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IMPACT OF A RESALE PRICE INCREASE ON JAPAN'S WHEAT IMPORTS

Bruce L. Greenshields

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UNITED STATES DEPARTMENT OF AGRICULTURE

ECONOMIC RESEARCH SERVICE

FOREIGN AGRICULTURAL ECONOMIC REPORT NO. 128

IMPACT OF A RESALE PRICE INCREASE ON JAPAN'S WHEAT IMPORTS, by Bruce L. Greenshields. Economic Research Service, U.S. Department of Agriculture. Foreign Agricultural Economic Report No. 128.

ABSTRACT

An econometric model isolated the impact of a resale price increase on Japan's wheat imports. It predicts that with other factors held constant, the 16.4-percent increase in the Japanese Government's resale price of wheat as of July 1, 1976, would cost the United States \$30 million in lost sales of wheat to Japan during July 1976-June 1977.

KEYWORDS: Forecasting, Japan, short run, trade, wheat.

FOREWORD

This study describes an econometric model to estimate the effects of changes in quantifiable determinants on Japan's wheat imports—one part of the process of making short term forecasts of U.S. agricultural exports to Japan. The resulting information is being used along with analysis of other factors affecting Japan's wheat imports to arrive at the official U.S. Department of Agriculture forecast, which is published periodically in *Foreign Agricultural Circular: Grains.* The results of the present study are published to isolate only the effect on imports of the recent increase in the Japanese resale price of wheat.

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February 1977

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SUMMARY

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The Japanese Government raised the resale price of imported wheat by 16.4 percent on July 1, 1976. This study estimates the parameters of a wheat consumption function using an econometric model. With other factors held constant, the model predicts the volume of Japan's wheat imports in the short term at the latest resale price. This volume is then compared with what the volume would have been if the resale price had remained at the previous level, set on January 20, 1976.

Results of the model are that the price increase of July 1, 1976, would lower wheat imports during July 1976-June 1977 by 300,000 metric tons. Assuming that the U.S. share of the loss in sales would be equal to the U.S. share of Japan's total wheat imports, the dollar loss to U.S. exporters would be about \$30 million (at U.S. average f.o.b. prices for U.S. fiscal year 1975/76).

IMPACT OF

A RESALE PRICE INCREASE

ON JAPAN'S WHEAT IMPORTS

By Bruce L. Greenshields ¹

INTRODUCTION

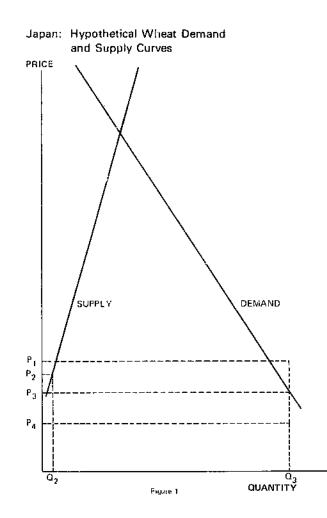
Japan is an important market for U.S. wheat exports. In U.S. fiscal year 1975/76, U.S. sales of wheat to Japan amounted to 3.3 million metric tons and were valued at \$543 million, 11 percent of total U.S. wheat exports.

The Japanese Government directly controls wheat imports as part of its policy to provide staple foods to Japanese consumers at relatively low prices. The Government sets the prices at which imported and domestic wheat are resold to millers, as well as the price at which the domestic crop is purchased $(8)^2$. These prices determine the volume of imports, as can be seen in figure 1. Price P_2 is the support price for domestic wheat which generates the production volume of Q_2 . Price P_3 is the average Government resale price of domestic and imported wheat paid by millers who demand the total volume of Q_3 at that price. The amount imported is $Q_{31} - Q_2$.

The wheat pricing decisions depend to a large extent on rice policies, because rice and wheat products are close substitutes in the Japanese diet. At present the rice policies are aimed at maintaining a total rice consumption which is constant (thus implicitly allowing for a 1.4-percent annual decline in per capita consumption because of population growth) and equal to domestic production. The desire of the Japanese Government is to maintain rice consumption in order to limit dependence on imported food (and feed).

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²Italicized numbers in parentheses refer to references listed at the end of this report.



