Political Contributions for Trade Policy and National Public Finance*

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Abstract

I consider how special interest groups affect trade and fiscal policies in order to protect their own interests. Previous empirical studies indicate a positive correlation between an economy's exposure to international trade and the government size. This paper explores the relation between economic openness and government spending through a political contribution approach suggested by Grossman and Helpman (1994). My conclusion is that there exists a positive correlation between the degree of trade liberalization in organized industries and the government size, whereas a negative correlation in unorganized industries. In addition, I show that it is more difficult for the countries where a large part of industries are organized to carry out trade liberalization, as the share of national income accruing to the organized sectors decreases.

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1 Introduction

This paper aims to analyze the role of the lobbying activity of industries in the determination of economic policies. The international trade theory has generally claimed that free trade is the best international trade policy for small open economies, but has, in fact, rarely practiced it in most countries. A considerable amount of researches about the political economics of trade policies have been developed in the last ten to fifteen years in order to explain the causes of the difference between practice and theory. As a result, numerous approaches have been derived from such researches. Literature reviews on these approaches can be found in detailed surveys conducted by Hillman (1989), Magee et al. (1989), Rodrik (1995) and Helpman (1996). One of these mainstream theories is the political contribution approach suggested by Grossman and Helpman (1994) as an adoption of the common agency model of Bernheim and Whinston (1986). They analyzed the relation between lobbying activities and actual trade policy decisions and succeeded in explaining why industries, by offering political contributions, can make incumbent officeholders practice the trade policy of protection that benefits these industries.[1]

It is very difficult, however, to practice protectionism because of the dominant stream toward bilateralism such as Free or Preferential Trade Agreements and multilateralism such as trade liberalization within the GATT/WTO framework. The incumbent will compensate special interest groups for their loss of free trade in order to secure their political contributions. Thus, it can be stated that government spending will increase as trade liberalization proceeds in a country that has enough special interest groups. A number of empirical studies have been conducted on the level of an economy's exposure to international trade and the government size, and it have been shown that there exists a positive correlation between the two. Cameron (1978) studied the relation between these two elements in 18 OECD countries and argued that more open economies have higher rates of industrial concentration, greater scope for collective bargaining, and stronger labor confederation; in turn, these result in larger demands for government transfers in order to mitigate external risks caused due to the openness of economy. Rodrik (1998) added these samples to 100 countries and demonstrated the existence of a positive correlation between the openness of an economy and government spending. He emphasized that the reason for such correlation is that societies seem to demand an expanded government role as the provider of social

[1]Dixit et al. (1997) expanded the political contribution approach into the application to general economic policies. Persson and Tabellini (2000), Grossman and Helpman (2001) and Mueller (2003) surveyed the literatures on special interest politics.

insurance against external shocks caused due to trade liberalization. Alesina and Wacziarg (1998) emphasized that a larger number of public goods are supplied in countries in which the government or market size are smaller. Adsera and Boix (2002) explore the combinations of trade policy, fiscal strategy and political regimes through both theoretical and empirical methods.

The purpose of this paper is to clarify theoretically the effect of the lobbying activity of special interest groups on the government size in the trend of trade liberalization through the political contribution approach suggested by Grossman and Helpman (1994). I assume that special interest groups offer policymakers their contribution schedules for import tariffs (or export taxes) and income taxation in order to make politicians protect their interests and derive the following results from my theoretical analysis. First, there exists a positive correlation between the degree of trade liberalization in organized industries and the government size, whereas a negative correlation in unorganized industries. Second, as the share of national income accruing to the lobby members decreases, politicians tend to protect producers rather than consumers in industries that are organized into lobbies and consumers rather than producers in unorganized industries. Finally, the domestic price of products in a certain sector is set higher in the case where this sector is organized in lobbies than in the case where it has no organized representations. But if the domestic production relative to the domestic demand is low enough, even unorganized industries may be protected by import tariffs. In contrast, export taxes may be applied to organized industries under this situation.

The remainder of this paper is organized as follows. Section 2 presents the basic formulation of the model. Section 3 explains the characteristics of equilibrium trade and fiscal policies, analyzes the relation between trade liberalization and government spending and discusses the interaction between trade and fiscal policies. Section 4 clarifies whether the government will protect producers or consumers in an equilibrium situation. Section 5 summarizes my main conclusions and suggests mechanisms of smoother trade liberalization processes.

2 The Model

My basic model is mainly based on Grossman and Helpman (1994). This paper considers a small open economy in which the size of the population is normalized to unity. Individuals' preferences are identical and are repre-

sented by the following quasi-linear utility function:

$$u = u_0 + \sum_{i=1}^{n} u_i(x_i) + H(g), \tag{1}$$

where x_0 is the consumption of good 0, x_i is the consumption of good $i, i = 1, 2, ..., n$, g is the volume of public goods supplied by the government, $u(.)$ is the subutility gained good i and $H(.)$ is the subutility gained by public goods.[2] I assume that both $u(.)$ and $H(.)$ are differentiable, increasing and strictly concave functions. Good 0 is considered as the numeraire good, and its world and domestic prices are equal to 1. The domestic price of non-numeraire good i is denoted by p_i and p_i^* is its world price, which is exogenously given. Since the utility function of each individual is quasi-linear, the demand function of good i can be derived as a function of its domestic price $d_i(p_i)$, where $d_i' < 0$. Each individual's expenditure E is incurred on the consumption of numeraire and non-numeraire goods; therefore, I obtain the following equation: $x_0 = E - \sum_i p_i d_i(p_i)$. By substituting this equation into (1), the indirect utility function takes the following form:

$$V(\mathbf{p}, E, g) = E + s(\mathbf{p}) + H(g), \tag{2}$$

where $\mathbf{p} = (p_1, p_2, ..., p_n)$ is the price vector of non-numeraire goods and $s(\mathbf{p}) \equiv \sum_i u_i[d_i(p_i)] - \sum_i p_i d_i(p_i)$ is the consumer surplus derived from these goods.

