THE KOREAN ECONOMIC REVIEW
Volume 19, Number 1, Summer 2003

TARIFF PROTECTION REVISITED: IMPLICATIONS FOR STRATEGIC IMPORT TARIFF

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This paper employs the influence-driven approach to analyze the impact of lobbying on the strategic trade policy in a model of Cournot duopoly. That is to extend the analysis of Brander and Spencer(1984). When an industry special interest group lobbies the domestic government for trade protection, the politically sustainable equilibrium level of protection is higher than the optimal strategic level. This implies that the presence of lobbying reinforces the argument for strategic intervention designed to capture profits from rival foreign firms(or industry). This paper also shows that under various scenarios with different political conditions the politically-determined tariffs are always higher than the optimal-shifting tariff.

JEL Classification: F12, F13
Keywords: Lobbying, Political equilibrium tariff, Equilibrium contribution

I. INTRODUCTION

Domestic political pressure has been pointed to as an underlying cause of trade restrictions generally. Krugman(1987, p.14) has written that 'an effort to pursue efficiency through intervention could be captured by special interests and turned into an inefficient redistribution program'. Similarly, Grossman(1987, p.65) argues that 'experience has shown that the trade policy apparatus is susceptible to the political pressures'. In contrast to the traditional commercial policy models that analyze trade policy in terms of economic efficiency on trade policy, a considerable share of the recent literature is based on distributional considerations. In these endogenous protection models, self-interested politicians use trade policy to transfer income to particular interest groups.[1]

Received for publication: March 17, 2003. *Revision accepted:* June 9, 2003.

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[1] See Rodrik(1995) for an excellent survey of the endogenous protection literature, or

In a representative democracy, as a matter of fact, government is not viewed as a benevolent social welfare maximizer; it is rather composed of politicians pursuing political interests: reelection perhaps. Therefore, as in several alternative political economy approaches(Findlay and Wellisz, 1982; Hillman, 1982, 1989; Mayer, 1984; Magee, Brock and Young, 1989; Grossman and Helpman, 1994 etc.), the decision to restrain trade must be viewed in the light of (i) the pressures that domestic interest groups bring to bear on the trade regulating authorities or (ii) the voting behavior of individuals whose incomes differ according to their ownership of labor and shares in profits. Recently, some empirical studies support the endogenous protection models by finding strong evidence that protection is indeed 'for sale' (see, in particular, Gawande, 1998; Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000). In short, the politically sustainable level of trade protection cannot be evaluated sorely on the basis of its economic merits from a social welfare point of view, but it also needs to incorporate the political motives of the concerned special interest groups.

This paper investigates the choice of tariffs by a government motivated by political concerns. That is, the strategic tariff policy suggested influentially by Brander and Spencer(1984) is reexamined in the presence of lobbying.[2] An important, but omitted aspect in the strategic trade policy literature is that imperfect competition provides a clear motivation for the domestic firms to engage in lobbying. Despite the existence of a natural overlap between the strategic trade policy literature and the lobbying literature, little effort has been made so far to combine these two literatures. But there is one notable exception. Moore and Suranovic(1993) analyze the impact of lobbying in a model of Cournot duopoly. On that point, their motivation is the same as ours. Our model, however, differs from Moore and Suranovic's in two important respects. First, Moore and Suranovic focus only on the export subsidy, whereas we deal with the import tariff. Secondly, Moore and Suranovic use a general lobbying function, in which lobbying incurs real resource cost, while the lobbying game presented below is based on the menu-auction model developed first by Bernheim and Whinston(1986) and later used by Grossman and Helpman(1994) in the trade policy context.[3]

Vousden(1990) and Magee(1994).

[2] By showing that, in the presence of imperfect competition, tariff can shift profit from foreign to domestic firms, and to the domestic treasury in the form of tariff revenue, Brander and Spencer(1984) extended our understanding of motives that might underlie tariff policy. See Brander(1995) for a review of strategic trade policy.

[3] Grossman and Helpman's approach is what is called the influence-driven approach in the political economy of trade literature. That approach envisions a sort of auction in which interest groups buy policies by offering contributions contingent on the policies followed by an incumbent government. It stems from the empirical observation that special interest groups often try to use campaign contributions to influence politicians' positions. For more details, see Grossman and Helpman(1994)

It is the purpose of this paper to extend the analysis of Brander-Spencer(1984) by allowing industry special interest group to lobby for protection. To determine the equilibrium policy outcome, we rely on the political economy of trade framework developed by Grossman and Helpman(1994). In particular, we derive the tariff formulas that can be viewed as equilibria in the political market. It is shown that the politically-determined tariffs are higher than the rent-shifting import tariff. With the political equilibrium tariffs, the implications of lobbying for strategic tariff policy are also discussed. It is also found that free trade is restored as an optimal policy choice even under imperfect competition under appropriate political condition. In addition, using the model presented we will analyze some interesting questions such as the problem of lobbying on social welfare in case of no benevolent government, policy reform conditionality and bargaining between industry special-interest group and an incumbent government.

