

THE POLITICAL AND ECONOMIC JUSTIFICATIONS OF RICE TRADE DISTORTIONS
IN THE UNITED STATES AND JAPAN.

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ABSTRACT

Rice is one of the most distorted commodities in the world. The United States and Japan both hold rice sector policies to that significantly protect their industries and distort trade. This study identifies major rice sector policies in the U.S. and Japan, and demonstrates their probable economic consequences in terms of social welfare. U.S. producers are major beneficiaries and Japanese consumers are at a major welfare loss. This study demonstrates the use of economic analysis as a tool in policy formulation. Change to these policies is not likely, unless drastic social/economic changes were to happen.

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Chapter 1

Govern:

-*verb*: to exercise continuous sovereign authority over; *especially* : to control and direct the making and administration of policy in

-Merriam Webster's

INTRODUCTION

National governments are independent authoritative bodies separated the borders of the world. Within these borders, governments are often broken down into bureaucratic legislative bodies overseeing smaller specific entities. They may govern small cities and counties all the way up to states and nations. In the realm of agricultural commodities, policies imposed by even one government can affect the sector as a whole. These political and economic rulings may be implemented for a number of purposes, but carry the potential to make a large impact within a nation and a considerable statement on behalf of a nation. Depending on the size and influence of a nation, prohibitive legislation can skew not only domestic, but also global market price, especially in the realm of agricultural commodities.

Rice policies established by nations stem from various rationalizations, and manifest themselves in different forms. Policies often reflect national attitudes or concerns. On a global scale, calories from rice account for 20 percent of total consumption (Kennedy and Koo, 2002). Because rice is such a basic world food item, policies related to it can carry special significance

to those in the developing world. Theoretically, to attain most efficient use of world resources, trade liberalization is the answer (Leamer, 1995). In an ideal fair trade environment, international boundaries would not exist and everyone could trade freely. A grain like rice could be traded with transport and insurance costs as the primary difference in market prices. For much of the developing world, this freedom would improve their economy and overall well-being. Trade could be limited largely on means of transit and perishability of the product.

Unfortunately, such a world does not exist. Borders are firmly established and nations seem constantly in flux – often disgruntled from past wounds, and facing the ever-changing political scene daily. The case of the 1990s rice embargo in Iran and Iraq is but one demonstration. The wartime mentality can adversely affect others and generally demonstrates how conflict can simply strain the flow of trade (Childs and Burdett, 2000). In another case trade liberalization and agreements are being developed even within muddled policy agendas. Signing of legislation by President Clinton in 1999 to eliminate unilateral embargoes demonstrates how sensitive an issue trade can be (Childs and Burdett, 2000). For non-agrarian economies the impacts will be less noticeable, but to the developing world, policies made by these more powerful countries can have a large effect

Based on Heckscher-Ohlin's theory of factor endowments (Leamer, 1995) many organizations or interest groups, such as the World Trade Organization WTO have emerged. These groups have set out to substantially and progressively reduce agricultural support and protection on both the small a large scale (McCalla, 2003). Most notably the WTO has become an interface on which member can dialogue. Ultimately, the question is how important WTO ideals are to a country. While this organization is established to motivate fair trade interactions and global market freedom, individual countries maintain substantial power to act independently,

setting the direction of their policy future. This freedom lends question to the current state of agricultural trade policy and why such significant political differences exist. Study of such case questions whether economics and policy are in opposition or if they can co-exist.

The USA and Japan are countries that historically exemplify diversity in rice trade policy and production levels. Converging over the years, production levels are now very similar (See Figure 1). Both the USA and Japan aim to support sustainable economic growth and have been members of the Organization for Economic Cooperation and Development (OECD) for near half a century (OECD, 2009). Each country comes from distinct agricultural background in rice production – evolving into their current state under the influence of governments and national voice. “Why governments tax or subsidize?” is one of the least understood questions by scholars and is a critical question for the world rice market (Gawande and Hoekman, 2009).

Research Question

Comparatively, what are the political economic justifications of rice trade distortions in the U.S. and Japan?

Objective

1. To determine major trade policy relevant to the rice sectors of The U.S. and Japan in the 21st Century.
2. To examine probable economic consequences.
3. To determine if policy change is possible.

Significance Of Study

A staple food in over half of the world, rice is an important energy source (USA Rice Federation, 2009). At the same time, among agricultural commodities it is the most distorted (FAO Staff, 2004(a)). It is both produced and consumed in every major continent, yet is mostly concentrated in Asia. Rice farming in Japan comprises 25 percent of the relatively small Japanese agricultural sector (Fukuda, Dyck and Stout, 2003). It carries rich cultural significance and is made up of numerous small-scale family operations. These operations value the ability for productivity in an expanding urban society. Japanese farmers seek to maintain traditional methods, avoiding the commercialization prevalent in America. Distorting policies such as subsidies and the Tariff Rate Quota (TRQ) drive the price of rice 10 times higher than it would be without them (Fukuda et al., 2003). Further it is one of the “most distorted of all agricultural commodities” (FAO Staff, 2004(a)). In contrast the passing of the 2002 Farm Bill in the United States followed by the 2008 Farm Bill firmly established streams of payments for producers. In the current Doha round of trade agreements it remains a sensitive issue, and will be decisive in the conclusion of the round (Durand-Morat and Wailes, 2006). The implications of how these policies change to benefit national or global interest will be telling may not have impact on the rice market. Comparison of these countries may give insight into trade “negotiations” (Kennedy and Koo, 2002) and policy formulation.

While numerous studies have been conducted to compute global distortion issues, a more pointed study on rice may be revealing. Looking at the differences between two exceptionally

distorted nations and one more moderate in its policy may help uncover factors in the rice industry as a whole. Why governments implement protectionist policies and what measures they choose to use has been a long-standing question. The U.S. and Japan are two nations with varying arable land, populace, consumer preferences and national interests. Arable land for rice production and natural supply and demand we see that the U.S. is a net producer who has found an export market in the Japanese commodity¹. This study will be of concern with those who grow, sell and trade rice as well as politicians who are involved in the agricultural sector. In light of World Trade negotiations that seek for transparency, it may also help to understand why powerful developed countries resist liberalization. It seeks examine economic and political conditions and generate dialogue on transferable concepts similar to patterns emerging in the “Nominal Rates of Assistance Model” (Gawande and Hoekman, 2009).

Because rice is such a critical grain for both developed and developing countries, the implications of a powerful nation’s policy will be paramount. Over 90 percent of production and consumption occurs in Asia in high-density nations such as China, India and Japan (Kennedy and Koo, 2002). Historically, the liberalization of trade has always been pioneered by large nations and will be a determinate to the state of many subservient nations. Because so much production is occurring within these consuming countries, the actions of the U.S. may not have a direct market price effect, however, the precedents set by their stance on trade will make a statement for other nations to either follow or dismiss (McCalla, 2003). As original members of the World Trade Organization their initial stance has set them towards on a path towards transparency and

¹ See Figure 2 for historical U.S. Japanese rice trade

the lowering of trade barriers. In response, each country's use of subsidies, tariffs and non-tariff barriers will prove the seriousness their commitment. The study of commodity trade between these countries runs into the bigger question of economics and politics. Are they in opposition or can they co-exist with meaningfully. The outcome of this study will give insight into this question.

Chapter 2

REVIEW OF LITERATURE

Formulated theory of trade has influenced government for nearly the last 200 years. From the 1776 mercantilist questioning *Wealth of Nations* (Smith, 1909) to current “New Trade Theory” (Krugman, 1991), understanding why and when countries should trade has been a prominent question for nations throughout trade history. Significantly, the 1930’s Hecksher-Ohlin model of factor endowments has given a reasonable framework by which to understand trade (Leamer, 1995). This model essentially states that a country will export factors in which it “endowed” with and import those of which it is scarce. These “factor endowments” include natural resources, labor, and capital. For the sake of study, these theories are based upon assumptions that aim to shed light upon reality, but have not been perfected as one might attain to in hard science. The establishment of an institution dedicated to policy issues such as U.S. International Trade Commission (ITC) speaks to this reality. As in all politics - a sizable gray area presents itself, and the weighing of what is fair often finds a resolution in compromise.

From 1947 to 1956, during the first four rounds of the General Agreement on Trade and Tariff (GATT), the issue of agricultural trade was seemingly avoided to appease the United States. The sensitivity and importance that has surrounded it is historic. Entering the Uruguay

Round of agreements, agriculture came into the spotlight once more. As now has become the norm, the round was delayed for four years, until its conclusion in 1994 – setting an expectation for not just domestic but also international consideration in trade. This international perspective has embedded itself into the doctrine of the World Trade Organization (WTO) the successive association to GATT. A predecessor to the WTO, the GATT was established following World War II after attempt to form an international trade organization (ITO) failed because the U.S. was unwilling to discuss quotas in agricultural trade. The compromise coming out of this was the GATT and it was not until 39 years later in the Uruguay Round that the issue was directly confronted (McCalla, 2003).