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Rice prices are also administered by the Government, and because rice and wheat products are substitutes, the rice price is a wheat demand shifter. An increase in the rice price, *ceteris paribus*, will shift the wheat demand curve (fig. 1) to the right, thus increasing the volume of wheat imports. Likewise, a decrease in the rice price, *ceteris paribus*, will shift the wheat demand curve to the left, thus decreasing the volume of wheat imports. Therefore, the Government-administered wheat and rice prices jointly determine wheat imports, together with the other traditional determinants of wheat supply and demand.

The Government resale price of imported wheat until 1973 has been higher than the landed price in Japan—at times by as much as 50 percent. This tax, or "skimming," as it is often called, had been used to help finance the differences between the purchase and resale prices of domestic wheat and rice. It had also been used to defray the administrative costs of purchasing and handling the imported wheat. But during 1973-75, the landed price in Japan exceeded the resale price, at times by as much as a half, in effect constituting an import subsidy. This situation was allowed to prevail because of the Government's efforts to curb retail price increases at that time.

The effects of the subsidy or tax can be seen graphically in figure 1. If the world price is P_1 and the resale price is P_3 , the import subsidy is $P_1 - P_3$ per unit, or equal to the total value of $P_1(Q_3 - Q_2) - P_3(Q_3 - Q_2)$. Likewise, if the world price is P_4 and the resale price is P_3 , the import tax is $P_3 - P_4$ per unit, or equal to the total value of total value of $P_3(Q_3 - Q_2) - P_4(Q_3 - Q_2)$.

The change in the wheat resale price which occurred on July 1, 1976, put the resale price about a fifth greater than the landed price. The average increase for all imported wheat was 16.4 percent over the resale price which has been in effect since January 20, 1976. For U.S. Western White No. 2, the increase was 14 percent (table 1).

The purpose of this study is to estimate how this latest price change will affect wheat imports in the short run.

| Japanese fiscal year | April | Мау | June | July | August | September | October |
|----------------------------|--------|--------|--------|-------------|----------------------|-----------|---------|
| | | | | Yen per met | ric ton ¹ | | |
| 1960/61 | 35,910 | 35,910 | 35,910 | 35,910 | 35,910 | 35,910 | 35,910 |
| 1961/62 | 35,910 | 35,910 | 35,910 | 35,450 | 35,450 | 35,450 | 35,450 |
| 1962/63 | 35,450 | 35,450 | 35,450 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1963/64 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1964/65 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1965/66 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1966/67 | 35,200 | 35,200 | 35,200 | 34,920 | 34,920 | 34,920 | 34,920 |
| 1967/68 | 34,920 | 34,920 | 34,920 | 34,640 | 34,640 | 34,640 | 34,640 |
| 1968/69 | 34,640 | 34,640 | 34,640 | 34,650 | 34,650 | 34,650 | 34,650 |
| 1969/70 | 34,650 | 34,650 | 34,650 | 34,460 | 34,460 | 34,460 | 34,460 |
| 1970/71 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 |
| 1971/72 | 34,460 | 34,460 | 34,460 | 34,530 | 34,530 | 34,530 | 34,530 |
| 1972/73 | 34,530 | 34,530 | 34,530 | 33,690 | 33,690 | 33,690 | 33,690 |
| 1973/74 | 33,690 | 33,690 | 33,690 | 33,690 | \$3,670 | 33,670 | \$3,670 |
| 1974/75 | 45,760 | 45,760 | 45,760 | 45,760 | 45,250 | 45,250 | 45,250 |
| 1975/76 | 45,250 | 45,250 | 45,250 | 45,250 | 45,200 | 45,200 | 45,200 |
| 1976/77 | 53,220 | 53,220 | 53,220 | 60,660 | 60,660 | 60,660 | 60,660 |

Table 1-Japan: Government resale price of U.S. Western White #2

Footnote at end of table.

