

Political Economy of Safeguards and VERs

-The case of Japan-China vegetable trade -

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Abstract

This paper examines the relationship between safeguards and voluntary export restraints under the WTO system in light of political economy. We present a simple two-country model to show that the threat of invoking a safeguard measure on a politically-sensitive good can induce the exporting country of the good to restrict its export volume voluntarily. Our empirical analysis provides initial evidence showing that the fear of Japanese safeguards on some politically-sensitive vegetables may have induce Chinese producers to limit their exports to Japan voluntarily.

Keywords Safeguards; Voluntary Export Restraints; WTO; Political Economy.

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1 Introduction

One of the major achievements of the Uruguay Round was the prevention of “grey-area measures” such as voluntary export restraints (VERs) and orderly marketing arrangements (OMAs). The grey-area measures are prohibited under Article 11 of the WTO Agreement of Safeguards, one of the new agreements established in the Uruguay Round. However, VERs are still used as political compromises over trade disputes even under the auspices of the WTO.¹ This paper aims to shed some new light on the relationship between safeguards and VERs under the WTO system. To this end, we use the Japan-China trade dispute over safeguards which started in December 2000 and continued until the end of December 2001 as a case example for our empirical study. This is because the Japan-China trade dispute brings up some interesting issues about VERs under the WTO system.

On 22 December 2000, the Japanese government initiated investigations for safeguard measures on welsh onions, shiitake mushrooms and rushes used in tatami mats. On 17 April 2001, the government decided to invoke provisional safeguard measures on the three products on the basis of the preliminary results.² After notifying the WTO, the government enforced tariff quota measures on them from 23 April, which were effective for 200 days until 8 November.³ At the same time, the government continued the investigations in order to decide whether to switch the provisional safeguards to ordinary ones. In response to the measures, China, who was the largest exporter of the three goods, criticized the measures as unfair and discriminatory trade restrictions and thus called for withdrawing the measures and discontinuing the investigations. On 22 June, China invoked retaliatory measures, a 100 percent special custom duty on automobiles, mobile and car phones, and air-conditioners imported from Japan.⁴ As a result of a number

¹For example, in May 1996, the US-Canada softwood lumber dispute temporarily got settled with the US-Canada Softwood Lumber Agreement, which requires Canada to impose export admission fees to restrict its softwood lumber exports to the USA. See Lee (2002) for the inconsistency between the US-Canada trade agreement and the WTO Agreement on Safeguards.

²See *The Dairy Yomiuri*, 18 April, 2001 and *The Nihon Keizai Shimbun*, morning edition, 18 April, 2001. This is the first case that Japan has implemented general safeguard measures based on the GATT Article XIX and the WTO Agreement on Safeguards. In Japan, tariff increases of safeguards are provided by the Customs Tariff Law Article 9 and quantitative restrictions of safeguards are specified under the Foreign Exchange and Foreign Trade Law and the Import Trade Control Ordinance. See Komuro (2001) for the Japan’s safeguard law. See also Kimura (2001) and Kuno (2006) for detailed commentaries on the Japan’s safeguard actions.

³Even before the completion of the investigation for a safeguard measure, WTO members are allowed to take a provisional safeguard measure, whose duration must not exceed 200 days, only if the delay of invoking the safeguard measure would cause permanently damage to a domestic industry. See the WTO Agreement of Safeguards Article 6.

⁴See *The Dairy Yomiuri*, 23 June, 2001 and *The Asahi Shimbun*, morning edition, 22 June, 2001.

of bilateral talks, on 21 December, i.e., the deadline for the safeguard investigations, Japan and China reached an agreement that Japan would not impose the ordinary safeguard measures on the three goods, while China would remove the retaliatory duties. In addition, the two government agreed to establish a private council the purpose of which was to exchange information about production volume, market demand and prices in order to secure “orderly trade.”⁵ If the two governments had failed to resolve the trade dispute by 21 December, Japan would have shifted to the ordinary safeguard measures and taken the matter of the 100 percent punitive tariffs to the WTO dispute settlement procedure. Also, China, which joined the WTO on 11 December 2001, would have brought the matter of the ordinary safeguards to the dispute settlement procedure.

This case contained some interesting facts about the relationship between safeguards and VERs. First, by utilizing safeguards, the Japanese government committed itself not to accept rapid increases in imports of the three agricultural products from China with the expectation that China would limit its exports voluntarily.⁶ In fact, on 5 February 2001, Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF) announced a policy to consult with the Chinese government about safeguards on some farm products with the view to induce the China to restrict the farm exports voluntarily, and, on 6 February, both governments agreed to launch the intergovernmental consultations.⁷ On 28 March 2001, Finance Minister Kiichi Miyazawa expressed his view that Japan would ask China for VERs and, if China would not accept the request, Japan would not hesitate to invoke the provisional safeguards.⁸

Moreover, to understand the way Japanese government utilized the safeguards, we should note the fact that the two governments had solved trade disputes about garlic bulbs and ginger roots in a similar fashion. On 2 August 1996, MAFF began to initiate safeguard investigations on garlic bulbs and ginger roots, imports of which from China marked a sharp rise.⁹ On the other hand, on 10 September 1996,

⁵Cabinet Secretariat, “*Nittyu Souhou no Negi, Nama Shiitake, Tatami Omote no Nousanpin no Boueki Masatsu ni kansuru Kakusyo* (Memorandum between Japan and China on Agricultural Trade Conflict regarding Welsh Onions, Raw Shiitake Mushrooms and Tatami Mats)”. See also *The Dairy Yomiuri*, 22 December, 2001 and *The Nihon Keizai Shimbun*, morning edition, 22 December, 2001.

⁶For example, see *The Mainichi Shimbun*, morning edition, 20 March, 2001. Also, the Japanese government reportedly used a safeguard measure to induce China limit its towel export voluntarily. See *The Nihon Keizai Shimbun*, morning edition, 17 April, 2001.

⁷See *The Asahi Shimbun*, morning edition, 6 and 7 February, 2001.

⁸See *The Nihon Keizai Shimbun*, morning edition, 29 March, 2001.

⁹See *The Yomiuri Shimbun*, morning edition, 3 and 18 August, 1996.

MAFF asked the Chinese government for VERs on the two farm goods at a working-level negotiation.¹⁰ On 10 February 1997, Japan and China finally achieved a settlement that the Chinese government tightened control on the exports.¹¹

Second, as the settlement of the trade dispute, Japan and China finally agreed to establish “the Agricultural Products Trade Council” to promote “orderly trade” of the three agricultural goods. The Japanese government allegedly recognized that it was not against the WTO Agreement on Safeguards for the following reasons: (i) Article 11 of the Agreement did not provide rules about output adjustment; and (ii) the Council was a private forum the purpose of which was not to set numerical targets of trade volume but to exchange information on production, etc.¹² We should notice, however, that this arrangement, which differs from conventional VERs in that it lacks a formal intergovernmental agreement, is just barely within the WTO rule.¹³ Since the arrangement has been executed in fact though it may be inconsistent with the WTO rule about VERs, we can call it “*de facto*” VER.

Third, responding to invoking the provisional safeguard measures by the Japanese government, some Chinese producers moved into action to control their export volume voluntarily. In January 2001, MAFF stepped up monitoring of the import volumes of brown seaweeds and eels for safeguards¹⁴ and, in March, requested the initiation of safeguards investigations concerning eels and wakame weeds.¹⁵ The imports of brown seaweeds and eels decreased in the time period from January to March 2001.¹⁶ Further, in June 2001, controlling of imports of brown seaweeds and eels were agreed by Japan and China private associations.¹⁷

¹⁰See *The Yomiuri Shimbun*, morning edition, 11 September, 1996.

¹¹See *The Yomiuri Shimbun*, morning edition, 11 February, 1997.

¹²See *The Nihon Keizai Shimbun*, morning edition, 21 and 22 December, 2001.

¹³However, there is a suspicion that this scheme violates Article 11 of the Agreement, because (i) its real aim is to prevent sharp increases in imports of the three agricultural products from China and (ii) not only private organizations but also government officials participate in the Council, though Article 11.3 of the Agreement prohibits governmental encouragement or support to adoption of VERs by private enterprises. Moreover, we note the fact that China Chamber of Commerce of Import and Export of Foodstuffs, Native Produce & Animal By-Products, which is quasi government agency, arranged the voluntary export restraints (see *The Asahi Shimbun*, morning edition, 13 and 20 December, 2001). For the inconsistency between the Japan-China Agricultural Products Trade Council and the WTO Agreement of Safeguards, see Niibori (2002), Nakagawa (2002, pp.1032-1033) and Kawase (2003, pp.530-31).

¹⁴See *The Sankei Shimbun*, morning edition, 24 January, 2001.

¹⁵See *The Nihon Keizai Shimbun*, morning edition, 16 March, 2001.

¹⁶See *The Asahi Shimbun*, morning edition, 15 May, 2001.

¹⁷See *The Asahi Shimbun*, morning edition, 19 June, 2001. See also *The Yomiuri Shimbun*, morning edition, 19 June, 2001. If this scheme is a genuinely non-governmental one, this export cartel does not go against Article 11 of the Agreement. However, MAFF gave approval to this scheme and indicated a willingness to step up monitoring of the imports.

The above-mentioned facts indicate that the threat of safeguards can induce export countries to restrain their export voluntarily even under the WTO system. Moreover, they also indicate that the threat of safeguards does not depend on whether an importing country actually undertakes safeguard-investigations but on whether producers in exporting countries estimate the risk that safeguards may be invoked by the importing country. But, little attention has been given on this point. Bhagwati and Srinivansan (1976) and Fisher (1992) theoretically examined the effect of protectionist responses on export operations. Prusa (1992) pointed out that many anti-dumping cases were withdrawn or terminated voluntarily because forming a collusion between defendants and plaintiffs of anti-dumping cases could achieve higher profits. Rosendorff (1996a, b) investigated the choice between anti-dumping tariffs and VERs from the aspect of political economy.¹⁸ These studies, however, do not take safeguards into consideration. In addition, to our knowledge, there are no empirical studies on this topic,¹⁹ while empirical studies about the effect of VERs²⁰ and those about the impact of antidumping actions on imports abound.²¹

This paper investigates from theoretical and empirical aspects whether the exporting country facing the threat of safeguards can decrease its export volumes voluntarily under the WTO system. The main contribution of this paper can be described as follows. First, this paper provides some new insights into safeguards. The economic research on safeguards is scanty, while the economic research on antidumping is voluminous. It is surprising to look at the fact that safeguards will become the alternative policy option for a government to deal with rising protectionist pressures, if the WTO Antidumping agreement is reformed.

Second, our empirical research on the Japan-China trade dispute over safeguards is useful for predicting a way to resolve trade disputes with China after the expiration of “transitional product-specific safeguard mechanism” for Chinese products. This is important given that trade frictions between WTO

¹⁸Hillman and Ursprung (1988) also analyzed the choice between tariffs and VERs in an electoral competition model with foreign lobbying.

¹⁹For example, Liebman (2006) empirically analyzed the effect of safeguards on prices.

²⁰For example, Canto (1984), Cima (1986), Blecker (1989), Gallet (1997) and Scott and Blecker (1997) empirically analyzed the effect of VERs.

