THE WELFARE IMPACT OF JAPANESE AGRICULTURAL TRADE POLICY DISTORTIONS

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Section I: Introduction

While economists are nearly unanimous in their general opposition to protectionism, international trade seems to be a subject where the advice of economists is routinely disregarded.¹ The current World Trade Organization (WTO) Doha Round negotiations have come to a stalemate and worldwide persevering protectionism in the sensitive agricultural sector has made agriculture the most important and controversial issue in international trade negotiations of today. As the world’s largest food importer, Japan is well known for its high barriers to trade and for protecting its domestic farmers, which is reflected by high domestic food prices.

Section II: Hypothesis and methodology

The hypothesis of this research is: ‘Japanese agricultural trade policy distortions have a negative impact on domestic welfare’. The objectives of this study are (1) to estimate the welfare costs of Japanese agricultural trade policy distortions and (2) to briefly analyze and discuss Japanese agricultural policies. For the estimation of the costs of protection, the methodology from Bale and Greenshields (1977)² is replicated. By using a Corden/Johnson type partial equilibrium model the annual welfare costs of Japanese agricultural trade and production policies are estimated for the period between 1986 and 2007. The products under review are eight major cereal and livestock commodities produced and imported in Japan: wheat, rice, soybean, barley, milk, pork, chicken and beef.

This study is based on the Marshallian concept of economic surplus, which has been extensively used to quantify the impact of trade barriers such as: tariffs, quotas and production- and export subsidies. The basic formulae for calculating the net social loss in consumption (NSL_C) and the net social loss in production (NSL_P) of price distortion are given in equations (1) and (2), respectively:

\[ \text{NSL}_C = \frac{1}{2} (P_d - P_w)(Q_w - Q_d), \]
\[ \text{NSL}_P = \frac{1}{2} (P'_d - P'_w)(Q'_w - Q'_d) \]

where \( P_d \) = domestic retail price, \( P_w \) = world retail price, \( Q_d \) = domestic consumption at domestic prices, \( Q_w \) = domestic consumption if world price prevailed, \( P'_w \) = domestic producer price, \( P'_d \) = world producer price, \( Q'_w \) = domestic producer at domestic prices, and \( Q'_d \) = domestic production that would be forthcoming at world prices.

Table 1: Comparison of Japanese and world prices in 2007, yen per ton, and price elasticities.

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Commodity | Japanese price | World price | Price elasticities
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 | Producer | Retail | Producer | Retail | Producer | Consumer
Wheat | 119,950 | 119,950 | 38,694 | 38,694 | -0.16 | 1.61
Rice | 205,286 | 205,286 | 60,100 | 60,100 | -0.12 | 0.16
Soybean | 173,205 | 173,205 | 49,481 | 49,481 | -0.14 | 0.46
Barley | 100,480 | 100,480 | 54,246 | 54,246 | -0.51/-1.28 | 0.55
Milk | 77,651 | 520,000 | 39,322 | 263,327 | -1.00 | 0.43
Pork | 384,800 | 2,420,000 | 148,783 | 935,692 | -0.76 | 0.14
Chicken | 153,300 | 1,250,000 | 137,206 | 1,118,768 | -0.15 | 0.12
Beef | 868,489 | 8,840,000 | 627,068 | 6,382,671 | -0.80 | 0.66


Information required to perform the calculation are Japanese and world prices at both producer- and retail level, as well as estimates of supply and demand functions by commodity for Japan. These are displayed in Table 1. An attempt to estimate price elasticities using data of the last 22 years available did not provide significant results. Therefore, this study is forced to assume that the price elasticities from Bale and Greenshields (1977) still hold. These elasticities are utilized to approximate domestic consumption and production levels in a world price situation, while related against the differences in domestic and world price and domestic quantities.

Section III: Results and findings

An overview of the estimates is provided in Figure 1. The graph displays an accumulation of the net social consumer- and producer losses between 1986 and 2007. Several interesting observations can be made from the estimation of the welfare loss of Japanese agricultural trade policy distortions. For 2007, the welfare losses are the highest for the consumption of: milk, pork and beef, followed by the production and consumption of rice. Moreover, the accumulated welfare losses in consumption are much higher than the total welfare loss in production, indicating that the Japanese consumers/taxpayers are the ‘losers’ from agricultural trade policy distortions. The total net social welfare loss ranged between 3,667 billion Yen in 1997 up to 7,537 billion Yen in 1995. For the 22 years under review, the total estimated welfare loss averages at 5,041 billion Yen per year.

Figure 1: Overview of consumer and producer losses, 1986-2007.
Figure 2 illustrates the trend of the net social welfare loss expressed as a percentage of GDP and agricultural GDP. Between 1986 and 2007, the total welfare loss ranged between 0.73 per cent and 1.56 per cent of GDP, and the annual average of 5,041 billion Yen represents 1.05 per cent of GDP per year on average.