Newly established policy sets precedent for agricultural trade in the areas of market access, domestic support and export assistance. Market access was to reduce tariffs by more than one-third in six years. The implementation of domestic support programs were to be reduced by one-fifth and were to be calculated for the world to see by the United State Department of Agriculture's (USDA's) aggregate measure of support (AMS)². This former system combines support measures for all commodities into one overall measure (ERS Staff, 2009).

The domestic support system was broken down into three categories. A “Green Box” for non-distorting assistance, a “Blue Box” for de-coupling of production and direct payments, and an “Amber Box” for all other distortions, which were to be reduced if not done away with. Beyond the box system, triage of export subsidies were to be similarly curbed in attempts to halt

² <http://www.ers.usda.gov/Briefing/wto/domsupport.htm>

dumping³. Ultimately, the goal of all these was to unveil distortions in hope of liberalizing world markets; to stimulate economic interaction and help less developed countries. This makes best use of the worlds resources; however, to what extent this has happened remains in question (McCalla, 2003).

An industrialized nation like Japan maintains numerous tariff and non-tariff barriers in the agricultural sector (USTR Staff, 2009). Only a little smaller than California in physical size, Japan has only around 15 percent of its land available for farming with a population nearly half the entire size of the USA (Cramer, Hansen and Wailes, 1999). In 2008, they held a net trade surplus of \$72.7 billion above the U.S., and are within the top five exporting markets for the U.S. (USTR Staff, 2009). A major rice consumer, they are interested primarily high quality, medium-grain “Japonica” rice (Cramer, et al., 1999). In the 1950s arable land for rice production was divided into small parcels for personal “household” farming (Fukuda, et al., 2003), many of which still exist. Each year the government predicts domestic consumption and estimated amounts of land needed for production, but if producers do not conform they are not eligible to receive these payments (CERI Staff, 2007).

Japan has resisted imports for over 30 years, yet it was not until the conclusion of the Uruguay Round of Agreement on Agriculture (URAA) that Japan lifted its near complete ban on agriculture (Cramer, et al., 1999). Keeping in line with protectionist attitude, much of this rice is routed to not compete with Japanese fresh market rice (Fukuda, et al., 2003). Other non-tariff barriers include strict standards for pesticide and veterinary drug residues (CERI Staff, 2007) and

³ The selling of goods in quantity at below market price – Merriam Webster’s

market price variability, which is uncertain due to weather (Sanchez-Marco, 1994). In attempt to maintain control, the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) exclusively holds rights to rice imports within the TRQ. Based upon URAA, Japan is set at an import minimum of 682,000 tons, around 6.4 percent of the base year's consumption (Dyck, et al., 1999).

Founded upon capitalism and free market practice, the United States of America has a history of free market enterprise and a positive trade balance in agriculture. Of this balance rice is a significant contributor (USA Rice Federation, 2009). With near 2.7 million acres produced annually, about half are exported. In accordance with Figure 1, this makes sense. Domestic consumption is near half of production therefore surplus can be added to stocks or exported.

The U.S. is a Member in multiple regional free trade agreements. Significantly much trade happens with neighbors via establishment of the 1989 Canadian United States Free Trade Agreement (CUSTA) the 1994 North American Free Trade Agreement (NAFTA), which is a trilateral trade agreement between the USA, Mexico and Canada. These agreements exist to promote trade and economic integration. They aim to avoid relationships arising out of normal economic pressure to the benefit of themselves and their partners (Kennedy and Koo, 2002). In 1998 The USA began supplying *ad hoc* payments to farmers based on historical prices (McCalla, 2003). Those prices were made practically permanent by the 2002 USA Farm Bill, and continue to remain an influence in the commodity market domestically and internationally. Establishment of the 2008 USA Farm Bill continued subsidization via counter-cyclical payments, direct payments and marketing assistance loans, but also features a program that is revenue based rather

than on market price (Harwood, 2009). Since 1995 no export subsidies have been used (Kennedy and Koo, 2002). In the eyes of some, Farm Bill legislation has made the U.S. a hypocrite by promoting trade liberalization on one hand, yet utilizing elusive means of support to promote personal interests (McCalla, 2003).

Political pressure from interest groups or lobbyists within a country can significantly direct matters of trade. Hansen and Prusa (1997) found political pressure to play a significant role in determining International Trade Commission (ITC) decisions. The ITC is an independent government “quazi-agency” who specifically investigates matters of trade, analyzing trade data to provide the office of the USTR and policymakers with objective information (USITC, 2009). Hansen and Prusa (1997) revealed that representatives from important international trade subcommittees who are tied to a particular industry might have policies slanted towards their own interests. This study also demonstrated that monetary support by Political Action Committees (PACs) to pressure ITC decisions are more motivated by politics more than economics.

Distortions to trade can manifest themselves in numerous ways for varying purposes. The basic concept of government intervention can be viewed either from within or without a countries production. The controlling factor is that of production. Both tariffs and subsidies have power to impact supply measures. Ultimately both domestic and international producers and consumers can be impacted by these changes to supply. Another incentive can be government revenue. Import taxes or tariffs have the ability to simultaneously protect domestic constituencies and generate government revenue (Gawande and Hoekman, 2009). Farmers or

producers tend to support domestic interests more directly through subsidies, which often consist of payment programs. Other market distorting factors are known as Non-Tariff Barriers (NTBs). They can often take the form of “Quantitative Restrictions” (QRs). Common QRs are: variable levies, quotas, prohibitions, licensing requirements and state trading (McCalla, 2003). The variable forms are seemingly endless depending on what each nation decides to require.

Historically, monetary significance of policies has been an area of study, and remains relevant for politicians today. Many recent models such as Anderson and Valenzuela’s (2008) Nominal Rates of Assistance (NRA), and OECD’s Producer Support Estimate (PSE) attempt to accurately capture what is happening in the changing world of trade policy. It should be noted that these models are not always correct, and are not intended to be so. Rather quantitative models are expected to show relative significance and general direction of policy effects in the market (FAO Staff, 2004(a)). Strangely enough, quantifying policies theoretically and empirically has largely fallen short of impacting policymakers, particularly in the realm of agricultural trade legislation (Gawande and Hoekman, 2009).

Numerous methods have been developed to quantify these distortions, however with specific insight into the question of motive, the new Nominal Rates of Assistance (NRA) database by Anderson and Valenzuela (2008) calculates the effect of a number of instruments used to regulate agricultural trade. This study looks at 64 countries over the past five decades, giving both current and historical perspective to policy. Sample results can be identified in Figures 3 and 4. These box and whisker plots show NRA in relation to exports and imports on applicable commodities. This study compares and contrasts current production, consumption

and trade data to reveal potential trends.

All of these methods and more can be combined not only for agricultural purposes, but may also be leveraged as a foreign policy tool. As recently observed in the U.S. October 2008 Regulatory Reform Initiative between the U.S. and Japan, scrutiny of how and why and to what extent a country is infringing upon the free trade environment can create conflict. In this initiative, for example, the USA is demanding more transparency in trade-related rules and regulations (USTR Staff, 2009). Unfair political action in one commercial arena may result in retaliatory action in agricultural trade or vice versa.

In response, models of consumer and producer effects have been developed. Notably, *The Theory of Domestic Divergences* (Corden, 1997) demonstrates how difference in private and social costs can prompt government intervention. Corden discusses the appropriate application of tariffs and subsidies assuming many ideal market conditions. Ultimately these ideal models lend reference to the 21st century reality that commodity programs and the like are not in line with economics need. Congress has seemingly ignored the new Ag paradigm that seeks efficiency and more benefit to people and natural resources (Tweeten and Thompson, 2002). The current Policy environment demonstrates a system of economic policy run by politics, not economics.

Chapter 3

METHODOLOGY

Narrowing a complex topic into more tangible parts, the aim of this study is to examine each economically significant rice policy and its distinguishing characteristics. Each policy will be identified by respective government sources. The current policy configurations will then be viewed graphically through the lens of *The Theory of Domestic Divergence* (Corden, 1997). After this simple welfare analysis will be developed graphically to demonstrate the effects of current policy structure. Beyond theoretical analysis, a reputable measure of support known as Producer Support Estimate (PSE) will be input into a model. This model will be adjusted according to given USDA ERS demand elasticities⁴ to simulate the impact of these protectionist measures and what would happen if they were to be loosened. The model will incorporate recent market prices from private research sources in both the U.S. and Japan⁵ and take the average price of Japanese varieties. These figures and models derived from this analysis will lend reference to which policies are of significance in the rice sector.

To identify major trade distorting policies government and international authorities will be

⁴ Available at: <http://www.ers.usda.gov/Data/elasticities/>

⁵ U.S. and Japan: www.mediumgrainrice.com; www.japan-rice.com/market-price.htm

utilized. Provided by the USDA are relevant trade briefs open to the public through the USDA's ERS. From there I will define the Japanese tariff system in detail through a technical report on the quota system (Skully, 2001). For the United States I will look to commodity research by Coats (2008) for specifics on the effects of the 2008 U.S. Farm Bill. The specific policies will be defined in terms of the ERS 2008 Farm Bill Glossary (ERS Farm Policy Staff, 2009). Lastly, the question of whether change is possible will be addressed, taking into account the above findings and current social and political state of rice.