²¹For example, Staiger and Wolack (1994), Prusa (1997, 2001), Konings *et al.* (2001) and Zanardi (2004) empirically analyzed the effects of AD actions on imports.

member countries, in particular the US and the EU, and China have occurred frequently since China's accession to the WTO. For example, a flood of textile imports from China, which was due to the expiry of the Agreement on Textiles and Clothing on 31 December 2004, caused the rush of petitions in the US for the special safeguard measure for Chinese textiles,²² and, in May and September 2005, the US invoked the special safeguards for a total of nine Chinese textile products such as cotton shirts, trousers and underwear. As a result of bilateral consultations, the US and China signed on 8 November 2005 the Memorandum of Understanding between the Governments of the United States of America and the People's Republic of China Concerning Trade in Textile and Apparel Products, where the imports of 34 Chinese textile products were limited to grow 10 percent in 2006, 12.5 percent in 2007 and 15 or 16 percent in 2008.²³ We note, however, that the trade disputes with China like this occurred under the framework based on the China-specific safeguard clause, and thus they can hardly provide us with useful information about a quite possible way to resolve the future trade disputes with China. On the other hand, the Japan-China trade dispute occurred just before China's accession to the WTO, and China, which was not a member of the WTO yet, referred in the course of the dispute to the WTO rules. Nakagawa (2002) called this case "an example of *de facto* application of the WTO Agreements between a Member and a non-member of the WTO." Hence, our case study allows us to think about a quite possible settlement of the future trade disputes with China.

The remainder of this paper is as follows. Section 2 presents a simple political economy model to examine the relationship between safeguards and VERs. Our model analysis shows that the probability of invoking a safeguard measure on a politically-sensitive good can induce a disruptive exporter of the good to restrict its export volume voluntarily, if the government of an importing country weights domestic producers' profit at a sufficiently high value relative to consumer surplus, if the number of exporting countries is not sufficiently large, if exporting and importing countries' legal costs for the WTO dispute settlement procedure is not extremely high, if the probability of an importing country's winning suit is not extremely high or low, and/or if the coordination cost of the disruptive exporter for controlling its export

²²This special safeguard measure was based on Paragraph 242 of the Report of Working Party on the Accession of China to the WTO.

²³See The New York Times, 13 October and 9 November, 2005, and METI (2010, pp.97-99 and pp.308-309).

volume is not high. Section 3 empirically investigates whether the fear of Japanese safeguards caused the voluntary restraints on exports of some vegetables from China. Our empirical analysis suggests that the threat of safeguards may have induced Chinese producers to restrain their exports voluntarily in the trade of the goods which had high chance of being invoked safeguards for political reasons. Section 4 presents the concluding remarks.

2 Safeguards and VERs

2.1 VERs and the Rule of Safeguards

To motivate our subsequent analysis, we begin by discussing the relationship between safeguards and VERs. The GATT Article XIX permitted the GATT member countries to impose import restrictions if increases in imports caused serious injuries or threats of serious injuries: this safeguard clause allowed the members to protect domestic producers from their losses caused by sharp rises in competing imports. Most of the GATT members, however, hesitated to invoke safeguards: there were only 96 safeguard actions worldwide between 1970 and 1994.²⁴ This was because (i) they were required to impose import restrictions without discrimination, i.e., on a most-favored-nation basis; (ii) they were required to offer compensation to the countries sustaining damage from the safeguards; and (iii) if the damaged exporting countries did not satisfy the offer, they could take countermeasures immediately.²⁵ Due to these difficulties in the implementation of safeguards, safeguards were not proffered to VERs, and VERs, which had no clear rule in the GATT rule, prevailed since the 1970s. However, the trade distorting effects of VERs drew attention as a cause deteriorating world welfare and its bilateralism attributable threatened to undermine the principles and objectives of the GATT system. As a result, there was a growing tendency to strengthen the rules on VERs and the prohibition of VERs was decided in the Uruguay Round. Article 11.1 (b) of the WTO Agreement on Safeguards states, "... a Member shall not seek, take or maintain any voluntary export restraints, orderly marketing arrangements or any other similar measures on the export or the import side."

On the other hand, the WTO Agreement on Safeguards eases both the requirement and the procedure

²⁴See Ministry of Economy, Trade and Industry of Japan (2009, p.259).

²⁵See the GATT Article XIX. 3 (a).

for invoking safeguards in order to make safeguards more appealing. First, the WTO member countries can impose import restrictions selectively under certain conditions.²⁶ Second, the countries applying safeguards are required not to offer compensation but to make an opportunity to consult with the countries affected from the safeguards.²⁷ Third, the countries disturbed by a safeguard measure are now unable to take any retaliatory measure for the first three years that the safeguard measure becomes effective, “ provided that the safeguard measure has been taken as a result of an absolute increase in imports and that such a measure conforms to the provisions of this Agreement.”²⁸ These clauses provide more powerful incentives for the member countries to utilize safeguard measures: there were 216 safeguard investigations and 101 safeguard actions worldwide between 1995 and 2010.²⁹

We should note, however, that all the safeguard-cases brought before the WTO dispute settlement procedure were judged not to conform to the WTO requirements by panels and the Appellate Body. This is due to the “legalization” of the WTO system: the application of safeguards is restricted by stringent requirements³⁰ and is limited to the extent necessary to prevent serious injury and to facilitate structural adjustment.³¹ The legalization of the WTO system will contribute to prevent the abuse of safeguards, but it hinders the member’ agile application of safeguards in response to protectionist demands. Hence, safeguards serve as safety valves for unpredictable and uncertain situations and are necessary to maintain and facilitate trade liberalization,³² but the political function of safeguards are diminished today.³³

Under such present circumstance, as an alternative to safeguards, some WTO members may well choose the option to utilize VERs which is just barely within the WTO rule, though many members have a tendency to move to antidumping measures.³⁴ This is because VERs still can deal with rising protectionist pressures at low political costs.³⁵ First, while VERs raise prices and expand domestic outputs just like tariffs and quotas, VERs are less transparent to the public than tariffs and quotas.

²⁶This is called “Quota Modulation,” which is provided in Article 5.2 (b) of the WTO Agreement on Safeguards. See Kawase (1996) for the quota modulation clause.

²⁷See the WTO Agreement on Safeguards Article 8.1.

²⁸See the WTO Agreement on Safeguards Article 8.3.

²⁹See Ministry of Economy, Trade and Industry of Japan (2011, p.306).

³⁰See the WTO Agreement on Safeguards Articles 2 and 4.2.

³¹See the WTO Agreement on Safeguards Articles 5.1 and 7.1.

³²See Sykes (1991) and Rosendorff and Milner (2001) for this argument.

³³See Kawase (2003) for the decline of the political function of safeguards.

³⁴Bown (2002) discussed the unpopularity of safeguards relative to antidumping measures.

³⁵See Jones (1984, pp.86-93) for this discussion.

Agreements for VERs are often informal and exporting countries have responsibility to restrict their exports. Thus, it will be difficult for the public to recognize the effect of VERs.³⁶ Second, an importing country can discuss VERs with only a “disruptive” exporter and, if the negotiation reaches a settlement, the importing country can restrict only imports from the exporter. Thus, the importing country can finalize the negotiation efficiently and succeed in avoiding trade conflicts with not only the disruptive exporter but also the other exporters. Third, though VERs violates the WTO agreement, virtually no country would bring cases before the WTO panels. The reasons for this are as follows: under VERs, (i) producers in an importing country are able to recover their profits and thus the government manages to meet their protectionist demands; (ii) restraining-exporters are able to enjoy economic rents and reduce the uncertainty of trade climates; and (iii) non-restraining exporters can increase their profits.

More noteworthy is that the WTO members preferring VERs do well to keep the followings in mind. First, since the WTO members must not specifically negotiate over trade volume, the binding agreements for VERs cannot be effected and thus the discretion of export control is given to an exporting country-side. Second, agreements for VERs must not have the form of formal intergovernmental accord, because Article 11.3 of the WTO Agreement on Safeguards states, “Members shall not encourage or support the adoption or maintenance by public and private enterprises of non-governmental measures.” Hence, if some government involvements are needed to control export volumes, the WTO members should utilize the form of private pacts to forestall criticism of the governmental support and promotion of VERs. Article 11.3 does not provide that the governments of the WTO member countries aggressively prohibit such private pacts.³⁷

Viewed in this light, VERs can be regarded as a mean to respond to domestic protectionist demands, but its effectiveness depend principally on the continuing efforts of exporting countries. Hence, modeling a negotiation for VERs under the WTO, we should consider an exporting country as a Stackelberg leader and an importing country as a Stackelberg follower just like Rosendorff (1996a).

³⁶For example, Hillman (1989, p.73) pointed out that the protective effects of quantitative restrictions are less discernible to the general public than those of tariffs. Yu (2000) investigated the relationship between tariff reduction and VERs in a political economy model with informed and uninformed consumers.

³⁷See Ministry of Foreign Affairs of Japan (2003, p.459).

2.2 Political Economy of Safeguards and VERs

In this section, we build a simple political economy model, which is intended not to represent reality but to highlight the relationship between safeguards and VERs. To keep the analysis simple, we adopt a partial-equilibrium approach with specific functional forms.

There are $m + 2$ countries; Country j , $j = A, B, 1, 2, \dots, m$. Country A imports good X from the other countries. Good X is produced for consumers in Country A and the exporting countries export all the product, which is represented by x_i . The industries of good X in all the countries are perfectly competitive and their profit functions are

$$\pi_i^0(p) = px_i - l_i = pl_i^{1/2} - l_i, \quad i = A, B, 1, \dots, m, \quad (1)$$

where p denotes the price of the good in Country A and l_i denotes labor. We assume that production cost per unit of labor equals to unity and labor supply is infinitely elastic at a wage less than unity. Their profit maximizations yield the following their supply functions:

$$x_i^0 = \frac{p}{2}, \quad i = A, B, 1, \dots, m. \quad (2)$$

On the other hand, the inverse demand function for good X is given by:

$$p = a - b \sum_{j=A, B, 1, \dots, m} x_j. \quad (3)$$

Using equations (2) and (3), we derive the market-clearing price in Country A:

$$p^0 = \frac{2a}{2(1+b) + mb}. \quad (4)$$

Accordingly, the equilibrium profits in all the countries are

$$\pi_i^0 = \left(\frac{a}{2(1+b) + mb} \right)^2, \quad i = A, B, 1, \dots, m. \quad (5)$$

The consumer surplus in Country A is

$$CS^0 = \frac{b}{2} \left(\frac{(2+m)a}{2(1+b) + mb} \right)^2. \quad (6)$$

Suppose now that a new cost-saving measure is introduced in Country B, while any cost-saving measure is not adopted in the other countries. This changes the profit and supply functions of the producers in Country B to the followings:

$$\pi_B^F = pl_B^{1/2} - \theta l_B, \quad (7)$$

$$x_B^F = \frac{p}{2\theta}, \quad (8)$$

where $0 < \theta < 1$ represents the degree of the cost-saving effect. Solving equations (2), (3) and (8) yields the new market-clearing price:

$$p^F = \frac{2\theta a}{2\theta + b[1 + (1 + m)\theta]}. \quad (9)$$

Accordingly, the profits of producers in all the countries and the consumer surplus in Country A change as follows:

$$\pi_i^F = \left(\frac{\theta a}{2\theta + b[1 + (1 + m)\theta]} \right)^2, \quad i = A, 1, \dots, m, \quad (10)$$

$$\pi_B^F = \theta \left(\frac{a}{2\theta + b[1 + (1 + m)\theta]} \right)^2, \quad (11)$$

$$CS^F = \frac{b}{2} \left(\frac{[1 + (1 + m)\theta]a}{2\theta + b[1 + (1 + m)\theta]} \right)^2. \quad (12)$$

Introducing the cost-saving measures in Country B expands the import of good X from Country B, $x_B^F > x_B^0$, and thus causes injury to the producers in Country A, $\pi_A^F < \pi_A^0$. Consequently, the producers in Country A will call for a safeguard measure. The relevant bureaucrats for safeguards will investigate whether to invoke the safeguard measure on good X.