Good 0 is produced from only labor with constant returns to scale. Given that its input-output coefficient is equal to 1 and that there is a sufficiently large aggregate supply of labor, the wage rate is equal to 1 in a competitive equilibrium. On the other hand, the production of non-numeraire goods requires both labor and a sector-specific input factor; further, the production technology used for such goods exhibits constant returns to scale. Since the wage rate is equal to 1, the reward for the specific factor used for producing good i depends only on its domestic price. Therefore, I can denote this reward by $\pi_i(p_i)$.

Each individual's income before taxes consists of wages and the reward earned from the ownership of some sector-specific input. I assume that the specific inputs are indivisible and nontradable and that each individual can own at most one type of factor. Then, the taxable income of the members of sector i can be represented as follows:

$$M_i(p_i) = l_i + \pi_i(p_i), \tag{3}$$

[2]This type of individuals' preferences is referred to Persson and Tabellini (2000), Chapter 3. They assume that each individual has the quasi-linear preferences over private consumption and publicly provided goods.

where l_i is the total labor supply of the owners of the specific factor used in industry i, which is equivalent to their total labor income because the wage rate is equal to 1. Likewise, the social aggregate income before taxes can be derived as the following equation:

$$M(\mathbf{p}) = l + \sum_{i=1}^{n} \pi_i(p_i), \tag{4}$$

where l is the social aggregate labor supply.

In this paper, I restrict the economic policy instruments available to politicians: trade policy and income tax policy. The difference between the domestic and the world prices can be interpreted as a unit tariff rate. I denote the domestic products of good i by $y_i(p_i)$, then $y_i(p_i) = \pi_i'(p_i)$ can be led by Hotelling's lemma, where $y_i' > 0$. Since the total population is normalized to 1, the import demand function is $m_i(p_i) \equiv d_i(p_i) - y_i(p_i)$, where $m_i' < 0$ because $d_i' < 0$ and $y_i' > 0$. The government imposes a proportional income tax on individuals' incomes; its tax rate is τ, with $0 \leq \tau \leq 1$. The government revenue comprises both tariff and income-tax revenue, and the government supplies public goods that are financed by this revenue; therefore, it is represented as follows:

$$g(\mathbf{p}, \tau) = \tau \cdot M(\mathbf{p}) + \sum_{i=1}^{n} (p_i - p_i^*) m_i(p_i). \tag{5}$$

Denoting the gross-of-contributions disposal welfare of the members of sector i by W_i, I have

$$W_i(\mathbf{p}, \tau) = (1 - \tau) M_i(p_i) + \alpha_i [H(g(\mathbf{p}, \tau)) + s(\mathbf{p})], \tag{6}$$

where α_i is a fraction of the total population that owns some of this factor. The aggregate gross-of-contributions disposal welfare is equal to the social aggregate income plus the tariff and income tax revenue, that is,

$$W(\mathbf{p}, \tau) = (1 - \tau) M(\mathbf{p}) + H(g(\mathbf{p}, \tau)) + s(\mathbf{p}). \tag{7}$$

In this paper, I focus on the lobbying activity carried out by groups in which the owners of the same specific factor are organized. They have common interests in the policies for their sector; therefore, they are willing to join forces for the political activity. I assume the set of these organized sectors, denoted by L, is exogenously given and they can offer their political contributions to politicians contingent on the economic policies that they choose. Whereas, the members of unorganized sectors are unable to pressure the government. I denote the contribution schedule of lobby i by $C_i(\mathbf{p}, \tau)$, which

can be customized to maximize this sector's gross-of-contributions disposal welfare by diminishing contributions.

The incumbent government has the following two concerns: (1) social welfare and (2) gathering support for the purpose of holding their office. Therefore, the government's objective function can be represented as follows:[3]

$$G(\mathbf{p}, \tau) = \sum_{i \in L} C_i(\mathbf{p}, \tau) + a \cdot W(\mathbf{p}, \tau) \quad a \geq 0. \tag{8}$$

I focus on the following two-stage noncooperative political game. The order of this game is as follows:

1. Each Lobby simultaneously chooses his contribution schedule.

2. The government determines its economic policies.

I aim to solve the political equilibrium of this game and therefore suppose that the government always fulfills its promises; otherwise, it is unable for the incumbent to gain the support of the lobbyists.

3 Equilibrium Policy

In this and next sections, I focus on the political equilibrium policy derived from the model mentioned above, which has the same structure as the menu-auction problem suggested by Bernheim and Whinston (1986). This problem was applied to the international trade model by Grossman and Helpman (1994). Dixit et al. (1997) widely expanded this problem into economic policy-decision models. To solve the equilibrium in these models, truthful Nash equilibria are used as a central concept. In my political-contribution game, even I follow this equilibrium concept.