**Figure 2: Welfare loss expressed as percentage of GDP and Agricultural GDP.**

The severity of the suffered welfare loss imposed by Japanese agricultural trade policy distortions is elucidated when expressed in absolute numbers per capita, as shown in Figure 3. The welfare loss per capita ranged between 29,068 and 60,020 Yen or 208 and 638 US Dollars, which amounts to a yearly average of 40,119 Yen or 339 US Dollar for the period.

between 1986 and 2007. This value represented 3.09 per cent of total consumption expenditure in 2007. Because food expenditure accounted for 25.31 per cent of total average household consumption expenditure in 2007, the welfare loss amounted to 12.19 per cent of per capita food expenditure.

**Figure 3: Welfare loss per capita in Yen and US Dollar.**

![Graph showing welfare loss per capita in Yen and US Dollar]

*Note: Japan Population and US Dollar currency data obtained from OECD stat.; Dataset: Macroeconomic 1970-2016.*

The demand and supply elasticities employed in the estimation have been utilized to simulate changes in production and consumption if world prices prevailed. These approximated that total trade liberalization of the selected commodities would have resulted in an average additional consumption of 28 per cent of total value of Japanese food consumption, due to lower consumer prices. Increased competition from abroad would have declined domestic food production by an average of 53.5 per cent of its production value. These changes in production and consumption are displayed in Figure 4.

**Figure 4: Changes in production and consumption resulting from liberalization.**

![Graph showing changes in production and consumption]

*Note: Value of additional consumption is based on world opportunity price, while loss in production is based on value of existing domestic production.*
As can be seen in Figure 5, peaks and fluctuations in the trend of annual total welfare losses can be largely explained by the Yen-US Dollar exchange rate. The two trends have a significant correlation of 0.742. This suggests that welfare losses are larger in years when the Yen value is relatively strong against the US Dollar.

**Figure 5: Comparison of trends in total welfare loss and Yen-US Dollar exchange rate.**

Section IV: Japanese agricultural policies

The observation of the estimated welfare loss calls for trade liberalization of Japanese agriculture. However, several arguments for protection remain used in Japanese agricultural policy-making in order to meet society’s need of several economic-, social-, security-, and environmental policy objectives. Two of the main objectives of the Ministry of Agriculture, Forestry and Fishery’s policies are: income equality and food security.³

Table 3: Self-sufficiency in food production, 1960 – 2007

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*Note: Total self sufficiency is expressed on caloric base.*

*Source: Food Self-sufficiency report (FY 2008), MAFF*

As shown in Table 3, the food self-sufficiency of Japan has been continuously declining in the post-war era due to lower production and increased population. Japanese agricultural policy has set targets to increase the food self-sufficiency ratio for the sake of ‘food security’. However, instead of boosting domestic production with the use of heavy agricultural protection, food security might be achieved better by engaging in long term relations with main trading partners, with the use of free trade agreements. This would benefit the policy goals of ensuring food availability and creating price stability.

Table 4: Comparison of household income between non-farm and farm households.

Since the industrialization of Japan in the 1960’s, the productivity of the industrial sector rose rapidly compared to the agricultural sector and as such did labor wages. Ever since, a major objective of Japanese agricultural policy has been to fill the income gap between farmers and urban workers. However, Table 4 displays that income equality has already been achieved since the 1970’s and recent incomes of Japanese farm households are on average 23 per cent higher compared to non-farm households, while relying for ±85 per cent on non-farm incomes. These facts challenge Japanese agricultural policies that impose agricultural protection based on the income disparity argument. Instead of using agricultural policy, the urban-rural income disparity issue would be addressed better by the general tax and social security system.

Decoupled payments that target core farmers, consolidation of land as the aging farm population retire, and abolition of production quotas can alternatively lead to improvements in farm income.

Why are policies as they are? When considering the political economy of protection one would find that agricultural policies are not solely based on welfare considerations. Instead, policy creation is heavily influenced by lobbying activities, support-maximizing politicians and the political use of trade policy. Optimal policies to counter market imperfections are well known in literature. For example, a subsidy is mostly superior to a tariff. However, non-optimal policies are still widely preferred in order to conceal assistance to minority groups, because these are less obvious in use. Increased political transparency could lead to policies that maximize social welfare. As such, the two-party structure of current Japanese government should be resolved, since it is sensitive to populist policies.

Section V: Final statement

The hypothesis of this research: ‘Japanese agricultural trade policy distortions have a negative impact on domestic welfare’, is accepted. The estimates of net social welfare losses, as well as the review of Japanese agricultural policies that impose protectionist measures, provided convincing arguments that Japanese agricultural trade policy distortions do have a negative effect on domestic welfare.

4 Ibid., p.23
5 Ibid., p. 107