When the safeguard is invoked, Country A's government sets the import quota which reduces the import volumes from the exporting countries to the original level before shifting Country B's import supply schedule:

$$x_i^{SG} = \frac{a}{2(1 + b) + mb}, \quad i = B, 1, \dots, m. \quad (13)$$

All the import licenses stemming from the import quota are assumed to be given to some importers in Country A.

The level of the import quota in equation (13) conforms to the WTO rule. The WTO Agreement of Safeguards Article 5.1 provides that if “a quantitative restriction is used, such a measure shall not reduce the quantity of imports below the level of a recent period which shall be the average of imports in the last three representative years for which statistics are available.” In addition, Article 5.2(a) of the agreement provides that, in the absence of the agreement on the allocation of shares in the quota, “the Member concerned shall allot to Members having a substantial interest in supplying the product shares based upon the proportions, supplied by such Members during a previous representative period, of the total quantity or value of imports of the product”. We note that these clauses enable us to calculate the approximate protection level of safeguards. The levels of x_i^{SG} , $i = B, 1, \dots, m$ are assumed to be known to the producers and the governments in all the countries.

Under the safeguard, the profits of producers in all the countries, the consumer surplus in Country A and the quota rent are as follows:

$$\pi_i^{SG} = \left(\frac{a}{2(1+b) + mb} \right)^2 = \pi_i^0, \quad i = A, 1, \dots, m, \quad (14)$$

$$\pi_B^{SG} = \theta \left(\frac{a}{2(1+b) + mb} \right)^2 = \theta \pi_B^0, \quad (15)$$

$$CS^{SG} = \frac{b}{2} \left(\frac{(2+m)a}{2(1+b) + mb} \right)^2 = CS^0, \quad (16)$$

$$R^{SG} = 2(1-\theta) \left(\frac{a}{2(1+b) + mb} \right)^2. \quad (17)$$

Invoking the safeguard results in $\pi_A^{SG} > \pi_A^F$, $CS^{SG} < CS^F$ and $\pi_B^{SG} < \pi_B^F$.

Country A's government seeks to maintain the present administration and cares about political support, which depends on the level of social welfare and the interest of lobby groups. We assume that only the producers organize a lobby for protection.³⁸ Hence, the government has incentive to serve the lobby's

³⁸Extra expenses are needed to overcome the free-rider problem in lobbying. At the same time, a safeguard measure leads to the costs to be diffused over the consumers and the gains to be concentrated on the relevant industry. Hence, organizing a lobby pays for producers, not consumers: producers will be successfully in a better position to lobby. See Olson (1965) for this point.

interest rather than consumers' benefit so as to secure more reliable political support from the lobby. The government will press the relevant bureaucrats by way of various means such as budget allocation and personnel assignment to protect the domestic producers from the import surge.³⁹ The bureaucrats will manage to deal with this situation quickly.⁴⁰

To describe the government and the producers are in a close political relationship, the political support function of Country A's government is given by

$$G_A = W + \mu\pi_A , \quad (18)$$

where W denotes the social welfare and $\mu > 0$ is a parameter representing the impact of the producers in Country A on the political support for the domestic government.⁴¹ Under the safeguard, the level of the political support is represented by

$$G_A^{SG} = CS^{SG} + \gamma\pi_A^{SG} + R^{SG} , \quad (19)$$

where $\gamma = 1 + \mu > 0$. Under free trade, it is

$$G_A^F = CS^F + \gamma\pi_A^F . \quad (20)$$

Facing the threat of the safeguard, the producers in Country B will petition their government to handle this situation. The government in Country B, which also cares about political support to stay in power, has the following political support function:

$$G_B = \gamma^*\pi_B , \quad (21)$$

where $\gamma^* > 1$ is a political-economy parameter representing the political influence of the domestic producers.

Moreover, we should notice that the Understanding on Rules and Procedures Governing the Settlement of Disputes apply to the Agreement on Safeguards: if Country B's government considers that Country

³⁹Moore (1992b) theoretically analyzed the relationship between politicians and bureaucrats in administered protection.

⁴⁰For example, Finger *et al.* (1982), Moore (1992a) and Hansen and Prusa (1997) empirically examined the determinants in the initiation of anti-dumping tariffs or safeguards in the United States and showed that political factors as well as some rule-based factors were essential in its approval.

⁴¹See Baldwin (1987) for this type of political support function. See also Grossman and Helpman (1994, 1996) for its micro-analytic foundation.

A's invoking the safeguard measure is not consistent with the WTO rule, Country B's government can bring the matter before the WTO dispute settlement procedure. Thus, the model is structured as a four-stage game. The game tree of this game is described as Figure 1, which illustrates the sequence of events and the possible alternative strategies.

In the first stage, Country A's government decides whether to initiate the safeguard investigation. Initiating the investigation, Country A's government must consult with Country B's government about the safeguard. If the investigation is not initiated, the free trade equilibrium will persist.

In the second stage, in their consultation, Country B's government can ask Country A's government to withdraw the safeguard in exchange of an export restriction. As argued in section 2.1, in this VER deal, Country B acts a Stackelberg leader and Country A as a Stackelberg follower because the Agreement on Safeguards explicitly prohibits the WTO members from specifically negotiating over trade volume and concluding the binding agreements for VERs. The producers in Country B reduce exports from x_B^F to x_B^V under the control of their government. This coordination requires the cost of F . The other producers are assumed to be unable to adjust their outputs. Under the voluntary export restraint, the political support functions of both governments are as follows:

$$G_A^{VER} = CS^{VER} + \gamma\pi_A^{VER} = \frac{b}{2} \left(\frac{(m+1)a + 2x_B^V}{2 + (m+1)b} \right)^2 + \gamma \left(\frac{a - bx_B^V}{2 + (m+1)b} \right)^2, \quad (22)$$

$$G_B^{VER} = \gamma^*\pi_B^{VER} - F = \gamma^* \left(\frac{2a - [2\theta + b(2 + (m+1)\theta)]x_B^V}{2 + (m+1)b} \right) x_B^V - F. \quad (23)$$

In the third stage, if both governments cannot reach a mutually satisfactory compromise, Country A's government has to decide whether to invoke the safeguard measure. If the safeguard measure is not invoked, the free trade equilibrium will persist.

In the fourth stage, if Country A's government invoke the safeguard, Country B's government has to decide whether to request the WTO Dispute Settlement Body (DSB) to establish panels to examine the consistency of the safeguard. For simplicity, we treat the panel and the Appellate Body to examine this case as an entity. Both governments bear the cost of C_i^{DSU} , $i = A, B$ for the WTO dispute settlement procedure. There is a constant *ex ante* provability, $0 < \rho < 1$, that Country A's government wins the

case. The level of ρ is assumed to be known to the producers and the governments in Countries A and B. We assume that Country A's government, complying with the recommendation of the panels, repeals the safeguard measure if it loses the case.⁴² In the WTO dispute-settlement procedure, expected political gains are, respectively:

$$G_A^E = \rho G_A^{SG} + (1 - \rho)G_A^F - C_A^{DSU} , \quad (24)$$

$$G_B^E = \rho G_B^{SG} + (1 - \rho)G_B^F - C_B^{DSU} . \quad (25)$$

If Country B's government does not take the matter to the DSB, the safeguard-equilibrium will persist.

Let us derive by backward induction the condition where the VER deal which Country B's government offers is agreed on. In the fourth stage, Country B's government brings the case to the DSB, if $G_B^E > G_B^{SG}$. For this condition to be met, we assume that ρ and C_B^{DSU} are not extremely high. In the third stage, Country A's government invokes the safeguard measure if $G_A^E > G_A^F$. For this condition to be met, we assume that ρ is not extremely low and C_A^{DSU} is not extremely high.

In the second stage, the VER deal between both governments is agreed on, only if $G_B^{VER} > G_B^E$ and $G_A^{VER} > G_A^E$ are met. Country B's government will offer a VER deal if restraining its export volume can secure more political support: $G_B^{VER} \geq G_B^E$. We should notice that reducing the export volume from x_B^F can bring a benefit larger than π_B^{SG} to the producers in Country B because of $\pi_B^F > \pi_B^{SG}$ and $d\pi_B^{VER}/dx_B|_{x_B=x_B^F} < 0$. By using price making-power on the trade of good X, Country B can maximize their profits at $x_B^M = a/[2\theta + b(2 + (m + 1)\theta)]$, which is smaller than x_B^F . Reducing export volume from $\hat{x}_B = [2 + (m + 1)b]\theta a/[(2\theta + b(2 + (m + 1)\theta))(2\theta + b(1 + (m + 1)\theta))]$, however, cannot bring to Country B a profit larger than π_B^F .⁴³ Noting $\pi_B^F(x_B^V)$ is concave and $x_B^M > \hat{x}_B$, we can obtain the following lemma.

Lemma 1 *The producers in Country B can make larger profits than their profits under free trade by*

⁴²In many cases, the recommendations mentioned in a panel or the Appellate Body report have been implemented. See Araki *et al.* (2008) for the problem of the nonfulfillment of recommendations adopted by a panel or the Appellate Body.

⁴³ $\hat{x}_B$ is the export volume satisfying $G_B^{VER}(\hat{x}_B) = G_B^{VER}(x_B^F)$.

restraining their export volume in the range between $\hat{x}_B$ and x_B^F .

The difference between x_B^F and $\hat{x}_B$ is given by

$$x_B^F - \hat{x}_B = \frac{2ba}{[2\theta + b(2 + (m+1)\theta)][2\theta + b(1 + (m+1)\theta)]} . \quad (26)$$

It is straightforward to show that as the number of the exporting countries other than Country B increases, this difference gets smaller; $d(x_B^F - \hat{x}_B)/dm < 0$. This is because as the number of the exporting countries expands, the price making-power of Country B gets weaker; $d^2\pi_B^{VER}/dmdx_B^V < 0$. This finding leads us to the following proposition.

Proposition 1

As the number of the exporting countries other than Country B expands, Country B is in tougher position to offer its voluntary export restraint.

On the other hand, Country A's government will withdraw the safeguard if $G_A^{VER} \geq G_A^E$. We can easily show that Country A's government can obtain more political support from Country B's VER only if it places a sufficiently high value on the domestic producers' profits.

Lemma 2 *If $\gamma \geq \bar{\gamma} = [2 + (m+1)(2\theta + b(1 + (1+m)\theta))]/[\theta(2 + b(m+1))]$, the voluntary export restraint by Country B can provide more political support to Country A's government.*

The lemma 2 indicates that the acceptance of Country B's VER deal requires Country A's government weighting the producers' profit at a sufficiently high value relative to the consumer surplus. This is due to the fact that Country B's voluntary export restraint increases the profit of the domestic producers, $d\pi_A^{VER}/dx_B^V < 0$, but it reduces the consumer surplus, $dCS^{VER}/dx_B^V > 0$. This finding also implies that even if exporting countries can control their export volumes, VERs are not always practicable means. We presume $\gamma \geq \bar{\gamma}$ is met to examine the case where Country A's government wants to protect the domestic producers from international competition for political ends.