To ensure the existence of an equilibrium, I must restrict the policy instruments available to politicians, namely, import tariffs (or export taxes) and the income tax rate. I allow the government's trade policy (namely, the domestic price vector $\mathbf{p}$) to be continuous and in the range of $\underline{p}_i \leq p_i \leq \overline{p}_i$ for all $i = 1, ..., n$. Similarly, I limit the income tax rate τ to be continuous and $0 \leq \tau \leq 1$. Let $(\{C_i^\circ\}_{i \in L}; \mathbf{p}^\circ, \tau^\circ)$ denote the truthful Nash equilibria of this game. Then, the following are the characteristics of this equilibrium:

[3]Such a form of objective function is called the political support function. Here, a means the weight the government attaches to the aggregate welfare compared to campaign contributions. See Hillman (1982) and Grossman and Helpman (1994).

(i) Each lobby customizes its own equilibrium contribution schedule $\{C_i^\circ(\mathbf{p},\tau)\}$ so as to maximize the net welfare of its own sector for the given government's optimal policy vector. Here, I postulate $\{C_i^\circ(\mathbf{p},\tau)\}$ to be nonnegative, differentiable, and not greater than the aggregate income available to the lobby members.

(ii) The government sets the equilibrium domestic price vector $\mathbf{p}^\circ$ and the equilibrium income tax rate τ° so as to maximize its own objective function and the net welfare of each lobby for the given contribution schedules of lobbies.

Condition (ii) helps me to obtain first-order conditions of the government's optimization problem. Initially, the equilibrium combination of policies $(\mathbf{p}^\circ,\tau^\circ)$ maximizes the government's objective function $G(\mathbf{p},\tau)=\sum_{i\in L} C_i^\circ(\mathbf{p},\tau)+ a\cdot W(\mathbf{p},\tau)$; therefore, the first-order conditions imply

$$\sum_{i\in L}\frac{\partial C_i^\circ}{\partial p_j^\circ}+a\cdot\frac{\partial W}{\partial p_j^\circ}=0 \quad \text{for all } j=1,...,n, \tag{9}$$

$$\sum_{i\in L}\frac{\partial C_i^\circ}{\partial \tau^\circ}+a\cdot\frac{\partial W}{\partial \tau^\circ}=0. \tag{10}$$

Moreover, the equilibrium combination of policies $(\mathbf{p}^\circ,\tau^\circ)$ maximizes the total welfare of all lobbies $\sum_{i\in L}[W_i(\mathbf{p},\tau)-C_i^\circ(\mathbf{p},\tau)]$; thus, the first-order conditions imply

$$\frac{\partial W_i}{\partial p_j^\circ}=\frac{\partial C_i^\circ}{\partial p_j^\circ} \quad \text{for all } i\in L,\ j=1,...,n, \tag{11}$$

$$\frac{\partial W_i}{\partial \tau^\circ}=\frac{\partial C_i^\circ}{\partial \tau^\circ}. \tag{12}$$

Substituting equation (11) and (12) into (9) and (10), I can obtain the following conditions:

$$\sum_{i\in L}\frac{\partial W_i}{\partial p_j^\circ}+a\cdot\frac{\partial W}{\partial p_j^\circ}=0 \quad \text{for all } j=1,...,n, \tag{13}$$

$$\sum_{i\in L}\frac{\partial W_i}{\partial \tau^\circ}+a\cdot\frac{\partial W}{\partial \tau^\circ}=0. \tag{14}$$

Equation (13) implies the condition the equilibrium domestic price of good j should satisfy for given domestic prices of the other non-numereire goods and an income tax rate. Likewise, equation (14) implies the condition the equilibrium income tax rate should satisfy for given domestic prices of the

non-numereire goods. Solving equation (13) and (14), I can obtain the equilibrium trade and fiscal policies under my political-economic model.[4] My main purpose is to analyze the characteristics of optimal trade and fiscal policies and to reveal the interaction between them.[5]

Trade Liberalization and Public Finance

To begin with, I discuss the connection between the optimal tariff rate and the amount of government spending. The following lemma can be derived by solving equation (14).

Lemma 3.1 *As the share of national income accruing to the organized sectors decreases, the optimal government size becomes bigger.*

【Proof】 *It is possible to consider that the equilibrium income tax rate satisfies the following equation for given optimal domestic prices by substituting equation (23) and (24) into (14),*

$$H'(g^\circ) = \frac{\beta(\mathbf{p}^\circ) + a}{\alpha_L + a} \quad \Leftrightarrow \quad g^\circ = G\left(\frac{\beta(\mathbf{p}^\circ) + a}{\alpha_L + a}\right), \tag{15}$$

where $\beta(\mathbf{p}) \equiv \frac{\sum_{i\in L} M_i(p_i)}{M(\mathbf{p})}$ *represents the share of national income accruing to the organized sectors and* $\alpha_L \equiv \sum_{i\in L} \alpha_i$ *is the share of members who belong to some organized lobbies. Here,* $g^\circ = G(.)$ *is the inverse function of* $H'(g^\circ)$ *and* $H'(.)$ *decreases; therefore,* $G(.)$ *also decreases. Consequently, it can be shown that there exists a negative correlation between the share of national income accruing to the organized sectors* $\beta(\mathbf{p}^\circ)$ *and the optimal government size* g°*.* ∎

On examining the correlation between the supply of public goods and the domestic price of a certain good, I can establish the following proposition.

Proposition 3.1 *Lowering the domestic price of the product in an organized (unorganized) sector requires the larger (smaller) amount of government spending.*

[4]To solve the pair of equilibrium economic policies, Appendix A discusses the effects of a marginal change in the domestic price of a certain good and in the income tax rate.