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Continued-

| Japanese fiscal year | November | December | January | February | March | Average |
|----------------------------|----------|----------|-------------------|----------------|----------|---------|
| | | | Yen per metric to | n ¹ | <u> </u> | • |
| 1960/61 | 35,910 | 35,910 | 35,910 | 35,910 | 35,910 | 35,910 |
| 1961/62 | 35,450 | 35,450 | 35,450 | 35,450 | 35,450 | 35,565 |
| 1962/63 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,263 |
| 1963/64 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1964/65 | 35,200 | 35,290 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1965/66 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| 1966/67 | 34,920 | 34,920 | 34,920 | 34,920 | 34,920 | 34,990 |
| 1967/68 | 34,640 | 34,640 | 34,640 | 34,640 | 34,640 | 34,710 |
| 1968/69 | 34,650 | 34,650 | 34,650 | 34,650 | 34,650 | 34,648 |
| 1969/70 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 | 34,508 |
| 1970/71 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 | 34,460 |
| 1971/72 | 34,530 | 34,530 | 34,530 | 34,530 | 34,530 | 34,513 |
| 1972/73 | 33,690 | 33,690 | 33,690 | 33,690 | 33,690 | 33,900 |
| 1973/74 | 33,679 | 45,760 | 45,760 | 45,760 | 45,760 | 37,707 |
| 1974/75 | 45,250 | 45,250 | 45,250 | 45,250 | 45,250 | 45,420 |
| 1975/76 | 45,200 | 45,200 | 45,200 | 53,220 | 53,220 | 46,553 |
| 1976/77 | 60,660 | 60,660 | 60,660 | 60,660 | 60,660 | 58,820 |

Table 1-Japan: Government resale price of U.S. Western White #2-continued

¹Excluding bagging cost (1,090 yen per metric ton in 1975/76) and contract production bounty (600 yen per metric ton in 1975/76).

Source: Government of Japan, Ministry of Agriculture and Forestry, Food Agency.

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METHOD OF ANALYSIS

Wheat imports are determined by the demand for wheat and the domestic supply of wheat, as shown in figure I. At any particular price, the total quantity supplied is equal to domestic production plus imports, and the total quantity demanded is equal to consumption plus exports plus the change in stocks, giving the following identities:

> Equation 1 QS = Y + MEquation 2 $QI = C + X + \Delta S$ Equation 3 QS = QDEquation 4 $Y + M = C + X + \Delta S$ Equation 5 $M = C + X + \Delta S - Y$

Where:

QS = Quantity supplied

Y = Domestic production

M = Imports

QD = Quantity demanded

- C = Consumption
- X = Exports
- $\Delta S = Change in stocks$

Observed values of these variables are given in table 2 for Japanese fiscal years (April-March) 1960/61-1975/76. The quantity supplied is predominantly imports in recent years. Exports are relatively insignificant, as are changes in stocks, relative to consumption.

A structural equation is used to describe and predict the demand for wheat for consumption, and the other variables on the right side of equation 5 are exogenous. Thus, the values for X, Δ S, and Y are predicted on the basis of any available information, such as planting intentions and stock policies.

| Japanese fiscal year | Quantity supplied (QS) | | Quanti | Total | | |
|----------------------------|------------------------|-------------|-----------------|-------------|-------------------------------|---------------------------------------|
| | Production (Y) | Imports (M) | Consumption (C) | Exports (X) | Change in stocks (ΔS) | demanded and supplier (QS = QD) |
| | | | 1,000 metri | c tons | | |
| 1960/61 | 1,531 | 2,660 | 3,965 | 17 | 1 7 5 | |
| 1961/62 | 1,781 | 2,660 | 4,190 | 47 | 179 | 4,191 |
| 1962/63 | 1,631 | 2,490 | • | 71 | 180 | 4,441 |
| 1963/64 | 716 | | 4,272 | 93 | -244 | 4,121 |
| 1964/65 | 1,244 | 3,412 | 4,290 | 73 | -235 | 4,128 |
| | 1,234 | 3,471 | 4,505 | 68 | 142 | 4,715 |
| 1965/66 | 1,287 | 3,532 | 4,631 | 88 | 100 | - |
| 1966/67 | 1,024 | 4,103 | 4,983 | | 100 | 4,819 |
| 1967/68 | 997 | 4,238 | 5,106 | 79 | 65 | 5,127 |
| 1968/69 | 1,012 | 3,996 | • | 87 | 42 | 5,235 |
| 1969/70 | 758 | 4,537 | 5,092 | 114 | -198 | 5,068 |
| | 100 | 4,007 | 5,245 | 81 | -31 | 5,295 |
| 1970/71 | 474 | 4,621 | 5,207 | 47 | ~159 | 5 0 05 |
| 1971/72 | 440 | 4,726 | 5,206 | 55 | | 5,095 |
| 1972/73 | 284 | 5,317 | 5,372 | | -95 | 5,166 |
| 1973/74 | 202 | 5,369 | 5,498 | 56 | 173 | 5,601 |
| 1974/75 | 232 | 5,485 | | 38 | 35 | 5,571 |
| • • | 446 | 0,400 | 5,517 | 26 | 174 | 5,717 |
| 975/76 | 24 1 | 5,726 | 5,732 | 35 | 200 | 5,967 |