We can also show that as the number of the exporting countries increases, the critical value of Country A's political weight gets higher; $d\bar{\gamma}/dm > 0$. This is because, as the number of exporting countries increases, Country B's VER brings less and less benefits to the producers in Country A;

$d^2\pi_A^{VER}/dmdx_B^V < 0$. Here, we can present the following proposition.

Proposition 2

As the number of the exporting countries other than Country B expands, Country A's government becomes less and less willing to accept the voluntary export restraint by Country B.

In addition, since Country B's VER increases the price of the good in Country A, the VER enhances the profits of the producers in the exporting countries other than Country B, $d\pi_j^{VER}/dx_B^V < 0, j = 1, \dots, m$.

We can obtain the following proposition.

Proposition 3

The producers in the exporting countries other than Country B also benefit from the voluntary export restraint by Country B.

This result indicates that non-restraining exporters can increase their profits thanks to the export restriction by a disruptive exporter and thus they do not have objection to the VER.

Lastly, we note that, when x_B^V is restricted to x_B^{SG} , the producers' profit and the consumer surplus in Country A are same as what they are under the safeguard, but the quota rent is equal to zero. If ρ is unity, G_A^{SG} may be larger than $G_A^{VER}(x_B^{SG})$; $G_A^{SG} - G_A^{VER}(x_B^{SG}) = ((1-\theta)/2)(a/(1+b))^2 - C_A^{DSU}$. Under this circumstance, to compensate for the political loss of Country A's government due to the zero-quota rent, Country B's government has to choose the export volume smaller than x_B^{SG} .⁴⁴ Here, we define $\bar{x}_B$ as the export volume satisfying $G_A^{VER}(\bar{x}_B) = G_A^{SG}$.

We are now in the position to analyze the voluntary export restraint by Country B. Country B's government chooses x_B^V so as to maximize

$$\gamma^* \pi_B(x_B^V) = \gamma^* \left(\frac{2a - [2\theta + b(2 + (m+1)\theta)]x_B^V}{2 + (m+1)b} \right) x_B^V \quad s.t. \quad G_A^{VER} \geq G_A^E. \quad (27)$$

We will solve this maximization problem diagrammatically with the aid of the figures which takes Propositions and Lemmas into consideration. First, we consider the situation where a small number of exporting countries exist: m is a little number. Further, it is helpful to make a distinction between two cases; (i)

⁴⁴This is because $dG_A^{VER}/dx_B^V|_{x_B^V=x_B^{SG}} < 0$. To meet $G_A^{VER}(x_B^V) = G_A^{SG} + C_A^{DSU}$, the government in Country B has to set $x_B^V = x_B^{SG} - ([2 + (m+1)b][b(2 + m - \gamma) + \sqrt{b^2(2 + m - \gamma)^2 + 2b(2 + b\gamma)(1 - \theta)}]a)/(b[2 + b\gamma][2(1 + b) + mb])$.

$x_B^M < \bar{x}_B$ and (ii) $x_B^M \geq \bar{x}_B$. The first (second) case means that the degree of the cost-saving effect in Country B is weak (strong). If the degree of the cost-saving effect is weak (strong), the effect will make the difference between x_B^{SG} and x_B^F so small (large) that $\bar{x}_B$ becomes larger (smaller) than x_B^M .

In the case of $x_B^M < \bar{x}_B$, we can calculate the relationship between x_B^V and the political gains for the governments of Countries A and B. The relationship is drawn in Figure 2, where the scale units of the right-and-left vertical axes are adjusted so as to the height of G_A^F equals to that of G_B^F .⁴⁵ We note that G_A^E lies between G_A^F and G_A^{SG} and that x_B^M becomes smaller than x_B^{SG} . Thus, we see that exporting a volume smaller than $\bar{x}_B$ always meets $G_A^{VER} \geq G_A^E$ and Country B's government always chooses x_B^M .

In the case of $x_B^M \geq \bar{x}_B$, we can obtain such relationship between x_B^V and $G_i^{VER}(x_B^V)$, $i = A, B$, as is shown in Figure 3.⁴⁶ We note that x_B^M becomes larger than x_B^{SG} .⁴⁷ We also define $\tilde{x}_B$ as the export volume at which G_A^E intersects with G_A^{VER} . Country B's government chooses x_B^M when $\tilde{x}_B \geq x_B^M$, and chooses $\tilde{x}_B$ when $\tilde{x}_B < x_B^M$.

Next, we take the situation where a large number of exporting countries exist. Note the fact that x_B^{SG} will become smaller than x_B^M if the number of the exporting countries is sufficiently large. We can draw such relationship between x_B^V and $G_i^{VER}(x_B^V)$, $i = A, B$, as is shown in Figure 4.⁴⁸ When $\tilde{x}_B \geq x_B^M$, Country B's government chooses x_B^M . When $\hat{x}_B \leq \tilde{x}_B < x_B^M$, it chooses $\tilde{x}_B$. However, when $\tilde{x}_B < \hat{x}_B$, it cannot offer any VER deal. Furthermore, in the case where the degree of the cost-saving effect is strong, we can obtain such relationship between x_B^V and $G_i^{VER}(x_B^V)$, $i = A, B$, as is shown in Figure 5.⁴⁹ This case indicates that if the degree of the cost-saving effect in Country B is sufficiently strong, the VER-deal between Countries A and B may not be concluded.

We can now summarize these findings in the following proposition.

Proposition 4 *If Country A's government weights the producers' profit at a sufficiently high value relative to the consumer surplus, if the number of exporting countries is not sufficiently large, if the probability of Country A's losing the case is not extremely high or low, if both governments' legal costs for*

⁴⁵For example, when $a = 100$, $b = 2$, $\gamma = 25$, $m = 0$, and $\theta = 0.8$, we can obtain such a figure as Figure 2.

⁴⁶For example, when $a = 100$, $b = 2$, $\gamma = 25$, $m = 0$, and $\theta = 0.2$, we can obtain such a figure as Figure 3.

⁴⁷ $x_B^M > x_B^{SG}$ if $\theta < 2/(2+b)$.

⁴⁸For example, when $a = 100$, $b = 2$, $\gamma = 25$, $m = 10$, and $\theta = 0.8$, we can obtain such a figure as Figure 4.

⁴⁹For example, when $a = 100$, $b = 2$, $\gamma = 25$, $m = 10$, and $\theta = 0.2$, we can obtain such a figure as Figure 5.

the WTO dispute settlement procedure is not extremely high and/or if the coordination cost for controlling the export volume in Country B is not high, Country B will offer the VER deal, where Country B chooses its export volume as follows:

$$\begin{aligned} x_B^V &= x_B^M \quad \text{if } x_B^M < \bar{x}_B, \\ x_B^V &= x_B^M \quad \text{if } x_B^M \geq \bar{x}_B \text{ and } x_B^M \geq \tilde{x}_B, \\ x_B^V &= \tilde{x}_B \quad \text{if } x_B^M \geq \bar{x}_B \text{ and } x_B^M > \tilde{x}_B \geq \hat{x}_B. \end{aligned}$$

It is noteworthy that the legalization of the WTO system, which reduces the chance of WTO members' meeting the safeguard-requirements set under the WTO rules, has a stimulating effect on VERs.

In the first stage, since $G_A^{VER} \geq G_A^F$ is met, Country A's government certainly initiates the safeguard investigation and consults with Country B's government about the safeguard. Hence, the conditions in Proposition 4 are satisfied, the VER deal is approved by both governments.

Note, however, that the feasibility of the VER is positively related to the degree of the cost-saving effect in Country B. This is because the incentive for Country B to impose the VER becomes weaker as the cost-saving effect becomes stronger. The incentive arises from the fact that the cost-saving effect decreases the export price of good X and thus undermines Country B's profit. Accordingly, weak cost-saving effect will hardly lower the price and consequently export control cannot bring greater incremental profit to Country B. Hence, if the cost reducing effect is sufficiently weak, the producers in Country B cannot bear the coordination cost for the VER, for a given the number of the exporting countries. It is straightforward to show this: noting that $\pi_B^{VER} = \pi_B(x_B^M)$ when the degree of the cost reducing effect is weak, we differentiate $\pi_B(x_B^M) - \pi_B^E$ with θ and obtain $\partial \pi_B(x_B^M) / \partial \theta - \partial \pi_B^E / \partial \theta < 0$.

Proposition 5

As the cost-saving effect in Country B becomes weaker, Country B is in tougher position to impose its voluntary export restraint.

Under the VER deal, Country A's government can enjoy a greater political support than G_A^E if

$x_B^M < \bar{x}_B$ or if $x_B^M \geq \bar{x}_B$ and $x_B^M \geq \tilde{x}_B$, and it obtains the same level of political support as G_A^E if $x_B^M \geq \bar{x}_B$ and $x_B^M > \tilde{x}_B \geq \hat{x}_B$. Country B's government can also achieve a greater political support than G_B^E . In addition, the producers in the exporting countries other than Country B can reap bigger benefits. As a result, the governments of Countries A and B succeed not only in satisfying the political demands from their domestic producers and but also in avoiding the needless trade conflict between all the countries. This result indicates that the threat of invoking a safeguard measure on a political sensitive good can be utilized in order to try to find a political compromise between importing and exporting countries.

However, even though it is politically favorable for the governments of Countries A and B, the VER increases the price of good X more than p^F ,⁵⁰ which makes the consumer surplus and domestic welfare in Country A worse than what they are under free trade. This result means that VERs benefit only a small group of domestic producers at the expense of consumers' interest and overall economic efficiency due to political reasons.

3 Empirical Analysis

3.1 Framework of Empirical Analysis

This section provides an empirical analysis of whether the fear of invoking a safeguard measure in Japan could induce China to restrict its export volume voluntarily, as was shown in our model analysis. In our model, two critical assumptions have been made. First, the government in an importing country weights the profit of producers in an industry at a sufficiently high value relative to consumer surplus. Second, the value of the political weight is known to producers and the governments in exporting countries. These assumptions mean that exporters are able to perceive which domestic industries the government in the importing country desires to protect from foreign competition and how much the desire is. This kind of information can be communicated to exporters by initiating safeguard investigations or invoking provisional safeguard measures.⁵¹ In addition, as a system which can provide exporters with such

⁵⁰Under the VER, the price of good X in Country A becomes higher than p^F because $dp^{VER}/dx_B^V < 0$; $p^{VER} \geq p^{VER}|_{x_B^V=x_B^M} = [2(2\theta + b(1 + (m+1)\theta))a]/[(2 + (m+1)b)(2\theta + b(2 + (m+1)\theta))] > p^F$.