A distinguished source for data series analysis is compiled by the OECD in their PSE measure (Fukuda, et al., 2003). In Japan, from 1995 to 1997 these figures of distortion used to be calculated and reported by the MAFF in a measure called Aggregate Measure of Support (AMS), however after 1997 there was reform in Japanese policy and the AMS was done away with. The WTO now measures trade distorting government support by the OECD's PSE system. These support estimates take into account market transfer to consumers from taxpayers and budgetary transfers to give an overall estimate of market price support for commodities (OCED, 2009). This database ranges from 1986 to 2008 and includes reports from Japan and the U.S., which are both participating member countries. The model I develop will utilize producer single commodity transfer percent (PSCT), a sub category of PSE to show specific rice transfers over the value of receipts from rice production. These country figures are readily available at no cost through the PSE database on the OECD web site, downloadable in Excel format⁶.

⁶ OECD Producer Support Database: www.oecd.org/agriculture/pse

Assumptions and limitations

Some main assumptions will be applied and loosened throughout the analysis. Notably, Corden's theory of Domestic Divergence will be employed and the ensuing limitations. While these assumptions will not be discussed in depth, they will be listed here for reference. (1) Subsidies can be financed by taxes that are nondistorting. (2) There are collection costs in taxation. (3) There are no costs of disbursement of subsidies. (4) The income distribution effects of various policies can be neglected. For more specifics on the stipulations of such welfare assumptions see Corden (1997) chapter 3: *The Four Assumptions of the Theory of Domestic Divergences*.

Chapter 4

DEVELOPMENT OF THE STUDY

Most domestic support policies are influential over production decisions a farmer makes (FAO Staff, 2004(b)). Because of this there is always potential to distort trade. To find specific policies distorting trade for Japan I looked at the USTR's yearly trade barriers report and the PSE database. From here I found that support program information for each country to be traced back to their respective national agricultural departments. For the U.S. this could be found the USDA's ERS system by simply typing "rice policies" in the search field of the site⁷. For Japan, because their MAFF website is not completely translated to English, it was more accessible to rely other trade sources. Notably the USTR provides an annual report on trade barriers with detailed analysis of 62 countries. I also gleaned from other studies such as Fukuda et al. (2003).

Explaining these policies, adept definitions are given by the ERS in accord with 2008 Farm Bill legislation (ERS Policy Staff, 2008). The first notable policy is that of market assistance loans and loan deficiency payments (Childs and Baldwin, 2008). This program offers producers nonrecourse commodity loans marketing loan provisions at rates that are less than the given loan rate. By setting the commodity as collateral the loans provide financing as participants

⁷ ERS Briefing Rooms: *Rice Policy*. <http://www.ers.usda.gov/briefing/rice/policy.htm>

may forfeit their crop in event of a loss. The loan rate is set by legislation and is currently \$6.50 per hundredweight (cwt) for crop years 2008-12. Normally the loan period is 9 months, at the end of which producers can either pay off the loan and interest or transfer ownership to the government to fully settle accounts with no penalty (ERS Policy Staff, 2008). The Marketing Loan comes into effect when either the world price or loan repayment rate is below the loan rate, providing even more incentive to farmers and reducing risk. No limits exist on marketing loan payments. This program aims to lower risk for producers and ease market entrance, and can be especially advantageous for smaller producers.

Another U.S. subsidy measure to supply stability and farm income are Direct and Counter-Cyclical Payments (Childs and Baldwin, 2008). Participants in the program are eligible landowners and producers with historical production for at least 4 years (between 2003-06). They must annually agree with the USDA to receive payments. Direct payments (DPs) are made at a fixed rate set in the 2008 farm bill at \$2.35 per cwt. To those with eligible historical production, counter-cyclical payments (CCPs) are available. They are based on a unit price level of sale. These payments are made to producers whenever a commodity's target price is greater than its official USDA effective price. For the crop years 2008-12, the target price for both medium and long-grain rice in the U.S. is \$10.50 per cwt, while the actual market price for medium-grain is \$21 per cwt (Mediumgrainrice.com, 2010). According to the 2008 Farm Act, payments are limited to \$40,000 for DPs and \$65,000 for CCPs per year. While direct trade distortions do affect trade, it is questionable as to the exact effects of decoupled payments (FAO Staff, 2004(b)).

Lastly, since the passing of the 2008 Farm Bill the U.S. has introduced the average crop revenue election program (ACRE). The ACRE program is a CCP program that is revenue based and is an alternative normal historically based CCPs (Childs and Baldwin, 2008). There are some stipulations however whereby participants face reduced direct payments and market loan rates that are lower. It sets up State guarantee and a farm benchmark per acre figures. If the actual State revenue per acre or farm revenue per planted acre falls below the stated price payments are made.

In Japan the main inhibitor of free rice trade is the TRQ (Fukuda et al. (2003); USTR Staff (2009)). Established in 1999, the TRQ allows approximately 682,000 metric tons (milled basis) of imports into the country (USTR Staff, 2009). In 2007 the U.S share of these exports were approximately \$206 million, representing around 322,000 metric tons and almost half of the Japanese import market. The configuration of this tariff is *ad valorem*. *Ad valorem* tariffs are:

A two-tiered tariff structure that was established in the Uruguay Round by certain countries for a subset of their imported items ... expressed as in-quota tariffs and over-quota tariffs. The lower, in-quota tariff is the rate levied on imports up to a certain quantity level. The higher, over-quota tariff is the rate levied on imports in excess of the quota volume (ERS Policy Staff, 2008).

Figure 5 aptly displays this tariff in action showing the levels of production in relation to the above tariff levels and the rent paid by importers for going over the allowed quota level. As seen in Figure 1, in 2008 the Japanese consumed slightly more than they produced at about 4.5 percent. Of total consumption figures the U.S. allotment accounts for about 3.5% of Japanese production (OECD PSE, 2009). These shares are allotted by the Japanese Staple Food Department (SFD) to countries on a yearly basis through a simultaneous-buy-sell system (SBS)

(USA Rice Federation Staff, 2008). This system assigns public tenders to the Japanese table rice market (medium/short grain), giving preferential treatment to Japanese trading companies and rice mills, creating a mark-up on the rice equal to the difference between the Japanese wholesale price and that of imports. Of the 322,000 tons reaching the Japanese market only small amounts reached Japanese homes labeled as “U.S. rice” (USTR Staff, 2009). The move of Japan to the TRQ may be more transparent or liberal in the sense that it does not technically limit the import quantities as a true quota would (Skully, 2001), however the over quota tariff rate of \$2,819/ton (2001) stifles any substantial imports (Fukuda, 2003).

Interaction between the U.S. and Japanese markets and policy measures are primarily the result of U.S. domestic support programs as listed above and Japanese tariffication. Policy measures by the U.S. and Japan make result in net exports for the U.S. and a small percentage of imports for the Japanese. Figure 6 roughly demonstrates the two markets and their interaction in light of export supply and import demand.

Probable Economic Consequences

Effects of the stated policy measures may be difficult to quantify, however generalizations can be made. According to FAO Staff (2004(a)), comparing 9 different price equilibrium models, the difficulty with quantitative models is taking into consideration special features of the rice market. In this study we will examine basic welfare effects of tariffs and subsidies as well as a partial equilibrium model. Understanding who benefits and loses as a result of policy measures will shed relevant light on how each country justifies its position.

Viewing U.S. and Japanese policy by The Theory of Domestic Divergences (Corden,

1997) helps define what the probable economic consequences are and how tariffs and subsidies work. According to the nature of the agricultural commodity industry, policy measures are made to most directly affect supply. Looking at the optimum subsidy model in Figure 7 we see the case of the U.S. subsidy programs with GG' representing the marginal private costs of production and HH' the marginal social costs of production. Effectively HH' tells us output with U.S. subsidies (all three major programs) in place and marginal private cost in our case can be defined as the cost that U.S. rice producers must produce at a higher price (lower volume) to maintain profitability in the world market. At this point there is more benefit to domestic consumers than producers. Curve DD' is Japanese demand for rice. Comparing production levels OA to OC we can see greater Japanese demands met as well as well as US production increases. Ideally this measure should not alter the level of foreign consumption, but rather will protect U.S. rice growers by incentivizing increased output. The social welfare gain to this figure is NKL while the social welfare costs to US public are $AKLC$. In other terms this can be considered the amount of dead weight loss (DWL). Deadweight loss is a loss of social welfare due to a government policy (or market failure) that cannot be recaptured by the economy. It indicates a lack of efficient use of resources whether land, labor or capital. In review the optimum subsidy affects production through the use of production incentive to directly increase farm income. A subsidy only indirectly affects competition by raising quantity and lowering prices, it does not have direct effect on foreign import price.