Table 2-Japan: Wheat quantities supplied and demanded

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Source: Government of Japan, Ministry of Agriculture and Forestry, Food Balance Sheet, annual issues, except for 1975/76 which is estimated based on actual trade and production from: Ministry of Finance, Japan Exports and Imports, various monthly issues; and Ministry of Agriculture and Forestry, Monthly Statistics of Agriculture, Forestry, and Fisheries, June 1976.

Wheat consumption is mainly a function of the wheat price, population, income, the price of close substitutes, and consumer preferences, such that:

Equation 6

C = f(P, POP, I, SUB, T)

Where:

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| Ρ | = | Wheat price |
|----------------|---|----------------------------|
| \mathbf{POP} | = | Population |
| Ι | = | Income |
| SUB | = | Price of close substitutes |
| т | = | Consumer preferences |

The approach is to estimate the parameters of the function (equation 6) and to predict the volume of imports in the short term at the latest resale price. This volume is then compared to what the volume would have been if the resale price had remained at the previous level, set on January 20, 1976.

RESULTS OF THE STATISTICAL ANALYSIS

The functional relationship (equation 6) is specified as linear in equation 7. The coefficients are estimated by ordinary least squares regression analysis. The sample period is Japanese fiscal years 1960/61-1975/76. Data used in the wheat consumption function are given in table 3. The equation and its estimated coefficients are as follows:

Equation 7

C/POP = 77.8008 - 0.6448(P/IPD) - 17.9667 [(I/IPD)/POP] (0.1454) (6.7900)

| (0.1404) | (0.1300) |
|----------|----------|
| (4.4334) | (2.6460) |
| (0.9992) | (0.9787) |
| | |

+ 0.0579 (SUB/IPD) (0.0291) (1.9853) (0.9296)

Where:

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| C/POP | Wheat consu | imption per capita, kilograms per |
|-------------|--------------|---------------------------------------|
| | person | |
| P/IPD | Real wheat | price (resale price of U.S. Western |
| | White No. 2/ | GNP implicit price deflator), yen |
| - | per kilogram | |
| (I/IPD)/POP | Real GNP per | r capita, million yen per person |
| SUB/IPD | Real rice | price (resale price of domestic |
| | rice/GNP im | plicit price deflator), yen per kilo- |
| | gram, brown | |

The standard errors of the beta coefficients are in parentheses under the coefficients. The "t" statistics are in parentheses under the standard errors. The levels of significance of the beta coefficients are in parentheses under "t" statistics.

Other statistics of the equation are: Coefficient of determination $(R^2) = 0.91$ Standard error of the estimate = 0.9485 Mean of the dependent variable = 48.2991 Coefficient of variability (percent) = 1.96 Durbin-Watson (d) = 1.50

The derived demand elasticities, measured at the means of the variables, are:

| Price (P/IPD) | = | -0,54 |
|-----------------------|---|-------|
| Income [(I/IPD)/POP] | | |
| Cross price (SUB/IPD) | = | 0.14 |