⁵¹Teramachi (2004) revealed the influence of lawmakers affiliated with farm organization on the Japanese provisional safeguards in 2001.

information, we pay notice to a Japanese safeguard system; the monitoring system for collecting information on safeguards. The safeguard monitoring system was prepared by MAFF in January 2001.⁵² This system is aim to collect constantly any information for safeguards about the specified agricultural and marine products.⁵³ Thanks to this system, safeguards will be invoked on the object goods promptly after circumstances surrounding them meet the conditions specified in the WTO Agreement on Safeguards. Harimaya *et al* (2008) proved, however, that selecting the object goods of the safeguard monitoring system was influenced by political factors, which implies that the goods monitored under this system have been desired to protect from international competition for political purposes. Since the list of the safeguard monitoring system was publicly stated, exporters are able to grasp the willingness to protect the goods.

Hence, we focus on the goods which were the subjects of safeguard-investigations or which have been the object goods of the safeguard monitoring system. As our sample, vegetables seem to be suitable in this regard because they were the major subjects of the provisional safeguard measures in 2001 and are the most typical targets of the safeguard monitoring system. Focusing only on fresh vegetables will promise to eliminate the effect of any difference from categories of products on our analysis. Moreover, the analysis here concentrates on the effect of threatening to invoke a safeguard measure in Japan on vegetable imports from China, because China disputed over the provisional safeguard measures on some vegetables with Japan in 2001 and is the largest vegetable-exporter to Japan. Focusing on a single export country will give us the benefit of keeping many other factors fixed. Accordingly, we take up as our sample Welsh onions, raw shiitake mushrooms and garlic bulbs. Welsh onions and fresh shiitake mushrooms were targets of the provisional safeguards in 2001 and are object goods of the safeguard monitoring system. Garlic bulbs are also a object good. In addition, the imports of these vegetables from China were at the top of the lists between 1994 and 2001.⁵⁴

As a result, we will investigate whether the fear of invoking a safeguard measure in Japan can induce

⁵²See *The Mainichi Shimbun*, morning edition, 24 January, 2001.

⁵³See "Preparing for the monitoring system for collecting information on Safeguards (Se-fu ga-do ni kakaru jyoho syusyu monitaringu taisei no seibi ni tsuite), " the Ministry of Agriculture, Forestry and Fisheries of Japan, May 2001.

⁵⁴Though onions and tomatoes, which are the object goods of the safeguard monitoring system, are imported from China, China was not the largest exporter to Japan between 1994 and 2001.

Chinese farmers producing the vegetables to restrict their export volume voluntarily. However, one difficulty is confronted: the lack of data does not allow us to follow such approach as earlier studies on VERs adopted: many previous works on VERs empirically examined the effect of VERs on prices or import volume through controlling the effect of demand and supply factors in domestic economy.⁵⁵ In our econometric analysis, we have to use monthly data about the imports of the vegetables from China so as to ensure the size of the data because a constant increase in the imports began in the beginning or middle of 1990s. However, while we can collect monthly data about demand factors such as monthly income, we cannot get monthly data about supply factors such as cultivated acreage. To overcome this difficulty, we use a simple time series analysis: investigating the time series movement pattern of each import volume allows us to examine whether any statistically significant changes of the import occurred just around 2001, when the demand for safeguards on agricultural products were growing dramatically: the number of the petitions calling for safeguards from prefectures and those from municipalities were 31 and 1363 in 2001.⁵⁶

As our time-series econometric modeling, we employ Autoregressive Integrated Moving Average (ARIMA) models. ARIMA has the advantage that this method is able to generate confidence intervals around forecasts. Utilizing this advantage, we are able to investigate whether the actual values of the imports exceed the lower limits of the confidence intervals around the forecasts. If our analysis shows that the import volume of each vegetable changes beyond the confidence bound, it may well be considered to be the effect of VERs.

Our empirical estimations are conducted with the monthly data on the imports of the vegetables from China between 1994 and 2009, because prior to 1993 there were some months when the imports were zero. The monthly data on the imports were from Foreign Trade Statistics, The Ministry of Finance of Japan.⁵⁷

⁵⁵For example, Canto (1984) proved that a voluntary restraint agreement between the USA and Japanese and European exporters affected U.S. steel prices.

⁵⁶See "The Number of Position Documents from Local Governments Concerning the Implementation of Safeguard Measures on Agricultural, Forestry, Fisheries Products (Nourinsuisanbutsu boueki ni tsuite no se-fu ga-do hatsudo ni kansuru chiho jichitai kara no ikensyo nado no kensu)," the Ministry of Agriculture, Forestry and Fisheries of Japan, 2001.

⁵⁷Collecting these data, we utilized an open data source about Japanese vegetables, VEGETAN (Vegetable Total Aggregate Information Network), which is provided by the Agriculture & Livestock Industries Corporation.

3.2 Empirical Results

The common finding in time-series analyses is that error residuals are correlated with their own lagged values. Accordingly, we have to determine the appropriate ARIMA model to best fit time series; the appropriate lag structure in an autoregressive (AR) part and a moving average (MA) part. For this purpose, we apply Box-Jenkins forecasting procedure. Firstly, in order to identify a tentatively appropriate model, we examine the autocorrelation function (ACF) and partial autocorrelation function (PACF) plots of the first-order difference series. Secondly, to further confirm more appropriate lag structure, we estimate several ARIMA models and identify more appropriate one on the basis of Akaike Information Criterion (AIC). Based on the lowest AIC values, we select the following ARIMA models; ARIMA(14, 1, 0) for the imports of Welsh onions, ARIMA(14, 1, 2) for that of raw shiitake mushrooms, and ARIMA(12, 1, 1) for that of garlic bulbs. The results of the parameter estimation for each ARIMA model are presented in Appendix.⁵⁸ Finally, using these ARIMA models, we forecast the time series variations of the imports of the vegetables during the period when Chinese farmers seem to have been limiting their exports of the vegetables voluntarily.

Note here that the starting points of the VERs have to be presumed because Japan and China could not conclude the binding agreements of the VERs so as to observe the WTO rule. As to the starting points of Chinese VERs of Welsh onions and shiitake mushrooms, we presume they were January 2002. This is because the export control of the vegetables were reportedly arranged by some Chinese organizations in November 2001,⁵⁹ and Japan and China agreed to establish the private council to promote orderly trade of the vegetables on 21 December. As to the starting point of the VERs of garlic bulbs, we presume it was December 2001. Since any concrete action for the VERs was not reported, we make the presumption based on the fact that, compared with the same month last year, the December import of garlic bulbs marked a sharp decline, i.e., -30.7% , in 2001.

Let us check whether the actual values of the imports of the vegetables fall beyond the lower confidence

⁵⁸As a general rule, the parameter estimations for time-series forecasting are gotten through the time-series regression which is conducted on the time-series data up to the beginning of prediction interval. However, since the provisional safeguards were invoked just before the prediction interval, such a way can underestimate predicted values. Thus, our empirical estimations for time-series forecasting are conducted between 1994 and 2009.

⁵⁹See *The Asahi Shimbun*, morning edition, 13 and 20 December, 2001.

bounds. The results of our time-series forecasting are presented in Figures 6, 7 and 8, which describe actual values, predicted values and 90% confidence bounds around the forecasts for the imports of Welsh onions, raw shiitake mushrooms and garlic bulbs.⁶⁰ Figure 6 describes that the actual import volume of Welsh onions grows downward beyond the 90% confidence bound on January 2002 and falls below the predicted value from February to April 2002, but after that time it surpasses the predicted value. This result implies that the effectiveness of the VERs of Welsh onions was maintained only for a brief period after the Japan-China agreement on the agricultural trade conflict. Also, this result seems to be borne out by our theoretical prediction. Propositions 1 and 5 indicates that the number of exporting countries and the fact that the degree of drop in prices caused by cutting costs are key elements in reaching a VER agreement. The number of Welsh onions exporters in 2000 was seven, which implies that alternative suppliers of Welsh onions existed and thus China may have been in tougher position to impose the VER. Moreover, the gap between the export price of Chinese Welsh onions per kilogram in 2000 and its average export price per kilogram in 1997 to 1999 is about 41 yen, which implies that the incentive for China to restrict the export of Welsh onion voluntarily was weak, as discussed in Proposition 5. Indeed, for example, Japan and China differed greatly in their perceptions of the appropriate amount of the import of Welsh onions from China at the first meeting of the Japan-China Agricultural Products Trade Council held on 7-8 February 2002 in Shanghai.⁶¹ In addition, representative of Japanese farmers demanded China many times to conduct a thorough implementation of the export restriction of Welsh onions at the meetings of the Agricultural Products Trade Council.⁶² In June 2005, farmers growing Welsh onions in Tottori Prefecture called for the safeguard on Welsh onions to put the brakes on the imports from China.⁶³

Next, Figure 7 reveals that the actual import volume of raw shiitake mushrooms goes down beyond the 90% confidence bounds on most of months from January to December 2002.⁶⁴ This result indicates that Chinese farmers limited their exports of raw shiitake mushrooms voluntarily after the Japan-China

⁶⁰The further details about the results are shown in Appendix.

⁶¹See *the Nihon Nogyo Shimbun*, 9 February, 2002.

⁶²See, for example, *the Nihon Nogyo Shimbun*, 9 September 2004, 27 April 2005, 19 August 2005, and 15 April 2006.

⁶³See *The Asahi Shimbun*, morning edition, 3 June, 2005.

⁶⁴The actual import volume of raw shiitake mushrooms grows downward beyond the 95% confidence bound from January to April and from August to September 2002. See Table A.2 in Appendix.

agreement. The gap between the export price of Chinese shiitake mushrooms per kilogram in 2000 and its average export price per kilogram in 1997 to 1999 is about 100 yen, and the number of shiitake mushrooms exporters in 2000 was three. From our theoretical prediction, these facts indicate that the incentive for China to restrict the export of shiitake mushrooms voluntarily was strong. Indeed, for example, Japan and China had similar perceptions of the appropriate amount of the import of fresh shiitake mushrooms from China at the first meeting of Agricultural Products Trade Council.⁶⁵

Finally, Figure 8 shows that the actual import volume of garlic bulbs falls below the predicted value on most of months from January to December 2002 and declines beyond the 90% confidence bound on July 2002. This result suggests that Chinese farmers growing garlic bulbs might have controlled their export volume voluntarily without intergovernmental talks. From the fact that the gap between the export price of Chinese garlic bulbs per kilogram in 2000 and its average export price per kilogram in 1997 to 1999 is about 43 yen, and the number of garlic bulbs exporters in 2000 was three, we consider that China's incentive to control the export of garlic bulbs voluntarily was not weak. This result also indicates that the threat of a safeguard measure on a product can affect not only the trade of the targeted product but also the trade of other goods with the country exporting the targeted product. The fear of invoking a safeguard measure does not depend on whether the investigation for the safeguard is actually undertaken but on whether producers in the exporting country estimate the risk that the safeguard may be invoked.

Overall, our results show that the fear of invoking safeguards by the Japanese government in 2001 may have induced Chinese farmers to limit voluntarily their export volumes in the trade of the vegetables which had high chance of being invoked safeguards for political reasons. Moreover, these results prove that VERs can be used as a solution to trade disputes or as a mean to prevent trade conflicts even under the WTO system.

4 Concluding Comments

In this paper, we have investigated the effect of threatening to invoke a safeguard measure on an exporting country from theoretical and empirical aspects. Firstly, our theoretical analysis shows that the fear of

⁶⁵See *the Nihon Nougyou Shimbun*, 9 February, 2002.

invoking a safeguard measure on a politically-sensitive good can induce the exporting country of the good to restrict its export volume voluntarily, if the government of an importing country weights domestic producers' profit at a sufficiently high value relative to consumer surplus, if the number of exporting countries is not sufficiently large, if exporting and importing countries' legal costs for the WTO dispute settlement procedure is not extremely high, if the probability of an importing country's winning suit is not extremely high or low, and/or if the coordination cost of a disruptive exporter for controlling its export volume is not high.