[5]This paper does not include the detailed discussion on the shape of the optimal contribution schedule. At the equilibrium trade and fiscal policies, each lobby should pay its surplus from these equilibrium policies to the government as its campaign contributions. Here, the surplus of each lobby from the equilibrium policies can be calculated by subtracting its reservation payoffs from its payoffs gained from these equilibrium policies. For this point, see Bernheim and Whinston (1986), Grossman and Helpman (1994) and Dixit et al (1997).

【Proof】 *See Appendix B.* ∎

I can provide the intuitive explanation for this proposition as follows. Lowering the domestic price of a lobby's product decreases the income of this sector; thus, the share of national income accruing to the organized sectors decreases. Consequently, from lemma 3.1, it follows that the optimal government size becomes larger. Alternatively, lowering the domestic price of a non-lobby's product decreases the income of this sector; therefore, the share of national income accruing to the organized sectors increases. As a result, from lemma 3.1, it follows that the optimal government size becomes smaller.

The Interaction between Trade and Fiscal Policies

Here, let me examine of the interaction between equilibrium domestic prices and an equilibrium income tax rate. Initially, I consider an equilibrium income tax rate for given equilibrium domestic prices. The optimal government revenue (namely, the supply of public goods) is $g^\circ = \tau^\circ \cdot M(\mathbf{p}^\circ) + \sum_{i=1}^{n}(p_i^\circ - p_i^*)m_i(p_i^\circ)$; therefore, I can derive an equilibrium income tax rate from equation (15),

$$\tau^\circ = \frac{T(\mathbf{p}^\circ)}{M(\mathbf{p}^\circ)} \quad \text{subject to } T(\mathbf{p}^\circ) = G\left(\frac{\beta(\mathbf{p}^\circ)+a}{\alpha_L+a}\right) - \sum_{i=1}^{n}(p_i^\circ - p_i^*)m_i(p_i^\circ), \tag{16}$$

where $T(\mathbf{p}^\circ)$ represents the government's income tax revenue. Here, $G\left(\frac{\beta(\mathbf{p}^\circ)+a}{\alpha_L+a}\right)$ is not smaller than the government's tariff revenue and not larger than the sum of the social aggregate income and the tariff revenue $M(\mathbf{p}^\circ)+\sum_{i=1}^{n}(p_i^\circ - p_i^*)m_i(p_i^\circ)$. Hence, $0 \leq \tau^\circ \leq 1$. Using this equation for an equilibrium income tax rate, I can establish the following lemma.

Lemma 3.2 *Suppose that the domestic prices of all products are exogenously given. The price-reduction of a certain product decreases the equilibrium income tax rate when the price of this product is sufficiently high. However, this price-reduction increases the equilibrium income tax rate when the price of it is sufficiently low. In this connection, the critical point from decreasing the equilibrium income tax rate to increasing it is higher in the case where the industry is organized into lobbies than in the case where the industry has no organized representation.*

【Proof】 *See Appendix C.* ∎

This lemma can be intuitively explained by Figure 1 for a lobby's product and Figure 2 for a non-lobby's product. If the government lowers the domestic price of a good when it is sufficiently high, the increase in the tariff revenue caused by the increase in the imports of this good is more than the decrease in the tariff revenue caused by the reduction in its domestic price. Therefore, lowering the domestic price increases the tariff revenue earned by the government. On the other hand, lowering the domestic price, which reduces to low enough, decreases the tariff revenue earned by the government. This is because the increase in the tariff revenue caused by the increase in the imports of this good is less than the decrease in the tariff revenue caused by the reduction in its domestic price. The curve labeled TT in the graphs on the left side of Figures 1 and 2 depicts the relation between the domestic price of good j and the tariff revenue, while the curve labeled GG in the graphs on the left side of Figure 1 plots the relation between the domestic price of a lobby's product and optimal government spending. Further, the graphs in Figure 2 plot the relation between the domestic price of a non-lobby's product and optimal government spending. The difference between them reflects the level of an equilibrium income tax rate, which is represented as the curve labeled II in the graphs on the right side of Figures 1 and 2. The curve labeled II in Figures 3 and 4 represents the loci of an equilibrium income tax rate for a given equilibrium domestic price.

[INSERT FIGURES 1 AND 2 HERE]

Next, I consider the equilibrium domestic price vector of each of the products for a given income tax rate. Substituting equations (20) and (21) into (13), we can derive the following:

$$p_j^\circ - p_j^* = \frac{(1-\tau^\circ)(I_j+a)y_j(p_j^\circ) + (\alpha_L+a)\left[H'(g^\circ)[\tau^\circ \cdot y_j(p_j^\circ) + m_j(p_j^\circ)] - d_j(p_j^\circ)\right]}{-(\alpha_L+a)H'(g^\circ)\cdot m_j'(p_j^\circ)}. \tag{17}$$

Substituting equation (17) into (15) and applying the implicit function theorem, I can obtain the following lemma.

Lemma 3.3 *The increase in an income tax rate causes an increase in the equilibrium domestic price of a lobby's product and decrease in that of a non-lobby's product.*

【Proof】 *See Appendix D.* ∎

Why does the government set a high domestic price for a lobby's product and a low domestic price for a non-lobby's product based on the increase in

the income tax rate? Lobby members are considerably affected by the raise in the income tax rate because the burden of paying the income tax is greater than the gains from consuming more public goods for them. Hence, the government needs to offer more protection to producers in organized sectors and consumers in unorganized sectors in order to compensate for losses incurred due to raising the income tax rate. The curve labeled PP in Figures 3 (for a lobby's product) and 4 (for a non-lobby's product) represents the loci of an equilibrium domestic price for a given income tax rate.