The remainder of the paper is organized as follows. In section 2 we describe the basic model. In section 3 various effects of tariff are presented. The optimum tariff and welfare effects in the absence of lobbying are described in section 4, while the equilibrium policies in the presence of lobbying are characterized in section 5. Section 6 discusses some interesting questions within the context of the model presented. Finally, some concluding remarks will be provided in the last section.

Ⅱ. THE MODEL

Consider a small open economy with two sectors, which could be labelled as manufacturing and agriculture(numeraire). To capture implications of strategic import tariff policy we assume that the manufacturing sector is an import-competing industry. The import-competing industry produces a good with two factors of production, labor and capital, while the agriculture sector produces numeraire good with constant returns to scale technology using only labor. Labor is mobile across sectors and supplied inelastically.[4]

Total population is normalized to one. A fraction α of the population owns the capital used in the importing-competing industry and do not need to work as wage earners to make a living. These individuals are organized in interest group(a producer's association) for political activity.[5] The remaining $1-\alpha$ (hereafter β) individuals are the owners of the mobile factor, which are used in both manufacturing and agriculture sectors, and earn a fixed return which is normalized to one. They are assumed to be inactive politically.[6]

[4] As long as the agriculture sector is active, the constant marginal product of the migrant factor fixes its economy-wide return to unity.

[5] The importing-competing industry has an incentive to lobby for more protection whenever possible. This argument is verified in section 4.

[6] Assuming that both workers and capital owners in manufacturing sector are organized in

Like Brander and Spencer(1984a, b), we assume that the manufacturing industry consists of one domestic and one foreign firm. A domestic firm(DF) and a foreign firm(FF) produce a homogeneous good, x and y, respectively, for sale in the domestic market under Cournot competition.[7] The domestic government(DG) imposes the specific import tariff t to the FF.

The DF and FF maximize its profit π^d and π^f, respectively.

$$\begin{aligned} \pi^d &= p(x+y)x - c^d(x) \\ \pi^f &= p(x+y)y - c^f(y) - ty \end{aligned} \tag{1}$$

where c^j $(j=d,f)$ is the cost of the DF and FF producing x and y, respectively; $p(\cdot)$is the current price in the domestic market(Strictly speaking, it is the domestic relative price of the manufactured good in terms of the price of the numeraire good which is normalized to unity).

We also assume that all individuals in the domestic country have the same preferences over consumption goods, represented by the following objective function:

$$U^i = m^i + u(q^i), \quad i=k,l \tag{2}$$

where i represents capital owners and workers belonging to two sectors, U^i is the utility level of inividual i, m^i is his or her consumption of a competitively produced numeraire good, and q^i is his or her consumption of the duopoly good; $q^i = x^i + y^i$.[8] The subutility function $u(\cdot)$ is differentiable, increasing, and concave. Utility is maximized subject to the budget constraint:

$$I^i \geq m^i + pq^i \tag{3}$$

where I^i is the net income of individual i, to be defined below. Given the specification chosen for the utility function U^i, it follows that consumption of the manufactured good does not depend on income:[9]

$$q^i = Q(p) \quad \forall i, \quad Q_p < 0 \tag{4}$$

interest groups, Rama and Tabellini (1998) investigate the joint determination of product and labor market distortions in a small open economy.

[7] Since we assume that each country has one firm producing an identical good for sale in the domestic market only, a firm and a industry can be used interchangeably.

[8] Since we assume that individuals belong to one of two factor groups, workers consume under identical preferences with the fixed return normalized to one, and capital owners have the same interest in import protection as interest group for political activity, individual i can be also taken as a representative individual or group.

[9] Namely, the inverse demand function can be written as $p = P(q^i) \equiv u'(q^i)$.

All subscripts denote derivatives. From (2) and (3), the indirect utility function of each group takes the form:

$$V^i = I^i + u(Q) - pQ = I^i + CS(p) \tag{5}$$

where CS is the consumer surplus derived from consuming duopoly good.

Individuals belonging to different groups differ in their net income. We assume that tariff revenues are redistributed uniformly only to the members of interest group, capital owners.[10] Thus each capital owner in the manufacturing sector receives a proportion $1/\alpha > 1$ of per capita tariff revenue. Now the net income of capital owners consists of the government transfer and profits.

$$I^k = \frac{\pi^d}{\alpha} + \frac{ty}{\alpha} \tag{6}$$

By assumption, the workers belonging to the manufacturing and the numeraire sectors only receive wage income. Therefore, the net individual income of workers is

$$I^l = \frac{M}{\beta} \tag{7}$$

where M is the total wage income.