Secondly, our empirical analysis shows that, on some vegetables which had high chance of being invoked safeguards for political reasons in Japan, the imports from China statistically significantly grew downward at some times after the periods when Japanese government had the highest degree of probability for invoking the safeguards. Thus, we can consider that the fear of invoking safeguards by the Japanese government may have induced Chinese farmers producing the vegetables to limit their export volume voluntarily.

On the whole, the results of this paper indicate that the threat of invoking safeguards can be utilized to induce VERs, even though article 11 of the WTO Agreement on Safeguards explicitly prohibits VERs. What is worse is that we do not have any ways of preventing VERs, because consumers cannot make the governments ban VERs with their political influence and exporting countries other than the export countries enforcing VERs will not request the withdrawal of the VERs (See Proposition 3). These facts may lead us to argue that some amendments of the Agreement of Safeguards are needed. For example, Lee (2002) insisted that, due to the absence of complaints about grey-area measures such as VERs, an effective institutional monitoring system had to be developed so as to improve the effectiveness of the WTO Agreement on Safeguards Article 11. However, we should note the fact that some WTO members have abused antidumping measures for protectionist purposes under the WTO system. Hence, we must consider the relationship between safeguards and antidumping duties, as Bown (2002) examined. Which are preferable for domestic and world welfare? To achieve higher domestic and world welfare, how the WTO articles about safeguards and antidumping duties should be amended? We will have to address

these issues in the light of political economy.

Appendix

The estimated ARIMA model for each Japan's vegetable import from China is represented by:

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \lambda_i \Delta Y_{t-i} + \sum_{j=0}^q \delta_j \mu_{t-j} ,$$

where Y_t is the vegetable imports during period t ; μ_t denotes the white noise error term during period t ; p and q are the orders of the autoregressive and moving average processes, respectively; and Δ is the first difference operator. In addition, the ARIMA models are valid for our analysis: the null hypotheses of unit root are rejected at 5% significant level on the vegetable imports.

Table A.1 shows the results of the parameter estimations about the appropriate ARIMA models for the imports of Welsh onions, raw shiitake mushrooms and garlic bulbs from China. Based on these ARIMA models, we conduct time-series predictions. The results of our predictions about the imports are described in Table A.2.

Acknowledgment

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Figure.1 Extensive Form of the Game

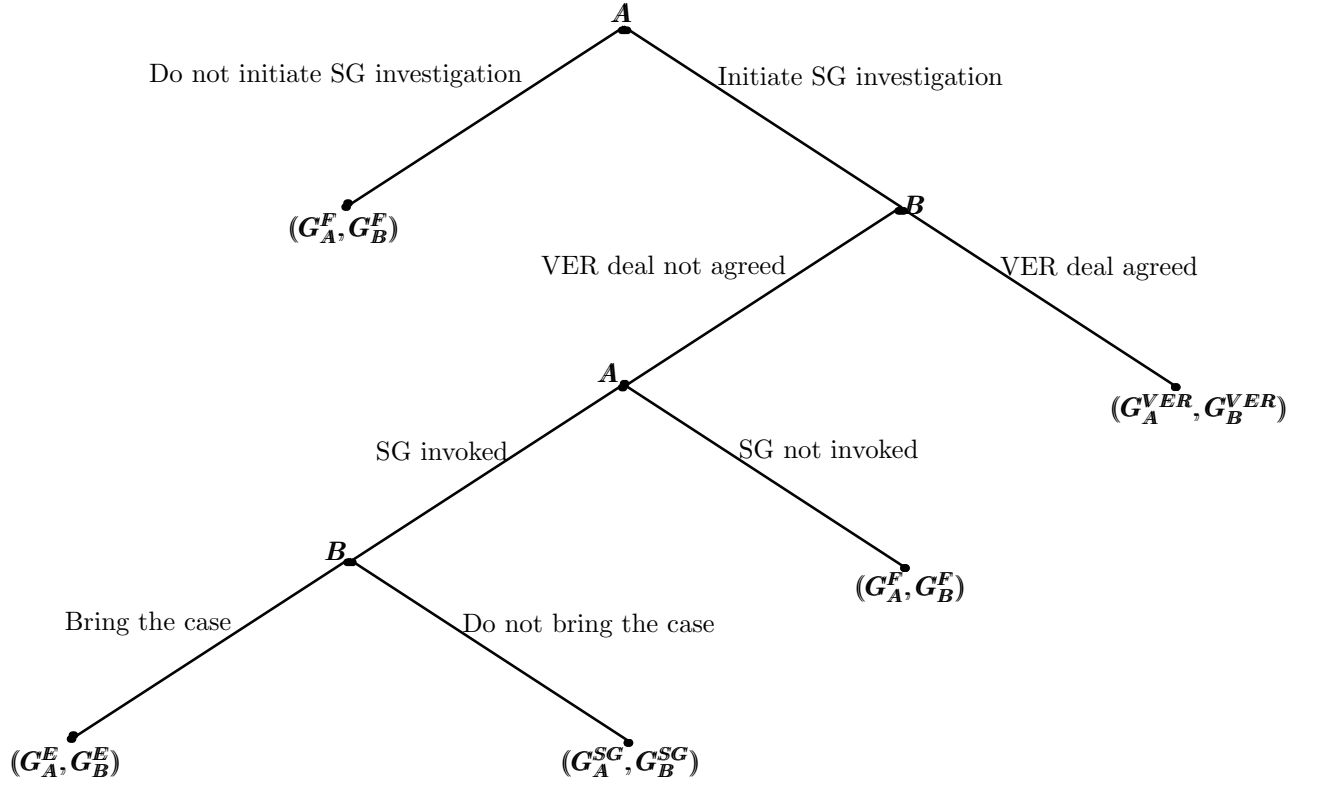


Figure.2 Political Deal of VER - Case I: m is a small number and θ is a large number.

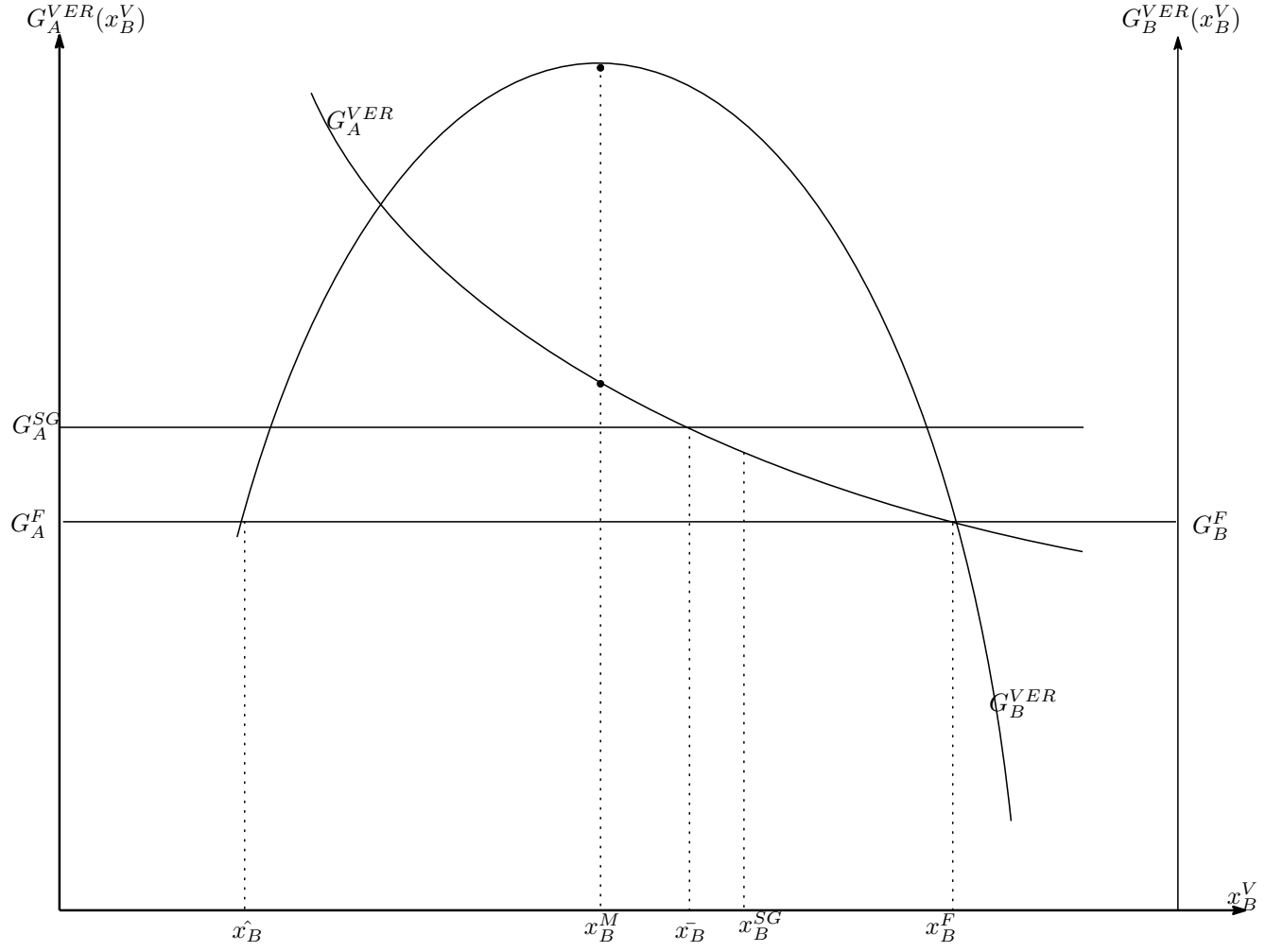


Figure.3 Political Deal of VER - Case II: m and θ are small numbers.

