange rate between the U.S. dollar and Japanese yen.

[2] The gross loss to Japanese society was calculated as the difference between the loss in quota rents to the JFA and the gain in consumer surplus. The producer effect that comes from the elimination of the inefficiency in production (due to the fact that it was inefficient for domestic producers to produce at all) is not taken into account. It is used for calculating the gains from trade given in the last column of the Table.

[a],[b],[c],[d] See Table 2.

and the price which would exist under free trade. Table 8 shows that the results can be reversed if one assumes a lower free-trade price than would be used to calculate the results in Table 7. Note that there is a gross loss to Japanese society by moving to free trade if resale price #1 is used, but a gain if resale price #2 is used. However, when the resource inefficiency effect is taken into account, there is a net gain from trade.

In examining Tables 7 and 8, it is important to realize that, should the Japanese government pursue an efficient redistribution policy with respect to producers and then move to a free-trade outcome, the effects of such a move would be different than the results under the current situation of using price supports for producers. The results are clearly seen in Tables 7 and 8. If an efficient redistribution policy is pursued, the gross loss to Japanese society in moving to free trade is roughly ¥95 billion (Table 7). If a lower free-trade price is used, there is still a loss for resale price #2 in moving to free trade (Table 8); however, when resale price #1 is used in this scenario, the net effect is roughly zero.

Much has been written on the effects of trade liberalization in agriculture. Many empirical studies have been done on this topic, including those by Tyres and Anderson (1988). Estimates of the increase in the price of wheat due to free-trade policies range from roughly 15 to 35 percent. It is important, however, to note that these studies generally were based on the period in the early 1980s and late 1970s when wheat prices (in real terms) were significantly above even those in 1985. Therefore, in our modeling effort, if a free-trade price equal to the 1985 level is used (15 to 35 percent above the 1985 level), the Japanese would suffer significant losses in moving to freer trade in wheat. The results for 1985

already show these losses; but, if one assumes a free-trade price above the 1985 price, then the losses from free trade become larger.

In specific empirical studies on the effect of trade liberalization, the IIASA model predicted wheat prices to increase by 16 percent; the FAPRI model predicted a roughly 27 percent increase; and the Tyres and Anderson model predicted a 25 percent increase. It is important to reiterate, however, that these models covered a time period prior to the collapse in the wheat market in the late 1980s.

V. Conclusions and Implications

In this research, we have provided a theoretical basis for modeling the current Japanese internal wheat price structure and generated empirical estimates of the effect of this structure. First, these estimates show that transferring resources from the JFA to producers, where high price supports are maintained for the production sector, results in a substantial resource cost to the Japanese economy. A more efficient transfer would be a lump sum payment to producers. A second major result of this research shows that the Japanese economy would gain if Japan were to abandon its internal price mechanism and, instead, import and price wheat internally at the world distorted import price. The third major result reveals that the Japanese may not favor a world free-trade wheat market, but seem to prefer the quota system.

Our model shows that Japan has been very fortunate in being able to buy extremely cheap wheat on the world distorted market. World prices are below free-trade prices. Because Japan imports such a small percentage of the total world wheat traded, any change in Japanese wheat policy is likely

to have an insignificant effect on the world wheat market. Therefore, if the Japanese were to abandon their internal price structure and price wheat internally at the import price level, imports would not increase substantially. The increase would be somewhere in the neighborhood of 35 to 50 million bushels. It follows that Japan alone, by liberalizing, could not force the price of wheat up to a free-trade level. Clearly, major exporters such as the EC would have to remove their distortionary trade policies as well. However, as can be inferred from our results, the Japanese have no immediate interest in putting pressure on the EC; Japan actually gains from the current EC dumping strategy in the world wheat trade.

Further, our results show that Japan could gain more by abandoning its internal price structure and essentially compensating wheat farmers to either greatly reduce or cease wheat production entirely. Japan could also gain by allowing the millers' price to drop to the distorted world level, especially if the demand for wheat is somewhat price elastic. However, it is not a simple matter to compensate Japanese producers to cease wheat production. General taxation would have to be used to pay the compensation for their future income stream bescause the JFA would no longer exist to collect the quota rents which have been used, in part, to finance the Japanese wheat farmer.

There are also many other considerations, including the impact on rural communities from eliminating wheat farming in Japan; wheat farms there are quite numerous but are small in size. One must also remember that the Japanese farmer currently gains from the Japanese wheat price system, as does the JFA. It also appears that part of the JFA's rents are used to finance Japanese rice farmers. As a result, a strong coalition supporting the current regime appears to exist among rice

farmers, wheat farmers, and the JFA. If the JFA were abandoned, other sources of financing would be needed for both the wheat and rice sectors.

In examining these arguments, food security—which plays a major role in Japanese policy decision-making—must also be taken into account. The economics used in this discussion suggest that it may be efficient for Japan to use a lump sum payment method for farmers, but this would result in a decrease in food production. Japan would have to factor the policy and decision-making consequences of moving to a lump sum payment method into the national economic equation.

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