Substituting (6) and (7) into (5), the gross indirect utility functions for each individual in each group are given by

$$\begin{aligned} V^k &= \frac{\pi^d}{\alpha} + \frac{ty}{\alpha} + CS(p) \\ V^l &= \frac{M}{\beta} + CS(p) \end{aligned} \tag{8}$$

Taking the import tariff set by the DG as given, indirect utility function identifies the utility level that an individual in group i can attain in the absence of any political contributions.

Ⅲ. COMPARATIVE STATIC EFFECTS

The DF and FF will Cournot-compete, taking the tariff level as given. Two first-conditions for x and y in (1) characterize the reaction functions of the DF

[10] This assumption is based on the preceding assumption that agricultural workers do not make any contributions to influence trade policy outcomes. If we assume that two groups are equally effective in influencing government policy, it would be reasonable to assume that revenues is distributed evenly across the whole population.

and FF to each other's output in the domestic market. If the second-order and stability conditions for the Cournot-Nash equilibrium levels of output are satisfied, then these two equations implicitly yield output levels as functions of the domestic tariff $x=x(y(t),t)\equiv x(t)$ and $y=y(x(t),t)\equiv y(t)$.[11] Moreover, equilibrium profits are $\pi^d(t)=\pi^d(x(t),y(t))$ and $\pi^f(t)=\pi^f(x(t),y(t),t)$, and the equilibrium domestic price is $p(t)=P(x(t)+y(t))$. If the tariff is non-prohibitive level, (9) and (10) are derived

$$\begin{aligned}\frac{d\pi^d(t)}{dt} &= \pi_x{}^d x_t+\pi_y{}^d y_t \\ &= p'\cdot x\cdot y_t>0\end{aligned} \tag{9}$$

since $\pi_x{}^d=0$ by the first-order condition, $p'<0$ and $y_t<0$.

$$\begin{aligned}\frac{d\pi^f(t)}{dt} &= \pi_x{}^f x_t+\pi_y{}^f y_t+\pi_t{}^f \\ &= p'\cdot y\cdot x_t-y<0\end{aligned} \tag{10}$$

As expected, higher domestic import tariff increases the profit of the DF and reduces the profit of the FF. Also, with the stability conditions it follows that $p_t=p'(x_t+y_t)>0$. With the stability conditions for the Nash equilibrium in footnote 9, let's put the comparative static effects together: As the tariff rises, the FF's reaction function shifts inward, raising local production and shrinking the level of exports by the FF to the domestic market. Moreover, as the FF withdraws from the market, only some of the slack is taken up by the DF. The DF produces more but does not raise production by as much as the imports have fallen. Hence the domestic consumption falls with a rise in the tariff, domestic prices rise, and DF's profits increase.

Ⅳ. THE OPTIMUM TARIFF AND WELFARE EFFECTS UNDER A BENEVOLENT GOVERNMENT

Before discussing the political game of the model, it is useful to derive a benchmark for comparison. Consider the equilibrium in which the DG and the DF do not collaborate politically. As a benevolent social welfare maximizer,

[11] Stability conditions for the Cournot-Nash eqilibrium is ensured by requiring that each firm's marginal revenue declines when the output of its rival rises. That is, $\pi_{xy}{}^d<0$ and $\pi_{yx}{}^f<0$. Notice that $\pi_{xx}{}^d<\pi_{xy}{}^d$ and $\pi_{yy}{}^f<\pi_{yx}{}^f$. Then $\Delta=\pi_{xx}{}^d\pi_{yy}{}^f-\pi_{xy}{}^d\pi_{yx}{}^f>0$. Together these imply that $x_t=-\pi_{xy}{}^d/\Delta>0$, $y_t=\pi_{xx}{}^d/\Delta<0$, $x_t+y_t=(\pi_{xx}{}^d-\pi_{xy}{}^d)/\Delta=p'/\Delta<0$(a tariff reduces domestic consumption relative to free trade). For more details, see Tirole(1988) or Brander and Spencer(1984b).

government would never deviated from the optimum tariff that maximizes social welfare. We assume that the DG initiates a tariff program by announcing an initial tariff, but does not take the DF's lobbying for trade protection into account. The DG's objective function is given by:

$$\begin{aligned} Max_t\ G &= \alpha V^k + \beta V^l \\ &= \pi^d + M + ty + CS \end{aligned} \tag{11}$$

where G is the (utilitarian) social welfare levels that could be attained in the absence of any political coalition. Domestic welfare is maximized when G_t is equal to zero.

$$\begin{aligned} G_t &= \alpha V_t{}^k + \beta V_t{}^l \\ &= \pi_t{}^d + y + ty_t + CS_t = 0 \end{aligned}$$

A useful rearrangement yields the optimum tariff (i.e., the 'optimal profit-shifting tariff') t^* that maximizes social welfare:

$$t^* = \frac{\pi_t{}^d + y + CS_t}{-y_t} \tag{12}$$

where $CS_t = -p_t \cdot Q < 0$

Since $\pi_t{}^d = p_t x + px_t - c_x^d x_t$, we can also write (12) as

$$t^* = \frac{(1-p_t)y + (p-MC)x_t}{-y_t}$$

where $MC = c_x^d$.