Let me consider Figures 3 and 4 in more detail. The pair of equilibrium trade and fiscal policies is represented as an intersection of curves II and PP in these figures. From equation (15), I can easily show that decreasing the share of national income accruing to the organized sectors increases the equilibrium income tax rate τ° for given equilibrium domestic prices of all products. Therefore, curve II moves right as the share of national income accruing to the organized sectors decreases. In such a case, the equilibrium domestic price of a lobby's product is raised and that of a non-lobby's product is lowered. The following proposition is led by summarizing the above discussion.

[INSERT FIGURES 3 AND 4 HERE]

Proposition 3.2 *Decreasing the share of national income accruing to the organized sectors raises the equilibrium domestic price of a lobby's product and reduces that of a non-lobby's product.*

4 Protection for Producers or Consumers?

This section reveals the specific form of an equilibrium domestic price of each good and analyzes which type of producers or consumers the government aims to protect through the trade policy. By substituting equation (17) into (15) and (16), the equilibrium domestic price of good j can be derived as follows:

$$p_j^\circ - p_j^* = -\frac{[M(\mathbf{p}^\circ) - T(\mathbf{p}^\circ)][I_j - \beta(\mathbf{p}^\circ)]y_j(p_j^\circ) - [\alpha_L - \beta(\mathbf{p}^\circ)]M(\mathbf{p}^\circ) \cdot d_j(p_j^\circ)}{[\beta(\mathbf{p}^\circ) + a]M(\mathbf{p}^\circ) \cdot m_j'(p_j^\circ)}. \tag{18}$$

Similar to the statement made by Grossman and Helpman (1994), this equation states that a modified Ramsey rule can be applied to my model. All else equal, industries that have high import demand or export supply elasticities have smaller ad valorem deviations from free trade. In addition, from equation (18), I can easily verify that the domestic price of products in a certain sector is set higher in the case where this sector is organized in lobbies

than in the case where it have no organized representations. Grossman and Helpman (1994) verify that the organized interest groups collectively manage to raise the domestic prices of goods that they produce and to lower the price of goods that they only consume in order to derive their own interests. However, when the government provides public goods to all industries, there exist some possibilities that certain sectors with no organized representation are protected by import tariffs and certain other sectors that are represented by lobbies have export taxes imposed on them. The next proposition shows that this point is satisfied in our model.

Proposition 4.1 *Consider a situation in which the supply relative to the domestic demand of certain products is low enough. In this situation, the domestic price of that good may be set lower than the world price even if the industry is represented by lobbies. On the contrary, its domestic price may be set higher than the world price even if this good is produced in an unorganized industry.*

【Proof】 *See Appendix E.* ∎

This proposition can be explained as follows. The owners of organized sector-specific inputs require the government to exercise protectionism more than the owners of unorganized sector-specific inputs; however, the degree of such requirements reduces as the supply relative to the domestic demand of a product decreases. Therefore, the export taxation can be practiced even for a good produced in an organized sector when the import compared to its total domestic demand is high enough because the benefits of a protectionist trade policy are less than the losses. On the other hand, an import tariff can be practiced even for a good produced in an unorganized sector when the import compared to its total domestic demand is high enough because imposing protectionism results in more increases in the tariff revenue than losses.

In addition, I consider the situation where all industries are organized into lobbies.

Corollary 4.1 *In the the situation where all industries are organized into lobbies, the government practices free trade in all industries and, the equilibrium income tax rate and government size are equal to the level which is accomplished with no lobbying activities.*

This corollary can be easily confirmed by substituting equations (15) and (18) into $\beta(\mathbf{p}^{\circ}) = \alpha_L = I_j = 1$. In this situation, lobbying industries compete to pay contributions each other in order to their own interests; therefore such

competition results in free trade (that is $\mathbf{p}^\circ = \mathbf{p}^\circ$). Then, the amount of government spending is $H'(g^\circ) = 1$: that is equal to the level practiced in the case where there are no organized industries.

5 Concluding Remarks

In this paper, I studied the effects of carrying out lobbying activities on trade and fiscal policies and the relation between trade liberalization and government spending. Cameron (1978) and Rodrik (1998) indicated via empirical research the existence of a positive correlation between an economy's exposure to the international market and the government size. In contrast, my discussion, which is based on the political contribution approach developed by Grossman and Helpman (1994), focuses on the influence of lobbying practiced by industries on policymaking in order to gain protection. My research verifies that there exists a positive correlation between the openness in the markets of organized industries and the government size. However, it points out a negative correlation in unorganized industries because lobbying industries intend to drive politicians to compensate for losses due to free trade through government spending. Hence, it is very difficult to accomplish both the opening of an economy and reduction in government spending in the country where organized lobbies possess great power to influence incumbent officeholders.

In addition, I could also indicate that as the share of national income accruing to the organized sectors decreases, the equilibrium domestic price of a lobby's product is raised and that of a non-lobby's product is reduced. This statement is supported by an empirical study conducted by Ray (1981) in the US, which pointed out that the government tended to practice protectionist policies in industries where its market size was small enough or labor's average wage was sufficiently low. In other words, the wider the difference in the available income between organized and unorganized sectors, the more difficult it is for the country in which a large part of the industries are organized to exercise trade liberalization with other countries. Alesina and Wacziarg (1998) showed that the smaller countries have a larger share of public consumption in the GDP, and are also more open to trade. My result suggests that the expansion of the income difference may cause difficulties in trade liberalization; such a trend is already observed in only a part of the developed countries such as the US, Britain, and Japan, as well as in developing countries.