In Contrast Figure 8 shows the more dynamic impacts of a tariff. In this case we consider G to be U.S. marginal supply and H to be Japanese social costs with at tariff in place from SP/OP . DD' is once again Japanese domestic demand. The tariff protects Japanese producers from foreign competition by decreasing foreign access, raising import prices to a level that

decreases domestic demand. The change in domestic demand is noted by the shaded area EFQ and is another area of DWL. The responsiveness of this measure is dependent upon the elasticity of demand for rice, which in both the US and Japan is rather inelastic (-.11 and -.13 respectively⁸). Assuming the many factors that Corden has set as constant in these models, the most notable issue that arises in comparison is that of “by-product distortion” (Corden, 1997). Because of the world price (PP’) which reflects lower market costs due to imports there is a “marginal divergence” between marginal private costs of production and social cost. The tariff seeks to eliminate a divergence between private and social costs by effectively limiting foreign import supply to drive domestic costs up. Because of this the consumer loss area of EFQ arises. This occurrence can also be called the consumption effect. This is less ideal than a subsidy. Dissimilarly a subsidy does not limit supply, but rather provides incentive and stability towards increased production.

The Case of Japan may prove different than other theoretical models. The probable reasoning for using a tariff rate quota instead of a subsidy is that of control. Over 80 percent of the quota is filled by the MAFF food agency under the label of “Ordinary Market Access”. The rest of the shares in the quota are filled in a “simultaneous-Buy-Sell” (SBS) format to private traders in auctions (FAO Staff, 2004(a)). Because the market price of medium-grain rice is approximately 550 percent higher (Childs and Baldwin, 2010) than the world price is at, 21 dollars per cwt (Mediumgrainrice Staff, 2010).

Figure 9 is a very basic economic welfare model of the US production in relation to the Japanese market condition. The main impediment and determining factor in the trade market is the TRQ. This model demonstrates the effects of the TRQ with respect to Japanese market

⁸ Source: USDA ERS Data Sets 2009: Japan – *Bread and Cereal Own Price*; U.S. - *Rice*

supply and demand. The kink shown at point A is where the second tier of the tariff goes up to restrictive levels. The Line BB' is market response if Japan was to eliminate the TRQ and the U.S. were to keep current policy measures. In response, theoretically Japanese demand for cheaper imported rice is going to increase, including U.S. medium-grain rice. The shaded area is the amount of potential gain for U.S. producer/Japanese consumers.

Breaking the model down into consumer and producer welfare we see that the most significant winners are Japanese consumers. These consumers, who maintain consistent demand for quality Japonica medium-grain rice can have their demands met at drastically lower costs (approximately 3x). Another factor to note is that the current \$36 U.S. per cwt market price for medium-grain rice is under the influence of this tariff and would subsequently drop lower given the end of the TRQ. Lower demands and higher prices from the by-product distortion effect would be undone and price would fall as Japanese consumption increased. In effect, the loosening of the TRQ would not only lower costs by the *ad valorem* amount, but would create a market shock that causes domestic producers respond in trying to compete with such low prices.

Japanese producers are undercut by huge foreign farms and are the losers in this scenario. Small scale farming on scarce agricultural lands allotted by the MAFF will not prove profitable enough to maintain. Ultimately Japanese producers are the losing party in the equation. Unless Japanese farmers consolidate and commercialize they will likely not be able to out compete foreign competitors. This is some key reasoning for government intervention.

US producers have the potential to more easily produce rice at lower costs and higher volume. This is largely due to the commercialization of the US agricultural system. In the Sacramento Valley of California irrigation infrastructure as well as large-scale rice cooperatives have targeted aims on excess production. In the case that only the TRQ were lowered,

Californian commercial producers would be highly incentivized by direct payments to increase production to undercut Japanese (and other foreign) producers. On the U.S. side, these producers would be the winners. If the TRQ of 322,000 metric tons of rice allotted to the U.S. represents \$206 million (USTR Staff, 2009) then other 360,000 (682,000-322,000) remaining tons would represent approximately \$230 million more available for commerce. Beyond loosening of the constraint, there would be increased demand for lower priced imports by the amount of the by-product distortion affect. This would expand U.S. export market to Japan significantly.

As reviewed previously, the elasticity of US consumer demand is largely inelastic. U.S. consumers, if at all, have a marginal increase in social welfare. This increase would be in response to the increased production of medium-grain rice and subsequent lower prices. Johnson (1987) coins the US agricultural condition as “excess capacity.” Contrasting U.S. production and consumption versus Japanese in Figure 1 we see a large discrepancy in the amount produced versus consumed. Also, to be considered in this figure is the fact that medium-grain varieties account for 19 percent of U.S. production where as around 80 percent is long-grain (Boriss and Huntrod, 2009). Excess capacity can lead to surplus stocks and prices below market price. In worst-case scenarios the product is seemingly and literally dumped upon the world market (Johnson, 1987). At best the capacity keeps domestic production levels stable and only affects countries that would profit from trade with the U.S. All in all, U.S. consumers have a slightly advantageous position due to U.S. policy measures resulting in lower prices and would marginally benefit from the opening of the Japanese market with a potential for even lower U.S. market prices.

For the sake of demonstration, Figure 9 shows potential gains to U.S. producers in event of TRQ liberalization, however this assumption is very improbable. It is unrealistic for the U.S.

to be granted full access to the Japanese market as it would show great preference to the U.S. amongst the world market and make them disproportionately dependent upon the U.S. This falls in line with the classical argument for protectionism whereby economics do not determine political decisions ultimately, but rather political interests. That is the government is willing to take a loss in *net social welfare*⁹ for the sake of political interest. In the case of Japan, dependence upon outsiders for such an important food source is not a commendable governing practice – therefore policy measures are reasonable.

To quantitatively assess the welfare affects of the TRQ on Japan the following model was devised (Figure 10). To calculate the impacts of the TRQ on the Japanese market price I retrieved the percent producer single commodity transfer (PSCT) from the OECD PSE database. From here I multiplied the current Japanese market price by the PSCT and the given demand elasticity to receive the adjusted price of \$30.58 per cwt. The world market price of medium grain rice is also represented graphically at \$21 per cwt. QS is given at 9,221 thousand tons and QD is given at 9,903 thousand tons. A long run supply elasticity of 1.173 is estimated by Tsujii using data from 1951 to 1969 that does not include the Acreage Reduction Program (ARP) and lends greater accuracy in light of the PSE measure (Nobuhiro and Kaiser, 1999). Given this information the following calculations were made:

i.) Quantity Supplied:

$$\% \text{ Change in Price: } -376\%$$

$$\% \text{ change in QS} = -3.76 * 1.173 = -441\%$$

$$\text{Since } QS' - QS / 0.5 * (QS + QS') = -4.41$$

$$QS' = -1.205 * QS / 3.205 = -1.205 * 115 / 3.205 = -43.24 \text{ thousand tons}$$

ii.) Quantity Demanded:

⁹ The combination of both consumer and producer welfare

$$\begin{aligned}\% \text{ Change in QD} &= -3.76\% \cdot .13 = .489 \\ \text{Since } QD' - QD / 0.5 \cdot (QD + QD') &= .489 \\ QD' &= 1.245 \cdot QD / .756 = 1.245 \cdot 9221 / .756 = 15,185.38 \text{ thousand tons}\end{aligned}$$

iii.) Quantity Imported:

$$\begin{aligned}Q^{IM} &= 9,903 - 9,221 = 682 \text{ thousand tons} \\ Q'^{IM} &= 15,185.38 - 43.24 = 15,228.62 \text{ thousand tons} \\ Q'^{IM} &= 15,228.62 - 682 = \text{imports increase by } 14,546.62 \text{ thousand tons}\end{aligned}$$

iv.) Producer Loss: a

$$(\$115 - \$30.58) \cdot 43.24 + 0.5 \cdot (\$115 - \$30.58) \cdot (9,221 - 43.24) = \$394,694$$

v.) Consumer Gain: a+b+c+d

$$(\$115 - \$30.58) \cdot 9,903 + 0.5 \cdot (\$115 - \$30.58) \cdot (15,185.38 - 9,903) = \$1,058,980$$

vi.) Government Surplus:

$$\begin{aligned}\text{World Price} &= \$21 \text{ per cwt} \\ \text{Before tax reduction: } e+f+g &= 682 \cdot (\$115 - \$21) = \$64,108 \\ \text{After tax reduction: } e+f+g &= -43.24 - 15,185.38 \cdot (30.58 - 21) = \$145,890 \\ \text{Government surplus change: } e+g-c &= \$145,890 - \$64,108 = \$81,782\end{aligned}$$

vii.) Net Social Gain: Consumer gain + government surplus – producer loss

$$\$1,058,980 + \$81,782 - \$394,694 = \$746,068$$

In summary we see a significant percentage change in price (376%) and drastic shifts in quantity supplied to unrealistic levels (-43.24). Net gain in social welfare is the sizable figure of \$746,068. Notably, upon relaxation of the tariff producers lose area a (\$394,694), while consumers gain areas a, b, c, and d (\$1,058,980). Viewed from an inverse viewpoint area a can be seen as the amount gained by producers, as consumers suffer the greatest loss from the policy measure. Ultimately the reason such a large loss of social welfare is feasible in Japan is because

costs are spread amongst such a large population.

In a similar manner the U.S. price for rice was calculated according to PSCT¹⁰ and the given demand elasticity. Figure 12 compares these prices graphically. Comparatively the percent change in price U.S. support and the Japanese are 125% and 376%. The figures lend reference to affirm the disproportionate effects of U.S. policy measure to support U.S. producers and Japanese policy to support producers. In this case percentage change in price can also be considered a relative measure of importance to producers.