This expression is of the same form as the optimal tariff derived in Brander-Spencer(1984). The sign of t^* depends on $p_t \lessgtr 1$, since the second term in numerator is positive and $y_t < 0$. As noted in the Brander and Spencer (1984a, b), the optimal tariff can be positive, zero or negative depending on the relative convexity of demand.[12] We do not go into details here because it is not the focus of this paper.

[12] t^* is negative if $p_t > 1$, so that an increase in the subsidy causes price to fall by more than the subsidy. This condition is eqivalent to the requirement that demand be too convex in order for a negative tariff.

Let's turn next to the welfare effects of tariff on individuals belonging to each group. By evaluating the welfare at the optimal tariff level, we can determine the positions that individuals will take regarding the implementation of the tariff policy. Setting $V_t^i = 0$ $(i = k, l)$ in (8) and substituting (12) into that equation yields individuals' welfare in each group at the optimal tariff level as follows.

$$V_t^k \mid_{t=t^*} = \frac{\alpha - 1}{\alpha} CS_t > 0; \quad V_t^l \mid_{t=t^*} = CS_t < 0 \tag{13}$$

Eq.(13) helps us identify the gainers and the losers from higher level of import tariff. As expected, an increase in the import tariff at the optimal tariff level increases the capital owners' welfare, but decreases the workers' welfare. That is, capitalists in manufacturing are gainers from more import protection. This is why they organize as interest group and participate in lobbying in order to influence a government's choice of policy. This plausible feature of the model is reflected in the properties of the equilibrium described in the remainder of the paper.

V. EQUILIBRIUM POLICY UNDER LOBBYING

In this section we characterize the equilibrium policy in the presence of lobbying. Since they always benefit from a higher tariff, as seen before, capital owners in the DF may solicit the government for the further trade protection. The government also may solicit them for political contributions. Therefore, both the DF and the government have incentives to collaborate. We assume that capitalists lobby the DG directly.[13] Workers, as we assumed, do not engage in lobbying activities to influence economic policy outcomes.

5.1 Political equilibrium tariff

Now, the DG cares about aggregate well-being, but also about the total level of political contributions it gets from capital owners.[14] The government values contributions, because they can be used to finance campaign spending or they may provide other direct benefits(bribes) to the officeholders. Social welfare will be of concern to the incumbent government if voters are more likely to reelect a government that has delivered a high standard of living. Following Grossman-

[13] In addition to lobbying, import-competing industries can petition for import relief through rules-oriented 'administered protection' procedure (e.g. antidumping, countervailing duty, safeguard actions, etc.). For industry choice between two protections, see Moore and Suranovic (1992).

[14] The political contributions are expressed as a function of the name of 'contribution schedules', namely function mapping the economic policy into actions valued by the government. These actions admit several alternative interpretations: they can be bribes, campaign contributions, or support demonstrations.

Helpman(1994), we choose an additive form for the political-support function Ω,

$$\begin{aligned}\Omega &= (G-\lambda) + \theta\lambda \\ &= G+(\theta-1)\lambda, \quad \theta > 1\end{aligned} \tag{14}$$

where G is the aggregate social welfare level defined before, λ represents political contribution schedule, which is contingent on the chosen trade policies and differentiable at t, and the parameter θ indicates how the government values political contributions (or the 'value' of political contributions) relative to social welfare.[15] As pointed by Grossman-Helpman(1994), $\theta > 1$ means government politicians value \$1 worth of political contributions more highly than \$1 in the hands of the public. Therefore, $\theta-1$ represents the net benefit for the government of receiving \$1 of political contributions.

The political game follows Grossman-Helpman framework which is based on the menu-auction model of Bernheim-Whinston(1986). Thus, the timing of the game is as follows: first, capital owners in the manufacturing sector, as the bidder, make political contributions to the government based on the policies the government adopt. Next the government, as the auctioneer, chooses its policy stance to maximize weighted sum of social welfare and contributions. An equilibrium requires two conditions, namely, (i) that the lobby group offers a contribution schedule which maximizes the well-being of its members, and (ii) that government chooses a policy outcome which maximizes its political objective given the contribution schedule offered by the lobby. Thus equilibrium policy is optimal for the government and for the interest group, given the equilibrium contributions.