| Japanese fiscal year | Consumption (C) | Wheat resale price (P) | Population (POP) | Income (I) | Rice resale price (SUB) |
|----------------------------|----------------------|------------------------------|---------------------|------------------|-------------------------------|
| | 1,000 metric tons | Yen per metric ton | Million persons | Billion yen | Yen per metric ton |
| 1960/61 | 3,965 | 35,910 | 93.419 | 16,207 | 72,520 |
| 1961/62 | 4,190 | 35,565 | 94.287 | 19,853 | 72,100 |
| 1962/63 | 4,272 | 35,263 | 95.181 | 21,660 | 71,900 |
| 1963/64 | 4,290 | 35,200 | 96.156 | 25,592 | 80,317 |
| 1964/65 | 4,505 | 35,200 | 97.182 | 29,662 | 79,717 |
| 1965/66 | 4,631 | 35,200 | 98.274 99.036 | 32,814 38,419 | 92,827 101,78€ |
| 1966/67 | 4,983 | 34,990 34,710 | 100.196 | 45,297 | 100,750 |
| 1967/68 1968/69 | 5,106 5,092 | 34,648 | 101.331 | 53,288 | 115,617 |
| 1969/70 | 5,245 | 34,508 | 102.536 | 62,260 | 124,950 |
| 1970/71 | 5,207 | 34,460 | 104.665 | 73,046 | 124,027 |
| 1971/72 | 5,206 | 34,513 | 106.093 | 81,577 | 122,947 |
| 1972/73 | 5,372 | 33,900 | 107.589 | 94,729 | 126,357 |
| 1973/74 | 5,498 | 37,707 | 109.102 | 115,605 | 130,100 |
| 1974/75 | 5,517 | 45,420 | 110.573 | 136,339 | 150,217 |
| 1975/76 | 5,732 | 46,553 | 111.934 | 149,092 | 189,882 |

Table 3-Japan: Variables in the wheat consumption function

Sources at end of table.

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| Japanese fiscal year | Implicit price deflator (IPD) | Per capita consumption (C/POP) | Real wheat resale price (P/IPD) | Per capita real income [(I/IPD) POP] | Real rice resale price (SUB/IPD) |
|----------------------------|---|--------------------------------------|--|---|--|
| | Calendar year | Kilograms per | Yen per | Million yen | Yen per |
| | 1970 = 1,000 | person | kilogram | per person | kilogram |
| 1960/61 | 619 | 42.4432 | 58.0129 | 0.280270 | 117,157 |
| 1961/62 | 668 | 44.4388 | 53.2410 | 0.315208 | 107,934 |
| 1962/63 | 685 | 44.8829 | 51.4788 | 0.332214 | 104,964 |
| 1963/64 | 719 | 44.6150 | 48.9569 | C.370168 | 111.707 |
| 1964/65 | 754 | 46.35 63 | 46.6844 | 0.404803 | 105.725 |
| 1965/66 | 789 | 47.1233 | 44.6134 | 0.423198 | 117.651 |
| 1966/67 | 831 | 50.3150 | 42.1059 | 0.466823 | 122.486 |
| 1967/68 | 867 | 50.9601 | 40.0346 | 0.521435 | 116.205 |
| 1968/69 | 905 | 50.2512 | 38.2851 | 0.581083 | 127.754 |
| 1969/70 | 952 | 51.1528 | 36.2479 | 0.637817 | 131.250 |
| 1970/71 | $1,013 \\ 1,054 \\ 1,115 \\ 1,278 \\ 1,510$ | 49.7492 | 34.0178 | 0.688947 | 122.435 |
| 1971/72 | | 49.0702 | 32.7448 | 0.729525 | 116.648 |
| 1972/73 | | 49.9308 | 30.4036 | 0.739660 | 113.325 |
| 1973/74 | | 50.3932 | 29.5047 | 0.829112 | 101.800 |
| 1974/75 | | 49.8946 | 30.0795 | 0.816571 | 99.481 |
| 1975/76 | 1,502 | 51.2087 | 29.0593 | 0.831438 | 118,528 |

Table 3-Japan: Variables in the wheat consumption function-continued

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Sources: C =from table 2.

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P - from table 1.

POP - Office of the Prime Minister of Japan, Monthly Statistics of Japan, Apr. 1976.
 I and IPD - Economic Planning Agency, Annual Report on National Income Statistics, 1976, and Japanese Economic Indicators, June 1976.
 SUB - Government of Japan, Ministry of Agriculture and Forestry, Food Agency.

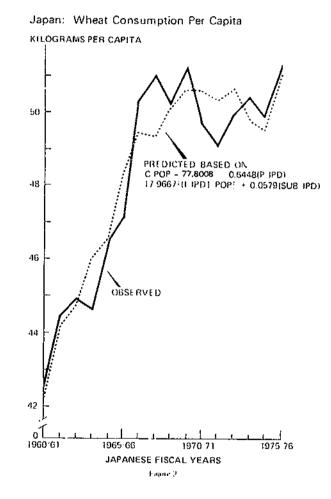
Wheat consumption and income are specified in per capita terms, implicitly assuming a population elasticity of 1. This specification is necessary because the simple intercorrelation between population and income is high (0.99), and their separate effects cannot be distinguished if both are included as separate explanatory variables, since they are virtually identical vectors.