According to Corden's theory of Domestic Divergence, Japan's use of a Tariff rate quota system is second best. Explanations of their use of a tariff over a subsidy may be in response to global pressure to be transparent in policymaking following the push for global reform concluding the Uruguay round. In agreement with the Corden's marginal divergence and the optimum subsidy, the subsidized structure of the United States makes sense. Conversely it is not difficult to understand the widespread use of tariffs and quotas such as Japan's in preference to subsidies. As Corden (1997) explains "protection unnoticed is protection more secure." The prospective impact upon Japanese producer welfare, as illustrated by these graphs, reveals necessity of some government support for the existence of the market.

The Possibility of Change

The possibility of change in Japanese protective policy is slight. Japanese industries each fall under a ministerial bureau called a *genkyouku*. These bodies collaborate with officials from industry, seeking to stabilize markets. Advanced industries such as automobiles, shipbuilding

¹⁰ See Figure 11 for historical PSCT comparison

and electrical equipment have arisen out of these markets. A chief aim is to, “prevent excessive competition” (Komiya, 1999). While this has been most prevalent in the industrial sector, the same *genkyoku*, philosophy and practice seem to hold their same aim in the rice sector.

If dissolution of the TRQ were to happen, tariff reduction similar to those in Cramer et al. (1999) may prove feasible. This study offers alternative tariff levels and rates of tariff reduction for these two countries' domestic market and the international market of rice over time. Another possibility is for increased productivity increases in production through farm enlargement (Johnson, Hemmi and Lardinois, 1985). If imports of rice were liberalized producer prices would decline by 77 % -- there would be almost no producer of these products who could compete at these low prices. About 18 percent of the cost of rice production is land rent (Johnson et al. 1985).

The U.S 2002 establishment of counter-cyclical payments encourages high capacity nearly guarantees high supply levels; therefore the possibility of change is minor. A reasoning backing this may be the mentality of industrialized countries to stabilize what would otherwise be a volatile domestic commodity price in the short run via price floors (Rausser, 1999). Unless drastic changes were to come to the U.S. agricultural political mentality and farmer demands, change is unlikely. Average government spending on rice subsidization between 1995 and 2006 were 1 billion dollars (Environmental Working Group Staff, 2009). As part of the total U.S. budget in 2007 agricultural subsidies represent only 0.52 percent of spending¹¹ at 13.4 billion. If change were to actually occur, the most effective measures would be mandatory supply control programs (Johnson, 1987). There would however be an inevitable propensity to set crop acreages and quotas too high. Farmers would demand high quotas and acreages and potential for conflict

¹¹ <http://www.whitehouse.gov/omb/budget/historicals/> ; <http://farm.ewg.org/farm/summary.php>

between producers and government would be great.

Worldwide effects of such distortions have implications for moderate impact on the world market. For developing countries the impact could be greater. This is especially with consumption in Asia and Africa. With near 20 percent of the population relying on rice as a staple food currently, its necessity will be greater as world population increases. According to census bureau projections, another 2.5 billion people will be alive and in need of food in 40 years (U.S. Census Bureau Staff. 1999) with a good portion of that being in Asia. Nevertheless the world market for rice may become even more important. In relation, protectionist policy on rice by nations will lead to difficulty in arguing for more trade liberalization in other markets with the WTO (Cramer et al. 1999) and the best use of national factor endowments.

Along with population, the relative rice farm sizes in the U.S. and Japan are drastically different. Japan has nearly three million producers (Kobayashi, 1999). Most Japanese producers are managing very small-scale operations with and look to other non-farm activities as a main source of income (Johnson, Hemmi and Lardinois, 1985). Furthermore, many of these farmers do not have successors to continue cultivation of the land. If the currently larger producers were to see this and make a point to develop larger scale operations, the opportunity for productivity is great.

Looking at the arguments for and against free rice trade gives a glimpse into the complex nature of trade policy. Because it is such a hot button issue in both its relation to impacts on the world economy and domestic interests, a range of measures have been applied to calculate its impacts. Different means of calculation are not used as the sole determinants of policy, but rather are to be considered guiding tools for policy makers (FAO Staff, 2004(a)) as they navigate the ever-changing waters of governance. Commodity trade has the power bring or detract economic

and social well-being to countries. If the policies of the U.S. and Japan were not in place the existence of domestic production would likely cease and be outsourced. As developed countries such as the U.S. and Japan face evolving national and global interests it will be a wonder to see where trade on this commodity as well as others changes or stays the same. Ultimately, it is the decision of government as to what the direction of a nation will be in terms of trade policy.

While economics play an important role in informing the current political situation, it is a desire for producer welfare and domestic production that sustains the rice sectors in these countries.

Chapter 5

SUMMARY

Justifications for current policy in the rice sector are theoretically based upon the fact that if these policies were not in place there would be little incentive for domestic production and it would likely cease. Primary rice trade distorting policies within the U.S. and Japan are as follows: The U.S. marketing assistance loans and deficiency payments, direct and counter cyclical payments and average crop revenue election; Japan: the tariff rate quota. Economic welfare analysis shows the impacts of these policies to be drastic in each respective economy. In the U.S., producers are major beneficiaries of the subsidy programs while Japanese consumers suffer great welfare loss due to the TRQ. The possibility of change is slight in each of these countries, however increase in population in the long run may increase global demand and the use of most efficient use of global resources. The use of quantitative analysis and economic modeling in this field shows that economic ideals and political reality differ. Economics are subservient to policy and are meant to be used as a tool for political decision-making.

CONCLUSION

The justification of trade distortions in the U.S. and Japan are a complex matters, however primary concerns are producer welfare, protectionism, and the loss of domestic production if the policies were not in place. For the U.S., direct producer supports incentivize growers to remain in production, stabilizing domestic production and providing excess supply for export. For Japan the protectionist tariffication stands in place to uphold domestic production on the scarce available agricultural lands. This measure also goes to support issues of national security for the staple food of Japan. In comparison the U.S. has ample land factor endowments to promote the supply beyond current levels. The action of each country in distorting trade through policy measures is reasonable to assure the continuance of rice production. Analysis of these two countries shows the relative importance of policy measures. It demonstrates what should be, and can be a valuable tool in policy making. It reveals a world where politics “triumph” over sound economics in two large developed nations (Tweeten and Thompson, 2002)

RECOMMENDATIONS

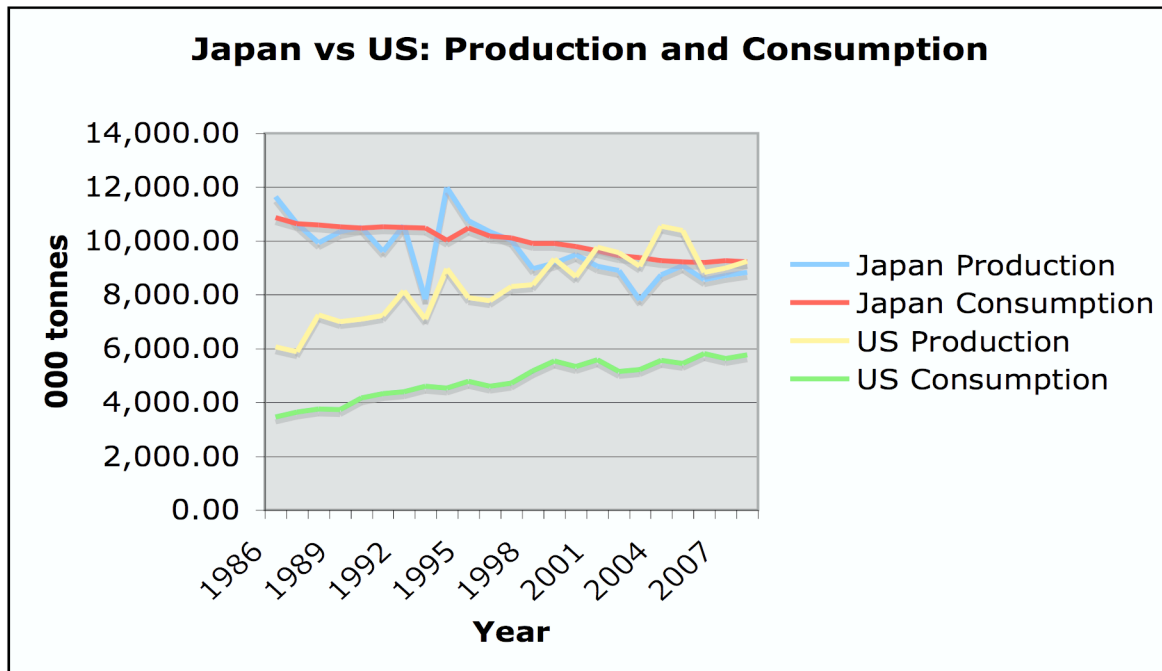
If one was to take analysis further, greater quantitative accuracy could be reached. A major source of error in the PSE adjustment models I developed is that discontinuity between medium and long-grain rice markets. PSE figures, as well as most US production estimates, are not given accurately because they are not divided by variety. The Arkansas Global Rice Model

(AGRM) is a study worthy of reference and application in this area. It breaks down commodities by variety, which is more representative of international trade (FAO Staff, 2004(a)). While my study only takes into consideration the implementation of major trade distorting policies, other areas to be studied would be that of sanitary and Phytosanitary restrictions and their impact on trade as well as other Japanese supports. Updating more comprehensive Japanese research such as Kobayashi (1999) would present a well-rounded understanding of Japanese policy beyond national statistics.