In equilibrium, capital owners make contributions up to the point where the marginal benefit from the resulting change in tariff level exactly equals the marginal cost of the contributions. Therefore the contribution schedule of the lobby group must satisfy

$$aV_t^k = \lambda_t(t) \tag{15}$$

Contribution schedule that is differentiable at least around its equilibrium point, is referred to as 'locally truthful' (Bernheim and Whinston, 1986). This means that in the neighborhood of the equilibrium the contribution schedule reflects the true preference of the lobby group and is stable to non-binding communication among the players (i.e., they are 'coalition-proof').[16]

[15] The welfare weight parameter (a) in Grossman-Helpman(1994), is just to $1/\theta-1$ here. For an alternative specification of the political process see for example Magee et al. (1989).

[16] Local truthfulness is an important property of this model. It provides a microeconomic justification for modeling the government's behavior as maximizing a social welfare function that weights different members of society differently. See Grossman-Helpman(1994) for details.

Using (14) and (15), we can get the politically optimal tariff in the presence of lobbying. That is, the first-order condition of the DG's optimization problem is:

$$\Omega_t \equiv G_t + (\theta - 1)\lambda_t(t) = 0 \tag{16}$$

Combining (15), and recalling the definition of the social welfare function G in (11), the solution to the DG's optimization problem can be rewritten as:

$$\Omega_t = \theta\alpha V_t^k + \beta V_t^l = 0 \tag{17}$$

Therefore, the more the government values the contributions provided by the lobby group(i.e., the higher is the θ), the greater is the share of interest group in the DG's objective function. Differentiating (8) with respect to t and substituting them into above, we get the political equilibrium tariff $\hat{t}$.

$$\hat{t} = \frac{\pi_t^d + y + (\alpha + \beta/\theta)CS_t}{-y_t} \tag{18}$$

Eq.(18) denotes the level of protection determined by the political process. If the DG were a benevolent social planner and thus cares only about aggregate social welfare (then $\theta = 1$ in (14)), the political equilibrium tariff $\hat{t}$ reduces to the optimum tariff t^* before. Comparing (18) with (12) leads to the following proposition:

<Proposition 1> *With lobbying, the politically-determined equilibrium tariff is higher than the optimum level:* $t^* < \hat{t}$.

This result is due to the fact that the loss of consumer surplus is undervalued. The proposition 1 implies that the DF provides a political contribution that can sufficiently compensate the DG for its loss of workers.

With (15), Eq.(16) can be rewritten as

$$\Omega_t = \theta[\alpha V_t^k + \beta V_t^l] - \theta\beta V_t^l + \beta V_t^l = 0,$$

since $G_t = \alpha V_t^k + \beta V_t^l$.

This gives

$$G_t = \frac{(\theta - 1)\beta}{\theta} V_t^l < 0, \tag{19}$$

since $V_t^I < 0$.

Since G is the social welfare function, Eq.(19) reveals the direction of the equilibrium distortion. The distortion is proportional to the welfare effect of the tariff policy on the unorganized group, the workers. The constant proportionality depends on how much the DG values the contribution by the DF. In short, Eq.(19) means that the political equilibrium tariff is too high from the social welfare viewpoint.

Also, we can get immediately some intuitive comparative-static results from (18). Unlike the optimum tariff, the politically optimal tariff responds to changes in domestic political conditions, as summarized in the following proposition:

<Proposition 2> *The political equilibrium tariff rises as the government's valuation of political contributions increases; An increase in capital owners (workers) pushes down the politically optimal tariff.*

Proof. See the appendix.

In the proposition 2, the first and third results (i.e., comparative statics on θ and β in terms of the model notation) are illustrative, but the second one is not. It is surprising that an increase in α lowers the political equilibrium tariff. This situation, however, might arise if the consumption distortions become significant. Capital owners are also consumers and, as such, they suffer from market distortions. The bigger their group, the more they internalize the efficiency loss resulting from their lobbying. An alternative interpretation is possible in terms of pressure-group model (see Olson, 1965). That is, as the membership of a lobby group becomes larger, cost per contributor tends to increase because of the free-rider problem that accompanies size: because the benefit (higher tariff) obtained by a lobby group is available to all beneficiaries whether they contribute or not, there is an incentive for some members to free-ride. Anyway, the proposition 2 implies that domestic political factors could lead to a unilateral tariff changes.

Finally notice that free trade may be electorally optimal. With a restriction on p_t free trade is the policy that maximizes government's objective function.

<Corollary 1> If $1+\frac{(p-MC)x_t}{y} < p_t < \frac{y+(p-MC)x_t}{(\alpha+\beta/\theta)(x+y)-x}$, $\exists\, \theta \in [1, \infty)$ such that $\hat{t}(\alpha, \beta, \theta) = 0$.

Proof. See the appendix.

If the DG cares little for the profits of the DF, and receives much electoral benefit from ensuring a large consumer surplus, he/she may forgo the rent

shifted from abroad to the DF in favor of greater consumer surplus instead.