The resale price of Western White No. 2 is used to indicate changes in the average resale price for all imported wheats. The Government resale price for the various wheats was based on fixed differentials so that the resale price variation of Western White No. 2 would indicate the average resale price variation of all wheats. The system of fixed differentials only recently has been dropped, but it does not affect the sample. The announced average increase of 16.4 percent is simply an average of the resale prices for all imported wheats—not weighted as to the relative volumes of each type of wheat.

The average resale price of rice is specified as the main substitute price. Consumer preferences are not included as a quantified variable. Gradual shifts in consumer preferences could be handled by including a linear trend variable. But the simple intercorrelation between a linear trend and P/IPD is high (0.99), thus precluding the possibility of isolating the effects of shifts in consumer preferences if there were any in the sample period. In any case, interpreting the trend coefficient would be difficult, because it absorbs most of the unexplained variation of the dependent variable (3).

The tracking ability of the model is depicted in figure 2. The predictions made from the equation are given in table 4 for Japanese fiscal year 1976/77 (April-March), U.S. wheat marketing year 1976/77 (June-May), Japanese wheat marketing year 1976/77 (July-June), and U.S. fiscal year 1976/77 (October-September). Predictions are based on the resale price that became effective on January 20, 1976 (I), and on the resale price that became effective on July 1, 1976 (II), which is assumed unchanged throughout the forecast period. Only P is allowed to vary, and thus the difference between imports under I and II is attributable to the price increase.

Whatever values are estimated for X, Δ S, and Y are immaterial to the purpose of this paper as they do not affect the difference between I and II. POP is estimated based on an annual growth rate of 1.4 percent. I and IPD are based on projections by the Japan Economic Research Center (5). SUB is based on the actual resale price which was raised by 10.2 percent on September 1, 1976 (the previous price had been in effect since September 1, 1975), and SUB assumes no change throughout the forecast period.



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| Year ¹ | Imports (M) | Consumption (C) | Exports (X) | Change in stocks (ΔS) | Production (Y) | | |
|-----------------------|-------------------|--------------------|----------------|--------------------------------|-------------------|--|--|
| | 1,000 metric tons | | | | | | |
| Apr. 1976/Mar. 1977: | | | | | | | |
| I | 5,478 | 5,594 | 25 | 100 | 241 | | |
| II | 5,236 | 5,352 | 25 | 100 | | | |
| 1 – 11 | 242 | 242 | 0 | 0 | 241 0 | | |
| June 1976/May 1977: | | | | | - | | |
| I | 5,500 | 5,616 | 25 | - • • | | | |
| 11 | 5,213 | 5,329 | 25 | 100 | 241 | | |
| I – II | 287 | 287 | 25 | 100 | 241 | | |
| | | 201 | U | 0 | 0 | | |
| July 1976/June 1977: | | | | | | | |
| I | 5,515 | 5,631 | 25 | 100 | 241 | | |
| II | 5,201 | 5,317 | 25 | 100 | 241 241 | | |
| I – II | 314 | 314 | 0 | 100 | 241 | | |
| | | | * | 0 | v | | |
| Oct. 1976/Sept. 1977: | | | | | | | |
| i TT | 5,542 | 5,658 | 25 | 100 | 241 | | |
| П | 5,233 | 5,349 | 25 | 100 | 241 | | |
| I – II | 309 | 309 | 0 | 0 | 0 | | |