As my study primarily looked into the tariffication, other areas such as is non-tariff barriers in Japan and new programs in the U.S. may be of interest. Of primary concern is how, and to what extent implementation of maximum residue levels (MRIs) affect trade (USA Rice Federation Staff, 2009). Another area for policy study would be that of the impacts of the ACRE program on the rice industry since its 2009 crop year implementation (Childs and Baldwin, 2008). Given more time and resources, a more comprehensive analysis of both countries' rice industries that breaks down production regionally, such as Kobayashi (1999) would offer increased depth to the study. Lastly, the topic area would benefit from historical case studies on policy measures by Political Action Groups (PACs) and the like for each country. Understanding the relationship between the U.S. and Japan to a greater degree, from a variety of relevant angles could bring more clarity to policymakers and understanding to such a complex topic.

FIGURES

Figure 1. Historical USDA And MAFF Rice Production and Consumption

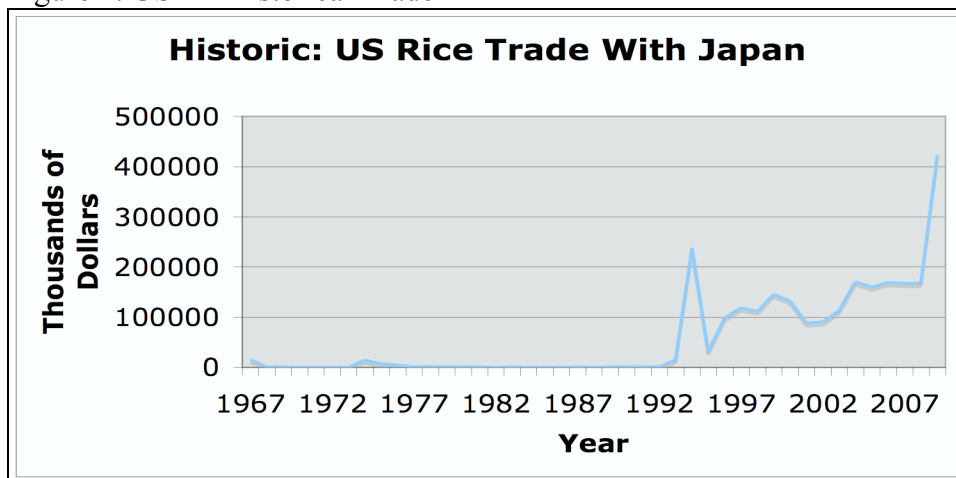


Source: OECD 2009. "Producer and Consumer Support Estimates." *Rice Level of Production; Level of Consumption*. Organization for Economic Cooperation and Development.

Generated: Microsoft Excel.

Note: Graph includes all varietals: Japanese Market mainly consists of medium-grain, while U.S. market mostly long-grain.

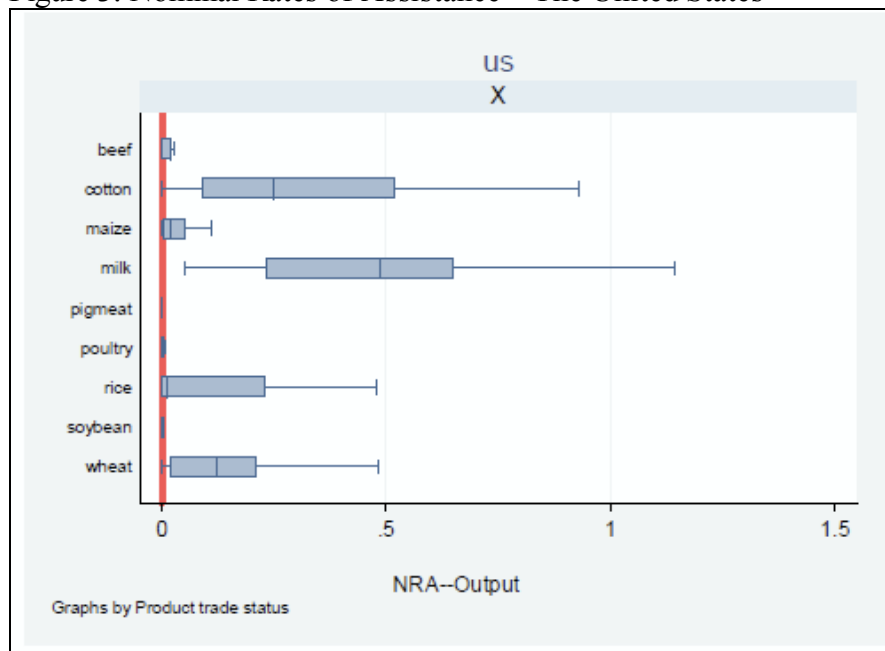
Figure 2. USDA Historical Trade



Source: USDA GATS. 2010. "Standard Query – Rice." *United States Department of Agriculture Global Agricultural Trade System Online*. February.

Note: Spike in 1994 due to Japanese crop failure.

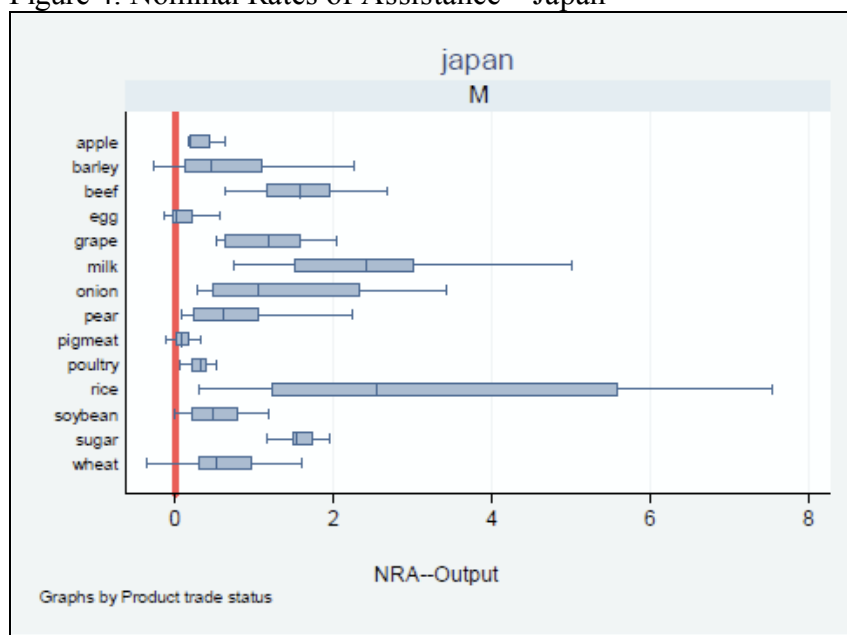
Figure 3. Nominal Rates of Assistance – The United States



Source: Gawande, Kishore, and Bernard Hoekman. 2009 "Why Governments Tax or Subsidize Trade: Evidence From Agriculture." *World Bank Working Paper Series*. May.

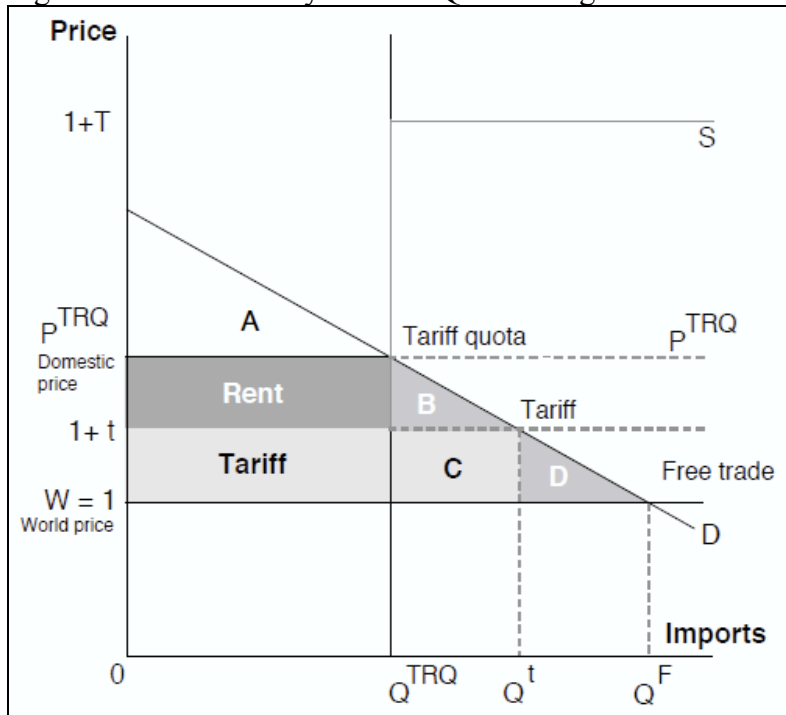
Note: X indicates NRA spread up to .5 – relatively insignificant.