5.2 Equilibrium contribution

Now let's characterize the equilibrium contributions. Following Grossman-Helpman (1994), we only consider truthful contribution schedule.[17] Notice that a contribution schedule that everywhere reveals the true preferences is a truthful contribution schedule. Formally, a truthful contribution schedule takes the form:

$$\lambda(t,z) = Max[0,\ aV(t)^k - z] \tag{20}$$

where z is a scalar representing the reservation value. The truthful Nash equilibrium arises when the lobby group announces truthful contribution schedule. From the definition of a truthful contribution schedule, the net welfare to the DF will be z whenever it makes a positive contribution to the DG in equilibrium. Hence, the DF wishes to make z as large as possible (and the contribution as small as possible). However the DF must be careful not to raise z too large that the DG decides to adopt some alternative policy that might be damaging to its interests.

To sum up, the DF will raise its z to the point where the DG is just indifferent between taking the equilibrium contribution and taking no contribution at all and implementing the optimal policy of no intervention. By the way, we know that the DG would opt for free trade in the absence of any contributions from the DF. This indifferent relationship can be written as:

$$G(\hat{t}) + (\theta-1)\lambda(\hat{t},z) = G(t^*) \tag{21}$$

where $\hat{t} = \arg\max\ [G(t)+(\theta-1)aV^k(t)]$, and $G(t^*)$ is aggregate welfare at free trade. Combining (21) and (20) we obtain the equilibrium reservation utility for the DF:

$$(\theta-1)\hat{z} = G(\hat{t}) + (\theta-1)aV^k(\hat{t}) - G(t^*) \tag{22}$$

The first two terms on the right-hand side of (22) are a measure of the maximum gross welfare attainable by the DG and the DF. Thus, the equilibrium reservation utility equals the difference of the welfare attainable by the two coalitions consisting of the DG plus the DF and the welfare attainable by the DG alone (i.e., free trade).

[17] Only truthful contribution schedules support 'coalition proof' Nash equilibria, and vice-versa all such equilibria are reflected by truthful contributions. As mentioned above, a coalition proof Nash equilibrium is stable to non-binding communication among the players. See Bernheim-Whinston (1986) for details.

The reservation utility z measures the 'rent' that the DF can extract from the political process. The larger is z, the larger is the benefit resulting from the policy distortion that is appropriated by the DF rather than by the DG. It is possible to show that (22) implies $z>0$: in equilibrium the DF captures some rent from its political relationship with the DG.

After some algebra, we find the equilibrium contribution of the DF:

$$\lambda(\hat{t}, \hat{z}) = \frac{1}{(\theta-1)}[G(t^*) - G(\hat{t})] \tag{23}$$

It can be shown that the right-hand side of (23) is strictly positive. Eq.(23) implies that the DF contributes an amount that is proportional to the excess burden that the equilibrium tariff policy imposes on society. The factor of proportionality is the weight that DG attaches to aggregate gross welfare(relative to campaign contribution) in its own objective function. Inserting (23) in the DG's political objective function (14) yields

$$\Omega = G(t^*)$$

In the political equilibrium, therefore, the DG gets exactly the same utility as it would have achieved by allowing free trade. This is summarized as the following proposition.

<***Proposition 3***> *The DF captures all of the surplus from the agency relationship with the DG.*

This proposition holds only in the case of a single organized lobby.[18]

Ⅵ. SOME SPECIAL CASES

In section 5, we determined the politically sustainable level of trade protection, assuming that the industry special interest group can influence trade policy outcome through lobbying. But what happens to this equilibrium level of protection, when the domestic politics change? We can analyze some interesting problems in the context of the above model.

6.1 Government as political support maximizer and welfare effects

If the government is a benevolent social planner, lobbying cannot improve the domestic social welfare as described in section 4. A government, in some cases, can concern only about reelection.[19] Suppose that the DG only cares about the

[18] See Grossman-Helpman(1994) for details.

campaign contributions and the DF provides the contribution to influence government's policy decision. In this special case we can expect that the political equilibrium tariff will be higher than that in the case before. If so, would welfare deteriorate?

The government's objective function is now:

$$Max_t\ \Omega = \lambda(t)$$

The first-order condition gives

$$\begin{aligned}\Omega_t &= \lambda_t \\ &= \alpha V_t{}^k = 0\end{aligned}$$

After some algebra, we can get another political equilibrium tariff t^a, which is realized under a government seeking to maximize political support.

$$t^a = \frac{\pi_t{}^d + y + \alpha\, CS_t}{-y_t} \tag{24}$$

where the superscript "a" denotes the level of protection determined solely by the political contribution offered by the DF. This tariff t^a is equivalent to $\hat{t}$ before if $\theta \to \infty$ in (18).

Comparing (24) with (12) and (18), we have the following corollary:

<Corollary 2> $t^* < \hat{t} < t^a$

This result is very intuitive.