Moreover, I have considered the condition under which policymakers decide to protect producers or consumers. Here, I have been able to show that

the domestic price of the product in an organized sector may be set lower than the world price, while that in an unorganized sector may be set higher. This result is contrary to the findings of Grossman and Helpman (1994), and this condition depends on the share of import level in the total domestic demand for each product. A theoretical analysis of the lobbying activity and the economic policy have been discussed above extensively, but further consideration is required for greater empirical evidence. Therefore, this matter is left open to be dealt with in the future.

Appendix A: Comparative Statics

In this appendix, I consider the effects of fiscal and trade policies on social welfare and the welfare of each sector.

How much does a marginally change in the trade policy affect the social welfare and the welfare of each sector? First, a marginal change in the trade policy yields the following effect on the welfare of each sector:

$$\frac{\partial W_i}{\partial p_j} = (1-\tau)\delta_{ij} \cdot y_j(p_j) + \alpha_i \left[H'(g)[\tau \cdot y_j(p_j) + (p_j - p_j^*)m_j'(p_j) + m_j(p_j)] - d_j(p_j) \right], \tag{19}$$

where $\delta_{ij}$is an indicator variable that equals 1 if $i = j$ and 0 otherwise. Second, a marginal change in the trade policy causes the following effect on the welfare of all lobbies:

$$\sum_{i \in L} \frac{\partial W_i}{\partial p_j} = (1-\tau)I_j \cdot y_j(p_j) + \alpha_L \left[H'(g)[\tau \cdot y_j(p_j) + (p_j - p_j^* m_j'(p_j) + m_j(p_j)] - d_j(p_j) \right], \tag{20}$$

where $I_j \equiv \sum_{i \in L} \delta_{ij}$ is an indicator variable that equals 1 if $j \in L$ and 0 otherwise. Third, a marginal change in the trade policy results in the following effect on the social walfare:

$$\frac{\partial W}{\partial p_j} = (1-\tau)y_j(p_j) + H'(g)[\tau \cdot y_j(p_j) + (p_j - p_j^*)m_j'(p_j) + m_j(p_j)] - d_j(p_j). \tag{21}$$

I am also interested in investigating the manner in which a marginal change in the income tax rate affects the social welfare and the welfare of each sector. To begin with, a marginal change in the income tax rate has the following effect on the welfare of each sector:

$$\frac{\partial W_i}{\partial \tau} = \alpha_i \cdot H'(g) \cdot M(\mathbf{p}) - M_i(p_i). \tag{22}$$

Next, a marginal change in the income tax rate has the following effect on the welfare of all lobbies:

$$\sum_{i\in L}\frac{\partial W_i}{\partial \tau}=\alpha_L\cdot H'(g)\cdot M(\mathbf{p})-\sum_{\imath\in L}M_i(p_i). \tag{23}$$

Finally, a marginal change in the income tax rate causes the following effect on the social welfare:

$$\frac{\partial W}{\partial \tau}=[H'(g)-1]M(\mathbf{p}). \tag{24}$$

Appendix B: Proofs of Main Propositions and Lemmas

Proof of Proposition 3.1

【Proof】 *Differentiating $G(.)$ with respect to p_j using equation (15), the following equation is led,*

$$\frac{\partial g^\circ}{\partial p_j^\circ}=\frac{G'(.)}{\alpha_L+a}\cdot\frac{\partial \beta}{\partial p_j^\circ}, \tag{25}$$

where $\frac{\partial \beta}{\partial p_j^\circ}=\frac{[I_j\cdot M(\mathbf{p}^\circ)-\sum_{i\in L}M_i(p_i^\circ)]y_j(p_j^\circ)}{(M(\mathbf{p}^\circ))^2}$. Hence, we can obtain the following results:

$$\textit{If } j\in L,\ \textit{then } \frac{\partial g^\circ}{\partial p_j^\circ}=\frac{G'(.)}{\alpha_L+a}\left[\frac{[M(\mathbf{p}^\circ)-\sum_{i\in L}M_i(p_i^\circ)]y_j(p_j^\circ)}{(M(\mathbf{p}^\circ))^2}\right]<0. \tag{26}$$

$$\textit{If } j\notin L,\ \textit{then } \frac{\partial g^\circ}{\partial p_j^\circ}=-\frac{G'(.)}{\alpha_L+a}\cdot\frac{\sum_{i\in L}M_i(p_i^\circ)\cdot y_j(p_j^\circ)}{(M(\mathbf{p}^\circ))^2}>0. \tag{27}$$

because of the concavity of G(.). This is can be used to prove proposition 3.1. ∎

Proof of Lemma 3.2

【Proof】 *Differentiating equation (16) with regard to the domestic price of good j, the next equation is derived:*

$$\frac{\partial \tau^\circ}{\partial p_j^\circ}=\frac{\left[\frac{G'(.)}{\alpha_L+a}\cdot\frac{\partial \beta}{\partial p_j^\circ}-(p_j^\circ-p_j^*)m_j'(p_j^\circ)-m_j(p_j^\circ)\right]M(\mathbf{p}^\circ)-T(\mathbf{p}^\circ)\cdot y_j(p_j^\circ)}{(M(\mathbf{p}^\circ))^2}. \tag{28}$$