Figure 4: Nominal Rates of Assistance – Japan



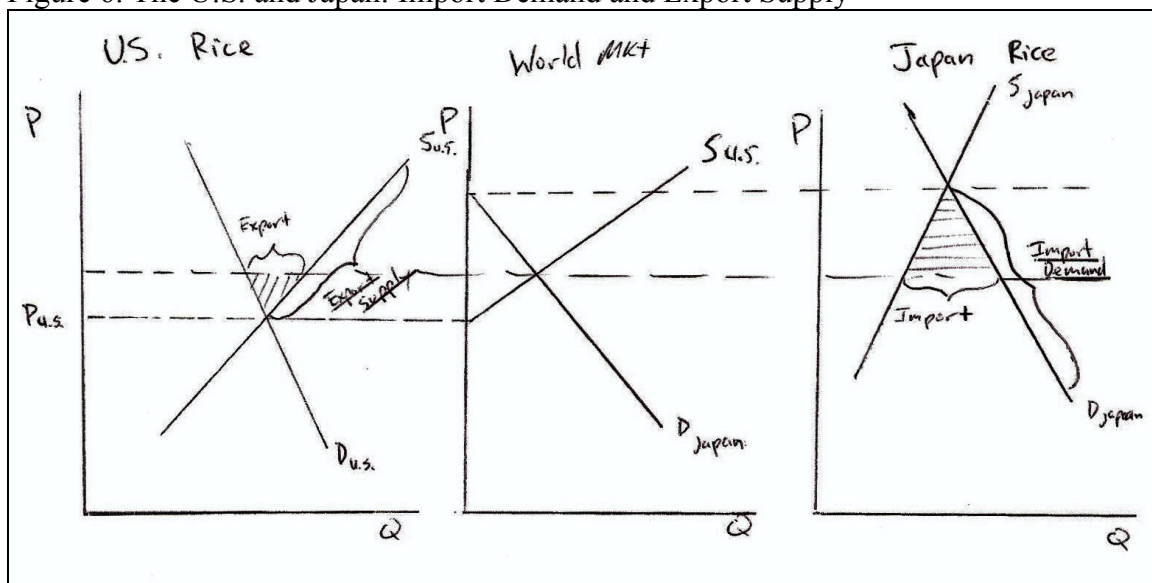
Source: Gawande, Kishore, and Bernard Hoekman. 2009 "Why Governments Tax or Subsidize Trade: Evidence From Agriculture." *World Bank Working Paper Series*. May.
 Note: Large plot spread for rice demonstrates varying sizable effect of liberalization.

Figure 5. Welfare Analysis of TRQ Rationing



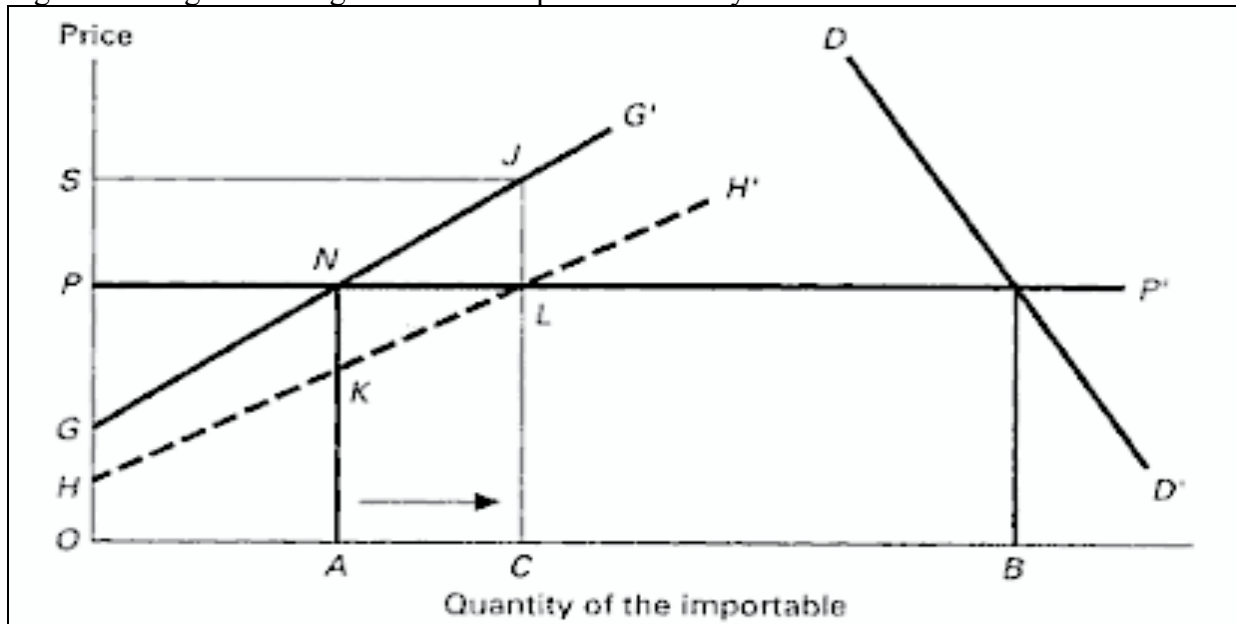
Source: Skully, David W. 2001. "Economics of Tariff-Rate Quota Administration." *U.S. Department of Agriculture – Market and Trade Economic Research Service*. Technical Bulletin No. 1893. April.
 Note: Rent is the amount paid about the allowed tariff levels.

Figure 6. The U.S. and Japan: Import Demand and Export Supply



Note: Trade interaction; representation not to scale.

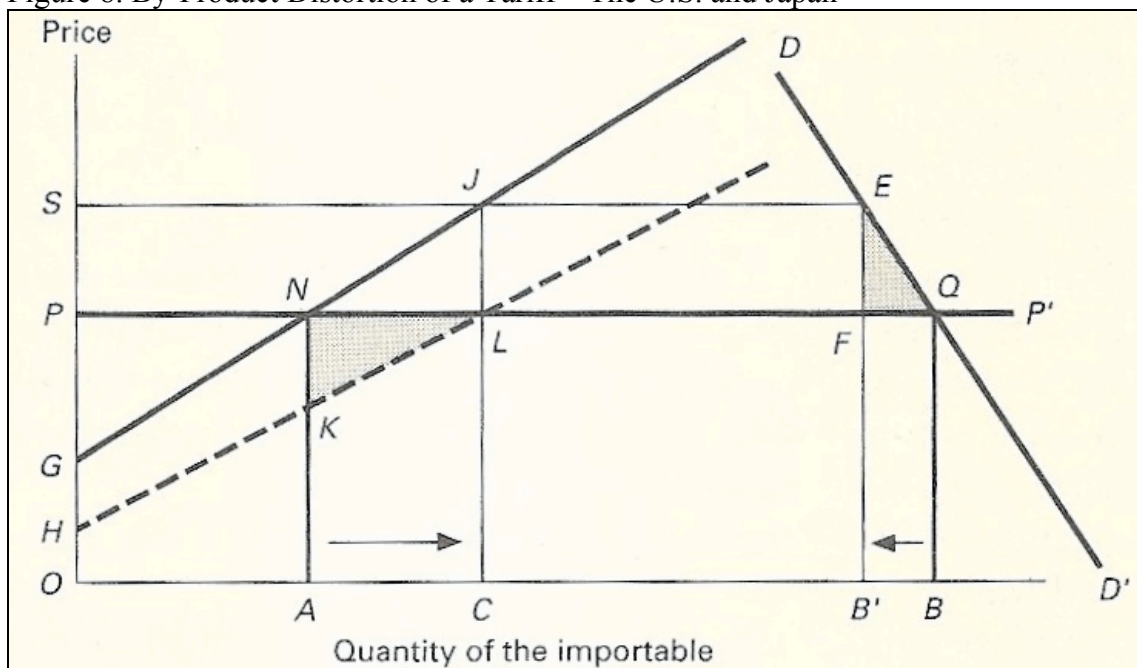
Figure 7. Marginal Divergence and the Optimum Subsidy



Source: Corden, W. M. *Trade Policy and Economic Welfare*. Oxford [England]: Clarendon, 1997.

Note: Scale varies from actual market circumstances, as actual demand caused by protective measures is smaller than OC .