The welfare change due to the lobbying on tariff can be written as:

$$\begin{aligned}\Delta G &= G(t=t^a) - G(t=0) \\ &= [\pi^d(x,y:t=t^a) - \pi^d(x,y:t=0)] + t^a y + \\ &\quad [CS(t=t^a) - CS(t=0)]\end{aligned} \tag{25}$$

The first term in the right-hand side of (25) represents the extra profit earned by the DF. The second term measures the tariff revenues, and the third the consumer surplus loss. The direction of the welfare change depends on the magnitude of these three terms, and it is ambiguous. In view of our final

[19] In this case, what is called the cozy relations between politics and business can be arisen through lobbying by interest groups.

results, we can summarize results of this section in the following proposition:

*<**Proposition 4**> If the government cares only about the political support it gets from interest group, lobbying on import tariff sets the tariff higher than the optimal level, and domestic welfare can be improved when the extra rents transferred from the foreign rivalry is larger than the consumer surplus loss.*

6.2 The problem of policy reform conditionality

As noted before, lobbying on trade policy results in distortions from the social welfare viewpoint. In this section let us consider the problem of lessening the endogenous distorting policy by the external institution such as the IMF or the World Bank.[20] By making aid or sanctions conditional on economic policies, these organizations can be seen as an additional principal of the model, competing with capital owners in influencing economic policies. Within the context of the model presented we can infer the effect of policy conditionality.

We assume that the IMF is interested in improving the aggregate welfare of the member country. Let $L(t)$ be the conditional transfer from the IMF which is contingent on the chosen trade policy t. In this case the DG's objective function becomes

$$\Omega = G(t) + (\theta - 1)\lambda(t) + L(t) \tag{26}$$

The IMF's objective function, in turn, is

$$\Gamma(t) = G(t) + (1 - \varphi)L(t), \quad \varphi > 1 \tag{27}$$

where $\varphi > 1$ means the opportunity cost of funds.[21]

Suppose that the IMF and the DF simultaneously set their own loan schedule and the contribution schedule, respectively. Then the DF takes the loan L as given. Therefore, the DF's first-order condition remains the same as (15). On the other hand, the IMF's optimization problem gives

$$L_t = \frac{1}{\varphi - 1} G_t < 0, \tag{28}$$

since $G_t < 0$ in (19). The transfer should therefore be contingent on the tariff and put a premium on trade liberalization.

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[20] Since the late 1970s and early 1980s, the IMF and the World Bank have been working together to ease the financial crises and to promote more outward orientation in many less developed countries.

[21] If $\varphi = 1$, financing the loan would not be a problem, and the IMF would care only about aggregate welfare in the recipient country.

What is the effect of the conditionality on the domestic lobbying and thus distortion? The DG's first-order condition for maximization is

$$\Omega_t \equiv G_t + (\theta - 1)\lambda_t + L_t = 0 \tag{29}$$

Combining (15), (28) and (29), and recalling the definition of the social welfare function G in (11), the solution to the DG's optimization problem can be written as:

$$\Omega_t \equiv \tilde{\varphi}\,\alpha {V_t}^k + \beta {V_t}^l = 0 \tag{30}$$

with $\tilde{\varphi} = \dfrac{1+\theta(\varphi-1)}{\varphi}$ $(<\theta)$.

Comparing (30) with (17), we find that the IMF's policy conditionality reduces the influence of the lobby and reduces the distortions. But the structure of protection remains the same as before. That is, the political equilibrium tariff is equivalent to (18) except that the magnitude of consumer surplus loss is larger.

$$\tilde{t} = \frac{{\pi_t}^d + y + (\alpha + \beta/\tilde{\varphi})\,CS_t}{-y_t} \tag{31}$$

As the opportunity cost of the funds decreases, the influence of the domestic lobby vanishes and efficiency increases. In the limit, if $\varphi \to 1$(so $\tilde{\varphi} \to 1$), then conditionality would lead to first-best policy.

6.3 Bargaining problem between the players

Finally, we consider the problem on the policy negotiation between the DG and DF. Although collusion between politicians and special interests is illegal in most political systems, the bargaining between the domestic firms(or industries) and the government can be realized implicitly. That is, the DF and DG can bargain over the level of the DF's political contributions and trade protection.[22] The question we are interested in here is whether the bargaining power affects the equilibrium policy (the level of the political equilibrium tariff and the equilibrium contribution schedule). Now suppose that the DF and the DG bargain from the optimum tariff t^* in (12).[23] Then the net gains for the DF

[22] In this sense the spirit of the bargaining approach is similar to that of the political-contribution approach.

[23] The starting point for bargaining is t^*. When the DF and DG do not collaborate, the DG's objective function reduces to $\Omega = G$ in (14) (since $\lambda = 0$). Then it is straightforward to show that the starting-point level of tariff protection is equal to the optimum tariff t^*.

and the DG will be $\pi^d(t)-\lambda-\pi^d(t^*)$ and $\Omega-G(t^*)$, respectively.