If the numerator of the fraction on the right side of equation (28) is positive (negative), the value of this equation will also be positive (negative) because $(M(\mathbf{p}^\circ))^2 > 0$. *Focusing on* $m_j'(.) < 0$, *I can confirm that*

$$\frac{\partial \tau^\circ}{\partial p_j^\circ} \gtreqless 0 \Leftrightarrow p_j^\circ - p_j^* \gtreqless \frac{\left[\dfrac{G'(.)}{\alpha_L + a} \cdot \dfrac{\partial \beta}{\partial p_j^\circ} - m_j(p_j^\circ)\right] M(\mathbf{p}^\circ) - T(\mathbf{p}^\circ) \cdot y_j(p_j^\circ)}{m_j'(p_j^\circ) \cdot M(\mathbf{p}^\circ)}. \tag{29}$$

I can derive lemma 3.2 by summarizing the implication of the above condition (29). ∎

Proof of Lemma 3.3

【Proof】 *Letting* $p_j^\circ = f(\tau^\circ)$ *be the function that is led by equation (17), I can denote* $F(\tau^\circ, f(\tau^\circ))$ *of the transforming equation (17) as follows:*

$$F(\tau^\circ, f(\tau^\circ)) = 0. \tag{30}$$

Differentiating equation (30) with respect to τ° *implies that*

$$\frac{\partial F(\tau^\circ, p_j^\circ)}{\partial \tau^\circ} + \frac{\partial F(\tau^\circ, p_j^\circ)}{\partial p_j^\circ} f'(\tau^\circ) = 0. \tag{31}$$

Paying attention to satisfy the equation $f'(\tau^\circ) = \frac{\partial p_j^\circ}{\partial \tau^\circ}$, *I can lead*

$$\frac{\partial p_j^\circ}{\partial \tau^\circ} = \frac{\dfrac{\partial F(\tau^\circ, p_j^\circ)}{\partial \tau^\circ}}{\dfrac{\partial F(\tau^\circ, p_j^\circ)}{\partial p_j^\circ}}. \tag{32}$$

Here, I can confirm that $\frac{\partial F(\tau^\circ, p_j^\circ)}{\partial \tau^\circ} > 0$. *Hence, the next condition is satisfied,*

$$\frac{\partial p_j^\circ}{\partial \tau^\circ} \gtreqless 0 \Leftrightarrow \frac{\partial F(\tau^\circ, p_j^\circ)}{\partial p_j^\circ} \lesseqgtr 0 \Leftrightarrow H'(g^\circ) \lesseqgtr \frac{I_j + a}{\alpha_L + a}. \tag{33}$$

By using equation (15) and since $0 \leq \beta(\mathbf{p}) \leq 1$, *it is shown that*

$$\textit{If } j \in L, \textit{ then } \frac{\partial p_j^\circ}{\partial \tau^\circ} \geq 0. \tag{34}$$

$$\textit{If } j \notin L, \textit{ then } \frac{\partial p_j^\circ}{\partial \tau^\circ} \leq 0. \tag{35}$$

These inequalities indicate the content of lemma 3.3. ∎

Proof of Proposition 4.2

【Proof】 *From equation (18), I can easily confirm that the denominator of the fraction on the right side of this equation is always negative. From this standpoint, if the numerator of this fraction is positive (negative), then the value of this equation will also be positive (negative). Hence, I can easily lead the conditions so as to satisfy* $p_j^\circ \gtreqless p_j^*$ *as follows:*

$$p_j^\circ \gtreqless p_j^* \Leftrightarrow$$

$$\text{if } j \in L, \text{ then } \frac{y_j(p_j^\circ)}{d_j(p_j^\circ)} \gtreqless \frac{M(\mathbf{p}^\circ)[\alpha_L - \beta(\mathbf{p}^\circ)]}{[M(\mathbf{p}^\circ) - T(\mathbf{p}^\circ)][1 - \beta(\mathbf{p}^\circ)]}, \tag{36}$$

$$\text{if } j \notin L, \text{ then } \frac{y_j(p_j^\circ)}{d_j(p_j^\circ)} \lesseqgtr \frac{M(\mathbf{p}^\circ)[\beta(\mathbf{p}^\circ) - \alpha_L]}{[M(\mathbf{p}^\circ) - T(\mathbf{p}^\circ)]\beta(\mathbf{p}^\circ)}. \tag{37}$$

These conditions imply the statements summarized in proposition 4.2. ∎

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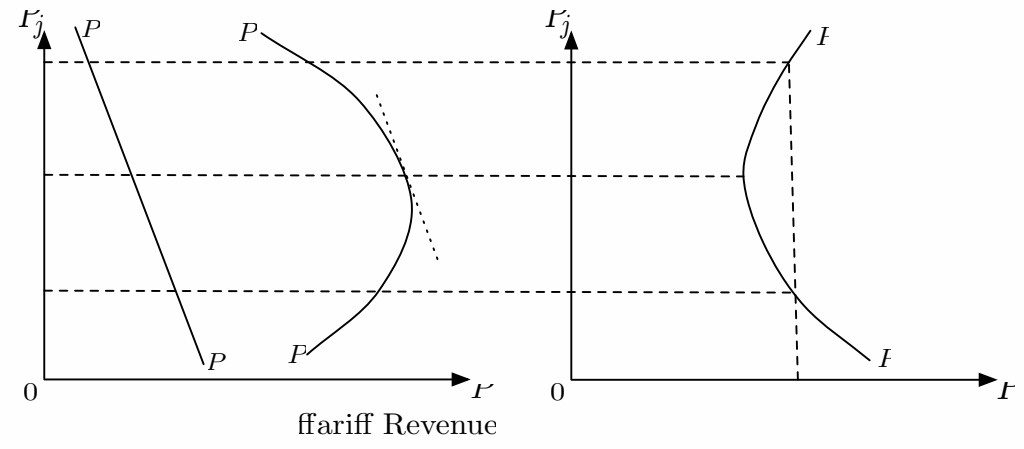