Table 4-Japan: Wheat import predictions

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| Year ¹ | Wheat resale price (P) | Population (POP) | Income (I) | Rice resale price (SUB) | Implicit price deflator (IPD) |
|-----------------------|------------------------------|---------------------|----------------|----------------------------------|--|
| | Yen per metric ton | Million persons | Billion yen | Yen per metric ton | Calendar year 1970 = 1,000 |
| Apr. 1976/Mar. 1977: | | | | | |
| I | 53,220 | 113.501 | 170,185 | 215,531 | 1,711 |
| II | 58,880 | 113,501 | 170,185 | 215,531 | 1,711 |
| I – II | -5,660 | 0 | 0 | 0 | 0 |
| June 1976/May 1977: | | | | | |
| I | 53,220 | 113,766 | 176,432 | 218,992 | 1,741 |
| Ц | 60,040 | 113.766 | 176,432 | 218,992 | 1,741 |
| I – II | -6,820 | 0 | 0 | 0 | 0 |
| July 1976/June 1977: | - | | | | |
| Ĭ | 53,220 | 113.898 | 176,432 | 220,722 | 1,741 |
| II | 60,660 | 113.898 | 176,432 | 220,722 | 1,741 |
| I – II | -7,440 | 0 | 0 | 0 | 0 |
| Oct. 1976/Sept. 1977: | | | | | |
| I | 53,220 | 114.296 | 182,961 | 224,183 | 1,771 |
| п | 60,660 | 114.296 | 182,961 | 224,183 | 1,771 |
| I – II | -7,440 | ` O | 0 | 0 | 0 |

Table 4-Japan: Wheat import predictions-continued

 1 See text for explanations of I and II.

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RELATED RESEARCH IN ERS

A wheat demand equation was estimated by Rojko (6) on a relatively short time series sample of 11 annual observations (1957-67). As in the present study, the rice price was significant. The beta coefficient on income was positive in Rojko's equation and consistent with his expectations at that time. But Hashimoto (7), whose study³ was partly financed by the Economic Research Service (ERS), estimated Rojko's equation (same variables and functional forms) with a time series sample of 19 observations (1955-73). He found the beta coefficient on income to be insignificant. Hashimoto also estimated a demand function with the same variables and functional form as in the present study, but then he proceeded to drop income from the specification because of an insignificant beta coefficient. One possible explanation for Hashimoto's difficulty with the income variable is his treatment of the data. He has some unintended partial lags in his equation because he deflated prices, which were averaged over April-March years (Japanese fiscal years), by the calendar year consumer price index; his real income variable was on a calendar year basis; his population variable was midyear of the Japanese fiscal year, and his consumption variable was on a Japanese fiscal year basis. In the present study, all variables are Japanese fiscal year averages, including the price deflator.

Another earlier ERS study (4) contains an equation to estimate Japan's wheat import demand, and the specification in the present study represents a refinement in that the explanatory variables are separated into those that are predicted stochastically and those that are predicted from a deterministic model. The earlier model (4) was a nonlinear equation, and that specification was tested on the sample used in the present study. It was concluded that the improvement in the fit was not enough to merit using the complication of logarithmically transforming the data.

An ERS model of the U.S. wheat sector is being developed that includes an endogenous treatment of the export sector (2). This model contains a demand equation with Japan's per capita imports of U.S. wheat specified as the dependent variable. The explanatory variables are Japanese wheat production plus beginning stocks, real per capita income, real resale price of Western White No. 2, and a dummy variable for U.S. dock strikes—a major determinant in the historical variation in the U.S. share of the Japanese market.

Finally, ERS is having a study prepared in cooperation with Wheat Associates, U.S.A. (1), which will fully detail how the resale price of wheat is determined, including such factors as the relative importance of the rice price, the international wheat price, and Japanese economic objectives. This study should be completed and published by ERS in 1977.

[&]quot;Takayama is the principal author, but the chapter on Japan was written by Hashimoto.

REFERENCES

 Flour Millers Association Wheat Resale Pricing and Import Determination. (In progress under contract with E.on. Res. Serv. and in cooperation with Wheat Assoc., U.S.A.) Tokyo.

(2) Gallagher, Paul W. An Outline for Wheat Sector Specification and Some Preliminary Export Sector Results. Econ. Res. Serv. Rpt. No. 13. Cross-Commodity Model Project, U.S. Dept. Agr., Econ. Res. Serv., May 19, 1976.