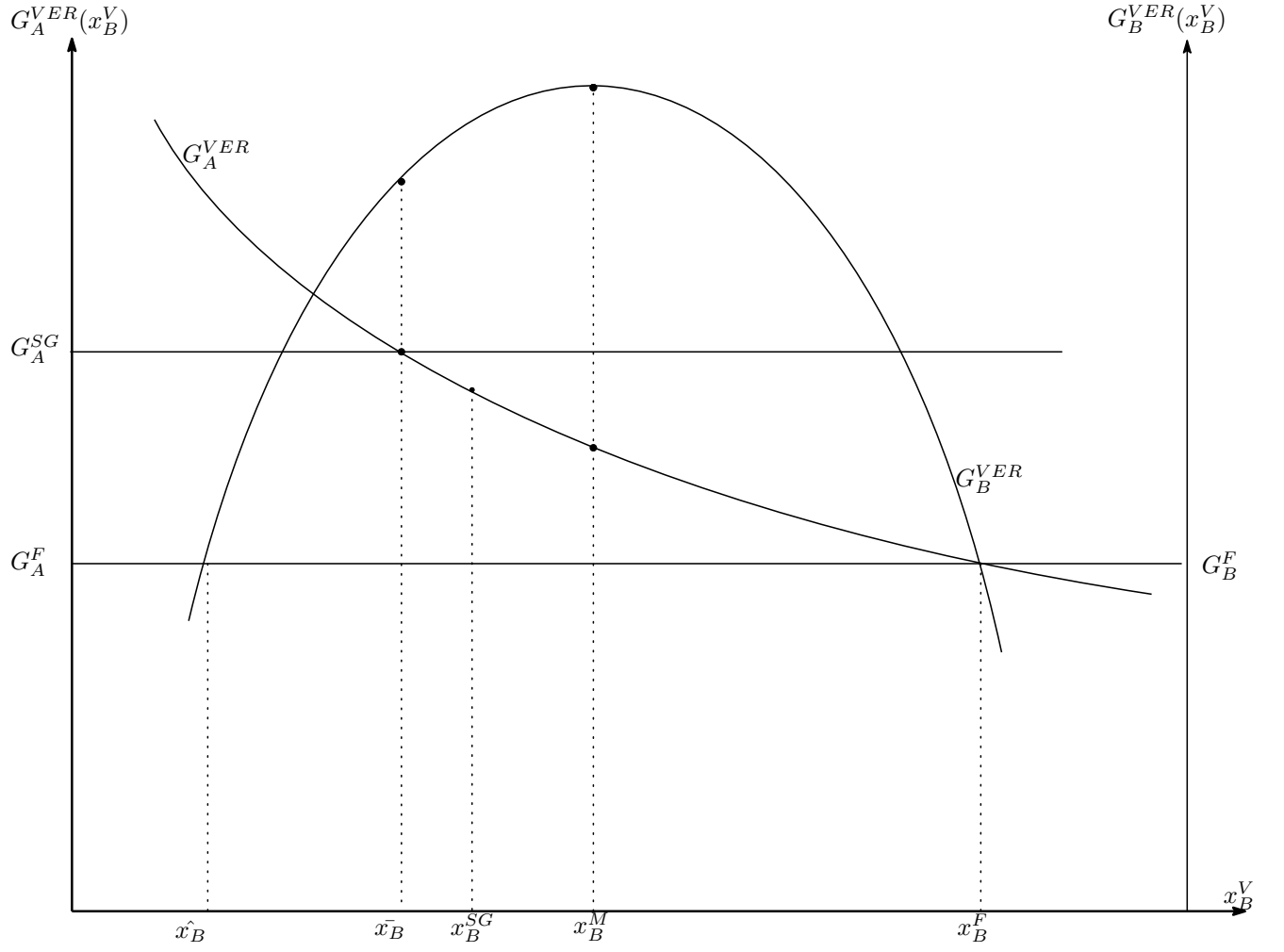


Figure.4 Political Deal of VER - Case III: m is a large number and θ is a small number.

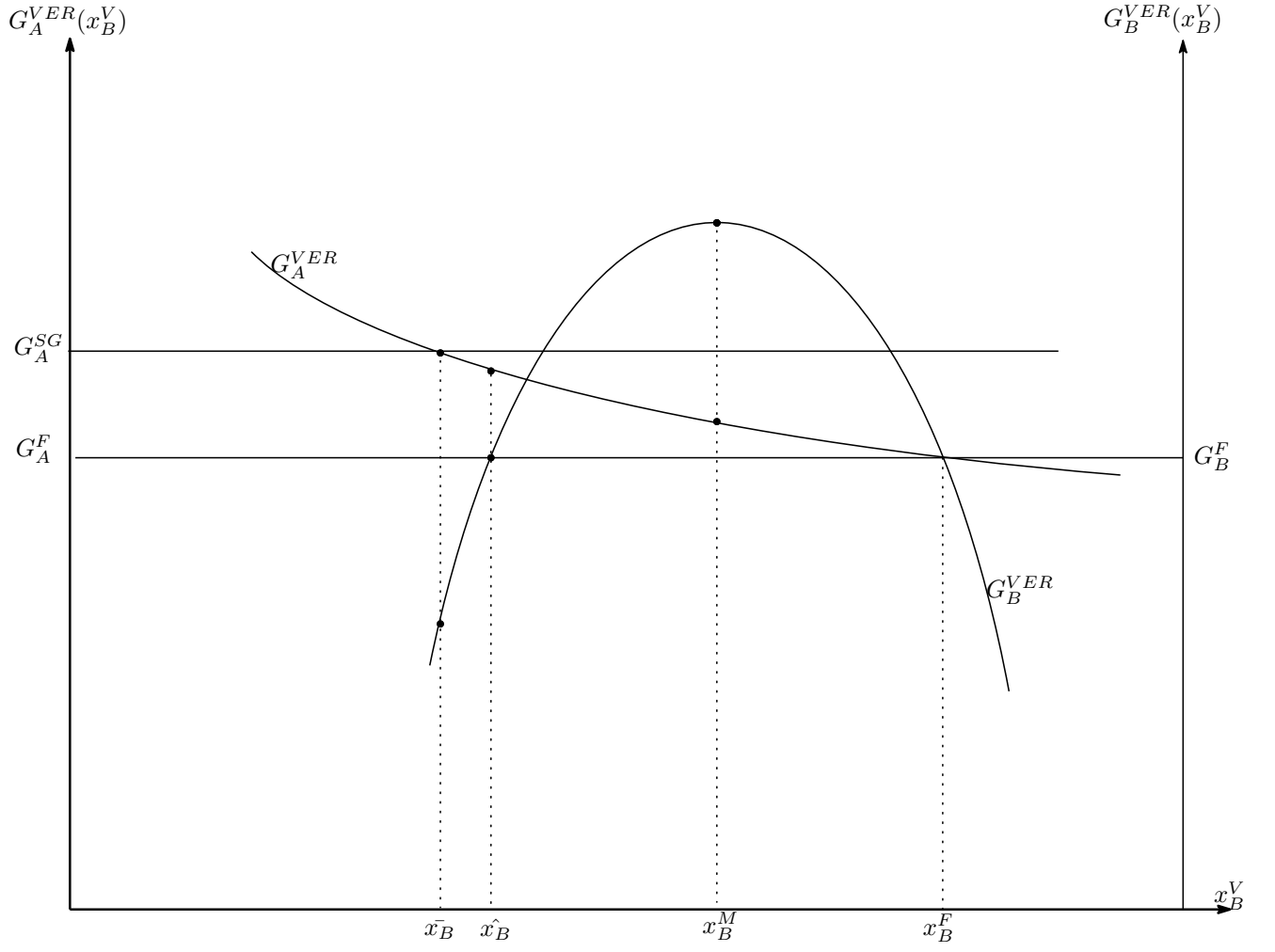


Figure.5 Political Deal of VER - Case IV: m and θ are large numbers.

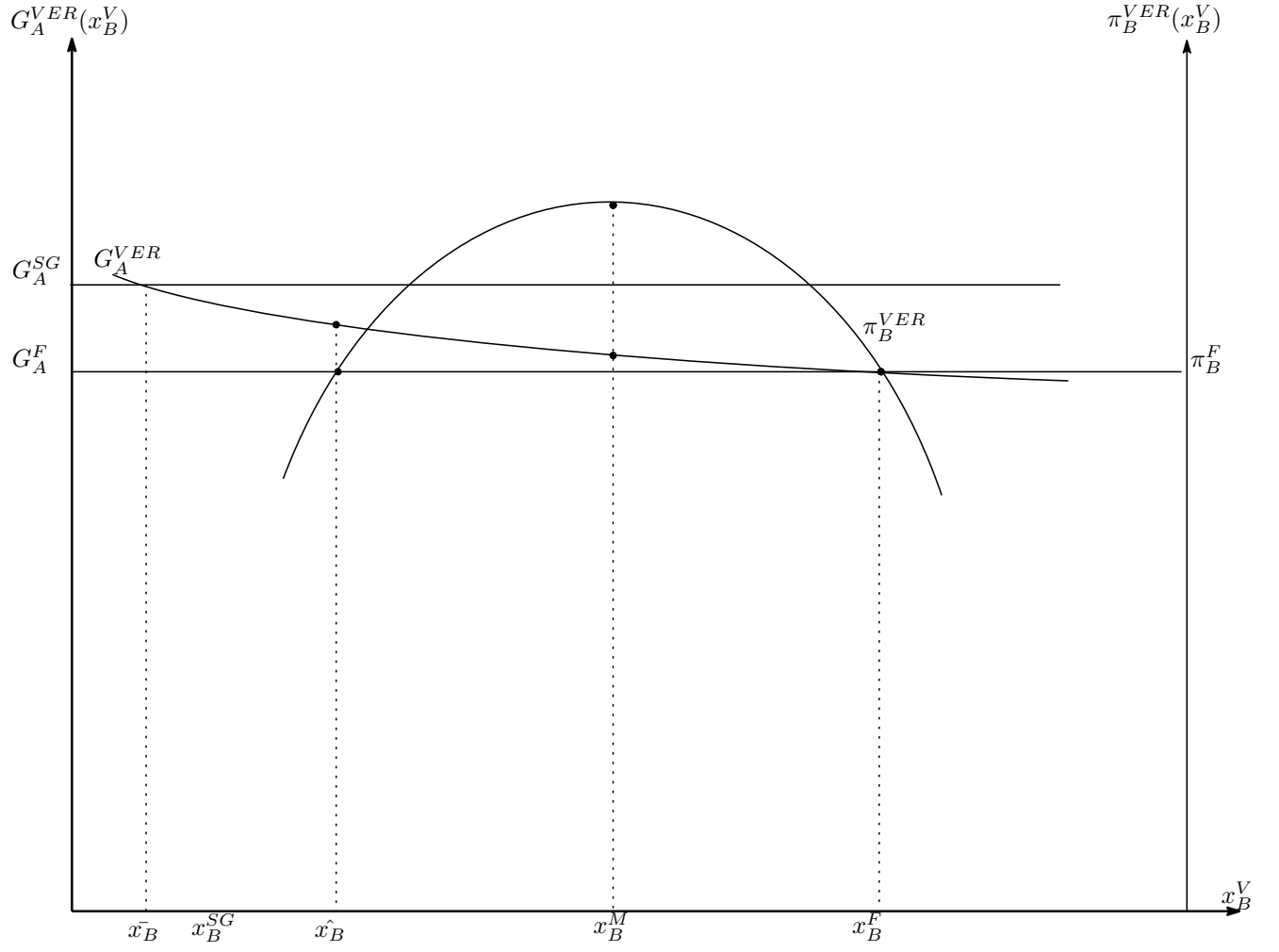


Figure.6 Comparison between Actual and Predicted Values; Imports of Welsh Onions

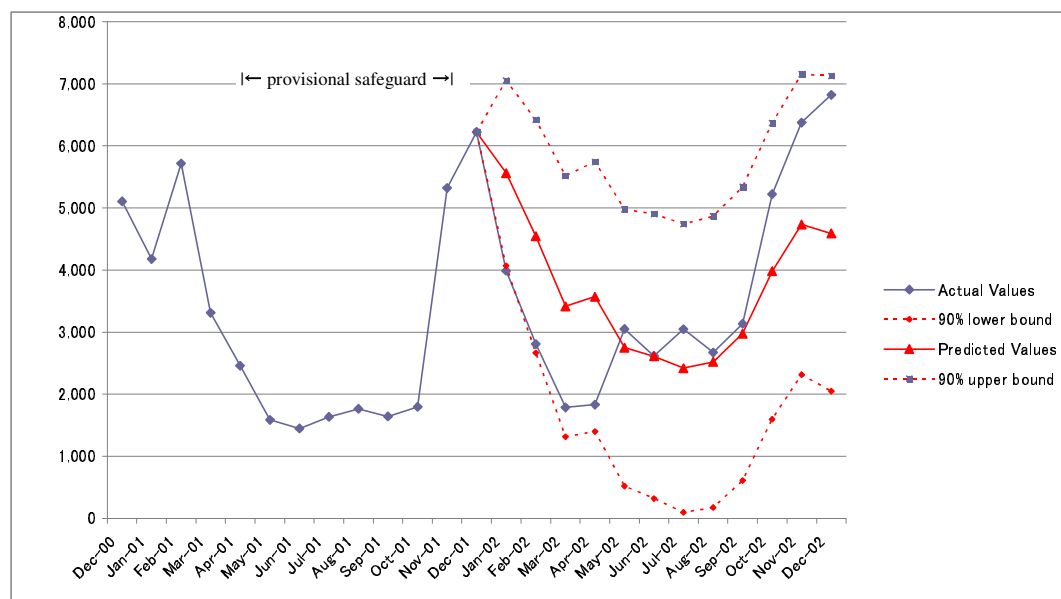


Figure.7 Comparison between Actual and Predicted Values; Imports of Shiitake Mushrooms