Figure 1: The Relation between the Domestic Price of Lobby's Product and the Tariff Revenue

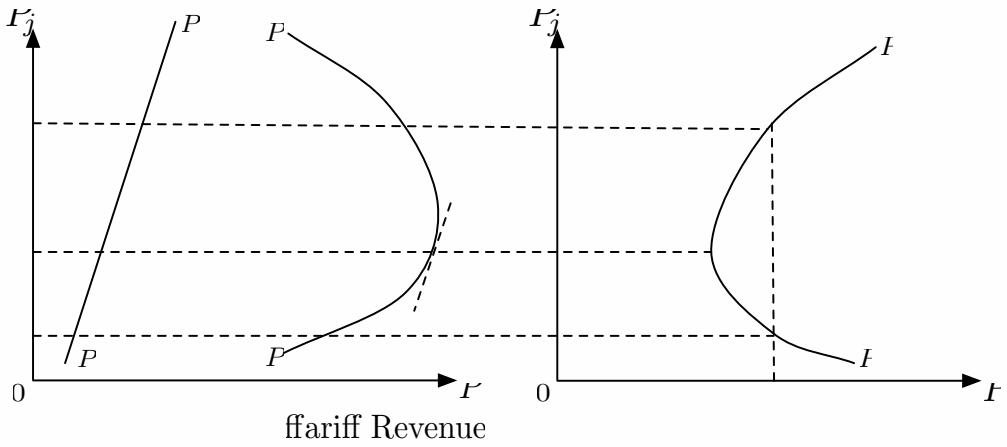

Figure 2: The Relation between the Domestic Price of Non-Lobby's Product and the Tariff Revenue

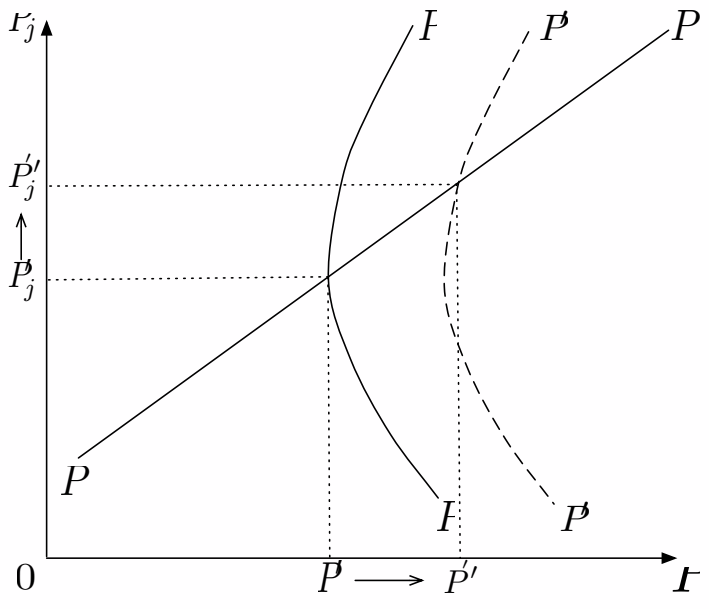

Figure 3: The Decrease in the Income Per Capita of Lobby Members Compared to the Social Average Income (the Case in Lobby's Product)

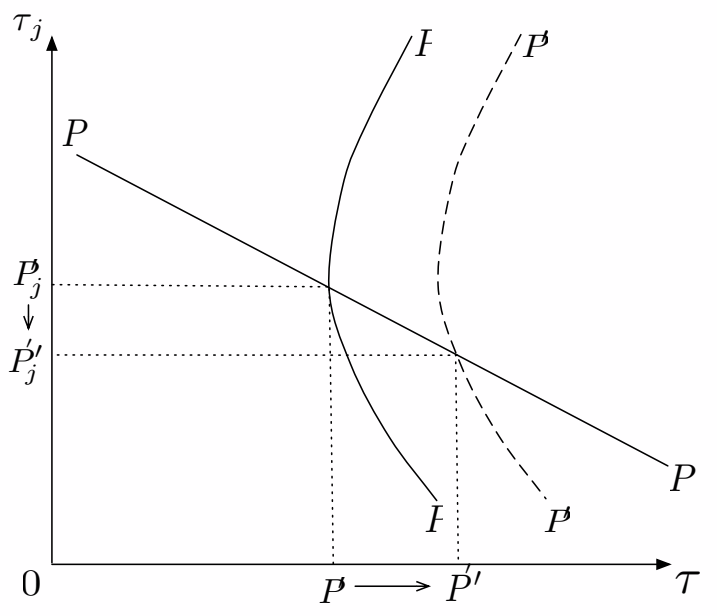

Figure 4: The Decrease in the Income Per Capita of Lobby Members Compared to the Social Average Income (the Case in Non-Lobby's Product)