- (3) George, P.S. and G.A. King Consumer Demand for Food Commodities in the United States with Projections for 1980. Giannini Foundation Monograph No. 26, Berkeley, Calif., Mar. 1971, pp. 19-20.
- (4) Greenshields, Bruce L. Changes in Exchange Rates—Impact on U.S. Grain and Soybean Exports to Japan. Econ. Res. Serv. Foreign Rpt. No. 364, U.S. Dept. Agr., Econ. Res. Serv., July 1974.
- (5) Japan Economic Research Center "18-Month Forecast—Business Is Slated to Recover Gradually with Increase of Exports Becoming Spurring Force," The Japan Economic Journal. Tokyo, July 6, 1976, pp. 11ff.
- (6) Rojko, Anthony S., Francis S. Urban, and James J. Naive World Demand Prospects for Grain in 1980. Foreign Agr. Econ. Rpt. No. 75, U.S. Dept. Agr., Econ. Res. Serv., Dec. 1971.
- (7) Takayama, T., H. Hashimoto, and S. Schmidt Projection and Evaluation of Trade and Policies in Agricultural Commodity Supply, Demand, International Trade, and Food Reserves. Project Report No. 1, AE-4405, Dept. Agr. Econ., Univ. III. at Urbana-Champaign, June 1976.
- (8) Wheat Associates, U.S.A.
 Wheat Importation and Marketing in Japan. Food Life Improvement Assoc., Tokyo, 1971.

| Year | Rate | | |
|-----------------------|---------------------|--|--|
| | Yen per U.S. dollar | | |
| Calendar years: | | | |
| 1960-70 | 360.00 | | |
| 1971 | 350.74 | | |
| 1972 | 308.00 | | |
| 1973 | 292.19 | | |
| 1974 | 291.51 | | |
| 1975 | 296.80 | | |
| apanese fiscal years: | | | |
| 1960-70 | 360.00 | | |
| 1971 | 337.80 | | |
| 1972 | 302.03 | | |
| 1973 | 274.24 | | |
| 1974 | 291.77 | | |
| 1975 | 299.07 | | |

Appendix table 1-Japan: Exchange rates

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Source: International Monetary Fund, International Financial Statistics, various monthly issues.

| Year | Wheat imports | | | | Share of wheat imports | | | | |
|------|-------------------|------------------|--------|-----------|------------------------|------------------|--------|-----------|------|
| | Total | United States | Canada | Australia | Other | United States | Canada | Australia | Othe |
| | 1,000 metric tons | | | | | Pere | cent | | |
| 1960 | 2,678 | 981 | 1,326 | 307 | 64 | 37 | 50 | 11 | 2 |
| 1961 | 2,631 | 798 | 1,459 | 355 | 19 | 30 | 55 | 13 | 1 |
| 1962 | 2,562 | 880 | 1,207 | 446 | 30 | 34 | 47 | 17 | 1 |
| 1963 | 3,178 | 1,452 | 1,303 | 382 | 41 | 46 | 41 | 12 | 1 |
| 1964 | 3,592 | 1,681 | 1,400 | 484 | 27 | 47 | 39 | 13 | 1 |
| 1965 | 3,645 | 1,971 | 1,249 | 422 | 3 | 54 | 34 | 12 | 0 |
| 1966 | 3,917 | 2,158 | 1,387 | 372 | 0 | 55 | 35 | 9 | 0 |
| 1967 | 4,130 | 2,186 | 1,436 | 507 | 1 | 53 | 35 | 12 | 0 |
| 1968 | 4,073 | 2,072 | 1,241 | 748 | 12 | 51 | 30 | 18 | 0 |
| 1969 | 4,328 | 1,986 | 1,015 | 1,245 | 82 | 46 | 23 | 29 | 2 |
| 1970 | 4,685 | 2,586 | 1,195 | 903 | 1 | 55 | 26 | 29 | 0 |
| 1971 | 4,872 | 2,563 | 1,246 | 1,063 | 0 | 53 | 26 | 22 | Û |
| 1972 | 5,148 | 2,545 | 1,236 | 1,367 | 0 | 49 | 24 | 27 | 0 |
| 1973 | 5,386 | 3,616 | 1,450 | 183 | 137 | 67 | 27 | 3 | 3 |
| 1974 | 5,377 | 3,025 | 1,488 | 830 | 34 | 56 | 28 | 15 | 1 |
| 1975 | 5,654 | 3,004 | 1,476 | 1,174 | 0 | 53 | 26 | 21 | 0 |

Appendix table 2-Japan: Wheat imports by country of origin

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Source: Japan Customs Bureau, Ministry of Finance.

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