Figure 8. By-Product Distortion of a Tariff – The U.S. and Japan

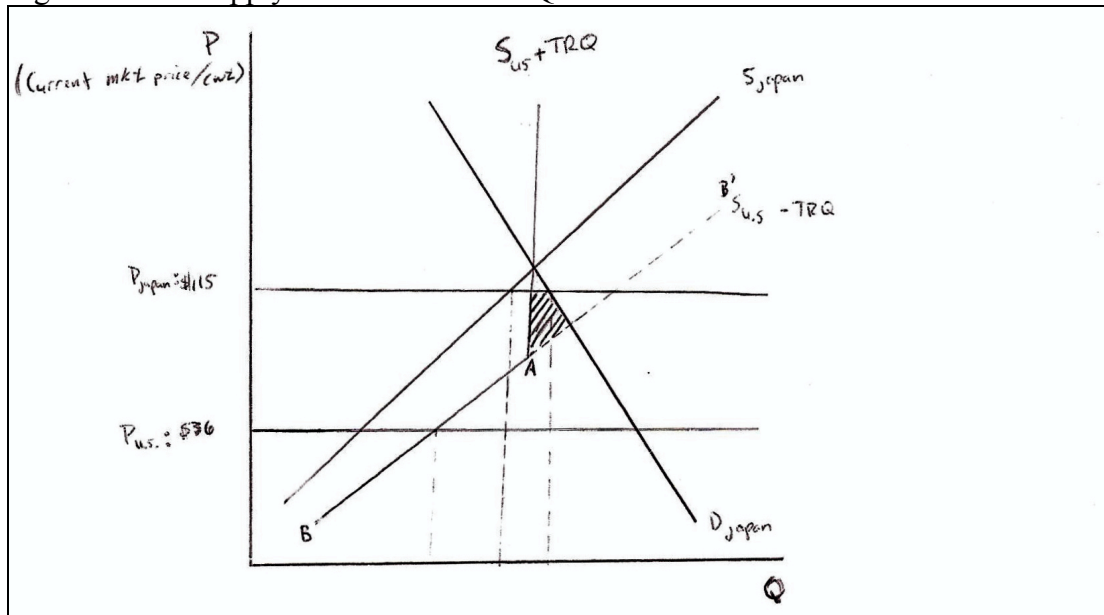


Source: Corden, W. M. *Trade Policy and Economic Welfare*. Oxford [England]: Clarendon,

1997.

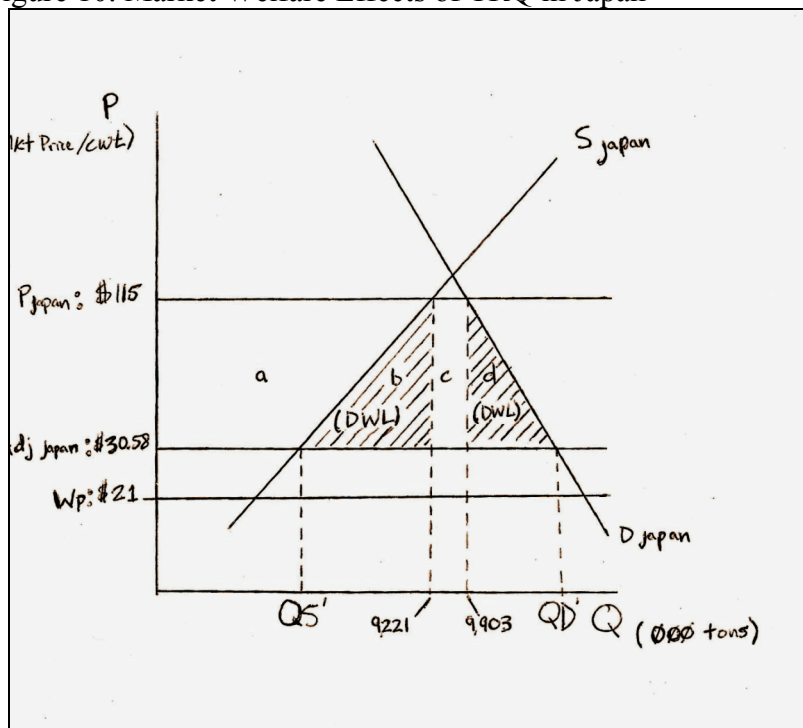
Note: Differing from a subsidy quantity demanded is affected by the raise in price. Shaded areas indicate Deadweight Loss (DWL).

Figure 9. U.S. Supply Under Tariff Rate Quota



Note: This graph shows the potential for change if the TRQ were done away with; Increase in imports as quantity demanded increases.

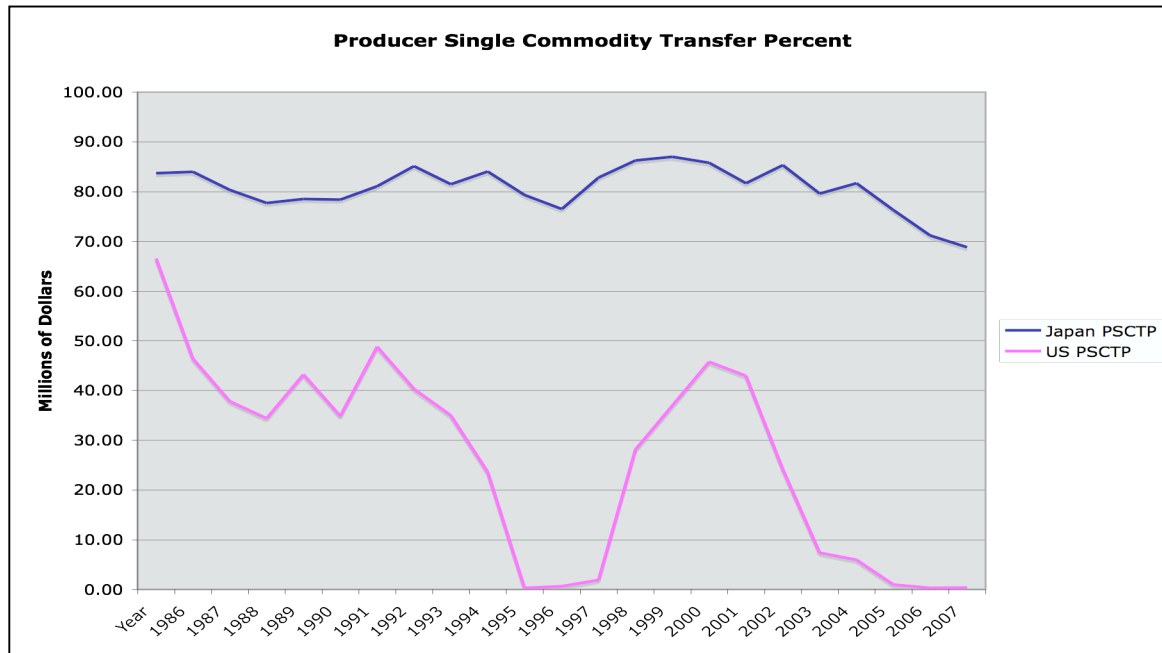
Figure 10. Market Welfare Effects of TRQ in Japan



Source: Calculated with PSE figures, given elasticities and OECD production and consumption levels.

Note: Theoretical social gain of \$746,068 without tariff; areas b and d are DWL.

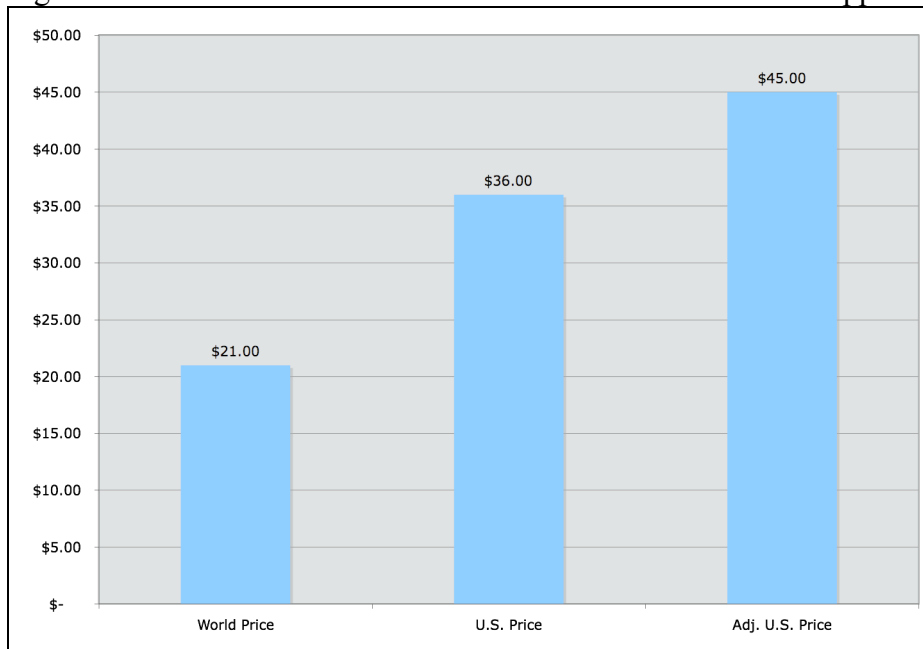
Figure 11. Rice: Percent Single Commodity Transfer (PSCT)



Source: OECD 2009. "Producer and Consumer Support Estimates." *Percent Single Commodity Transfer - Rice*. Organization for Economic Cooperation and Development. Generated: Microsoft Excel.

Note: Fluctuations in U.S. likely reflect acute shortage or surplus.

Figure 12. Medium Grain Rice - Market Price Effects Of U.S. Support Measures.



Source: Source: Calculated with PSE figures, given elasticities and OECD production and consumption levels. Generated Microsoft Office Excel.

Note: Adj. U.S. price 125% above market level, U.S. price 171% above world price.

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