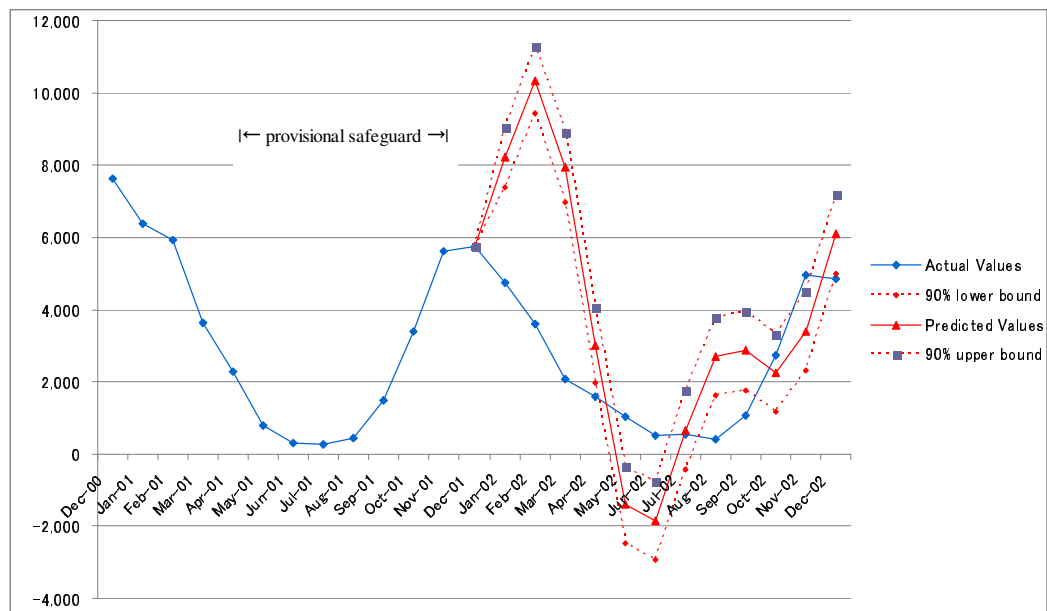


Figure.8 Comparison between Actual and Predicted Values; Imports of Garlic Bulbs

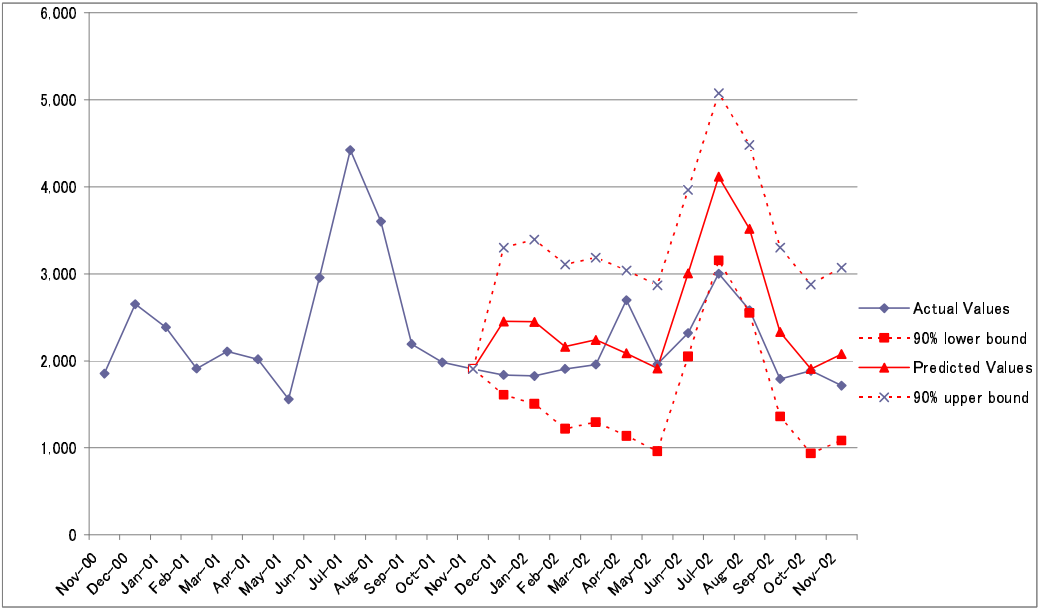


Table. A.1 Estimation Results for ARIMA(p, q, d) Models for Vegetable Imports, 1994-2009

Independent variables	Welsh onions			shiitake mushrooms			garlic bulbs		
	ARIMA(14, 1, 0)			ARIMA(14, 1, 2)			ARIMA(12, 1, 1)		
	Estimate	Std. Error		Estimate	Std. Error		Estimate	Std. Error	
<i>Constant</i>	35.2255	66.9168		-43.7459	39.9345		2.5753	6.3957	
<i>AR</i> (1)	-0.2373	0.0744	***	0.3759	0.0736	***	0.3480	0.1095	***
<i>AR</i> (2)	-0.1888	0.0764	**	-0.7553	0.0769	***	-0.2978	0.0759	***
<i>AR</i> (3)	-0.3383	0.0774	***	-0.4924	0.0952	***	0.0123	0.0949	
<i>AR</i> (4)	-0.1993	0.0809	**	-0.3657	0.0991	***	-0.0347	0.0894	
<i>AR</i> (5)	-0.1324	0.0821		-0.3006	0.1004	***	-0.0814	0.0865	
<i>AR</i> (6)	-0.2452	0.0818	***	-0.4421	0.0973	***	-0.0319	0.0879	
<i>AR</i> (7)	-0.1900	0.0830	**	-0.4263	0.0978	***	-0.0520	0.0849	
<i>AR</i> (8)	-0.1672	0.0831	**	-0.3883	0.0993	***	-0.0154	0.0866	
<i>AR</i> (9)	-0.1654	0.0819	**	-0.4209	0.0975	***	-0.0164	0.0839	
<i>AR</i> (10)	-0.0708	0.0823		-0.2921	0.1000	***	-0.1285	0.0811	***
<i>AR</i> (11)	0.1313	0.0811		-0.3032	0.0995	***	0.2163	0.0907	***
<i>AR</i> (12)	0.0996	0.0778		0.1370	0.0946		0.4619		***
<i>AR</i> (13)	-0.0327	0.0769		-0.2380	0.0749	***		0.0656	***
<i>AR</i> (14)	0.1686	0.0751	**	0.1460	0.0716	**			
<i>MA</i> (1)				0.9514	0.0081	***	0.8476	0.1051	***
<i>MA</i> (2)				-0.9980	0.0044	***			
Adjusted R^2	0.1607			0.7264			0.6911		
<i>AIC</i>	3158.12			2939.24			2939.64		
D-W-statistic	2.0064			1.9760			1.9712		
LM	12.3465			10.5303			28.1830		

Notes: ***, ** and * stand for significance at the 1%, 5% and 10% levels.

LM is the Lagrange multiplier test of residual serial correlation.

Number of observations=191.

Table. A.2 The Comparison between Actual Values and Forecast Values about Vegetable Imports

Month	Welsh onions						shiitake mushrooms						garlic bulbs					
	(Origin = Dec-01)			(Origin = Dec-01)			(Origin = Dec-01)			(Origin = Dec-01)			(Origin = Nov-01)			(Origin = Nov-01)		
	Actual	Forecast	Lower (90% Limit)	Upper (90% Limit)	Actual	Forecast	Lower (95% Limit)	Upper (95% Limit)	Actual	Forecast	Lower (95% Limit)	Upper (95% Limit)	Actual	Forecast	Lower (90% Limit)	Upper (90% Limit)	Actual	Forecast
Dec-01	6,224	—	—	—	5,755	—	—	—	1,837	2,455	1,610	3,299	1,837	2,455	1,610	3,299	1,837	2,455
Jan-02	3,987	5,561	4,068	7,054	4,745	8,213	7,215	9,211	1,825	2,450	1,505	3,394	1,825	2,450	1,505	3,394	1,825	2,450
Feb-02	2,809	4,542	2,665	6,419	3,598	10,348	9,264	11,433	1,907	2,164	1,219	3,109	1,907	2,164	1,219	3,109	1,907	2,164
Mar-02	1,788	3,416	1,316	5,516	2,073	7,940	6,766	9,114	1,958	2,242	1,297	3,187	1,958	2,242	1,297	3,187	1,958	2,242
Apr-02	1,832	3,570	1,399	5,740	1,604	2,997	1,756	4,239	2,697	2,088	1,137	3,038	2,697	2,088	1,137	3,038	2,697	2,088
May-02	3,049	2,748	520	4,976	1,036	—1,410	—2,683	—137	1,961	1,915	961	2,869	1,961	1,915	961	2,869	1,961	1,915
Jun-02	2,618	2,611	321	4,900	516	—1,853	—3,138	—569	2,320	3,006	2,049	3,963	2,320	3,006	2,049	3,963	2,320	3,006
Jul-02	3,046	2,420	98	4,741	544	668	—617	1,953	3,002	4,115	3,155	5,076	3,002	4,115	3,155	5,076	3,002	4,115
Aug-02	2,671	2,521	175	4,866	425	2,705	1,414	3,996	2,583	3,516	2,551	4,481	2,583	3,516	2,551	4,481	2,583	3,516
Sep-02	3,133	2,975	611	5,338	1,081	2,860	1,567	4,152	1,791	2,330	1,360	3,301	1,791	2,330	1,360	3,301	1,791	2,330
Oct-02	5,222	3,981	1,597	6,365	2,721	2,240	947	3,533	1,887	1,907	936	2,878	1,887	1,907	936	2,878	1,887	1,907
Nov-02	6,373	4,733	2,312	7,155	4,942	3,405	2,099	4,711	1,717	2,078	1,083	3,072	1,717	2,078	1,083	3,072	1,717	2,078
Dec-02	6,820	4,588	2,050	7,126	4,850	6,083	4,761	7,405	2,205	—	—	—	2,205	—	—	—	2,205	—