The Nash bargaining solution solves the following maximization problem:

$$Max_{\lambda,t}\ [\pi^d(t)-\lambda-\pi^d(t^*)]^{\rho}[\Omega(t)-G(t^*)]^{1-\rho},\quad 0<\rho<1 \tag{32}$$

where ρ represents the bargaining power of the DF relative to the DG.

This maximization problem yields the political equilibrium tariff t^b and the equilibrium contribution λ^b under political bargaining process.

$$t^b = t^* + \frac{(\theta-1)\pi_t{}^d}{-y_t} \tag{33}$$

$$\lambda^b = (1-\rho)[\pi^d(t^b)-\pi^d(t^*)] + \frac{\rho}{\theta-1}[G(t^*)-G(t^b)] \tag{34}$$

where t^* is the optimum tariff given in (12).[24] Let us state this result in the following proposition:

*<**Proposition 5**> With bargaining, the political equilibrium tariff is higher than the optimum tariff:* $t^* < t^b$.

Whether or not Nash bargaining leads to a deal depends on: first, how much the DG can benefit from a political contribution $(\theta-1)$; and second, the size of the DF's economic stake($\pi_t{}^d$) there being a higher tariff. In the problem of comparison of two political equilibrium tariffs characterized by (18) and (33), we cannot tell which one is higher in the absence of specific assumptions on the functional form of preferences and technology, and on parameters. When the DF has full bargaining power, however, the equilibrium contribution in both cases is the same. In that sense, the equilibrium contribution given in (23) is one when the DG has no power in bargaining Nash solution.

Also, notice that unlike the equilibrium political contribution λ^b, the political equilibrium tariff t^b is independent of the DF's bargaining power. This implies that, since the political contribution can be treated as the net transfer within the domestic country, the objective of the political equilibrium tariff is to maximize the two parties' joint gains.[25]

[24] The derivation of these two expressions is given in the appendix.

[25] Two parties's joint gains can be written as $J(t) = G(t) + (\theta-1)\pi^d(t)$. From the first-order condition of $J(t)$'s maximization problem, we can derive the equilibrium tariff which is equivalent to (25).

Ⅶ. CONCLUDING REMARKS

Trade protection generally creates rents for the specific-factor owners in the protected sector, while an incumbent government, in a representative democracy, pursues reelection and thus may solicit them for political contributions such as campaign contributions or support demonstrations etc. In this sense, the interests of capital owners in the import-competing industry and a government are aligned in the cases of trade policies. Moreover, it is well known in the strategic trade policy literature that tariffs can shift some profits from foreign to domestic firms, and to the domestic treasury. It is clear that, from a purely domestic point of view, protection is likely to be an attractive policy. Therefore, a natural overlap exists between the strategic trade policy literature and the lobbying literature. Nevertheless, new literature to combine these two literatures is a little out of step with the rest of trade policy literature which has increasingly embraced political factors.

The aim of this paper is to redress the balance a little by analyzing the implications of including lobbying in a model of strategic trade policy. For this purpose, we adopt the analysis of Brander-Spencer(1984) and then allow an industry special-interest group to lobby for protection. In particular, when an incumbent government maximizes its own welfare, which depends on total contributions collected and on the social welfare, what is the politically sustainable equilibrium level of protection? This paper addresses this question.

The level of trade protection without lobbying is the same as the optimal strategic policy by Brander-Spencer(1984). But when an industry special interest group(capital owners in the import-competing industry) lobbies the domestic government for trade protection, the politically sustainable level of protection is higher than the optimal strategic level. This implies that the presence of lobbying reinforces the argument for strategic intervention designed to capture profits from rival foreign firms(or industry). This paper also shows that under various scenarios with different political conditions the politically-determined tariffs are always higher than the optimal-shifting tariff. But the policy conditionality by foreign organizations reduces the influence of the lobby.

In this paper I set up the very simple model to focus on the strategic trade intervention. Additional complications are likely to arise if multiple lobby groups are considered. For, example, workers can also politically organized in the context of the present model. Furthermore, even workers belonging to different sector may have different interests. Under various scenarios, the argument for intervention can be reexamined. So long as a government has its own political objective, however, the basic point derived in this paper is likely to hold. In spite of the paper's limitations I hope that I have offered some insight into the nature of the politico-economic equilibrium in the political market around strategic trade policies.

APPENDIX

Proof of proposition 2. As shown in (16), the first-order condition of the government's optimization problem is:

$$H_t(t, \theta, \alpha, \beta) \equiv \pi_t{}^d + y + ty_t + (\alpha + \beta/\theta)CS_t = 0 \tag{A1}$$

After totally differentiating (A1) with respect to θ, it is shown that

$\frac{d\hat{t}}{d\theta} = \frac{H_{t\theta}}{-H_{tt}} = \frac{-\beta CS_t/\theta^2}{-H_{tt}} > 0$, since $CS_t < 0$ and $H_{tt} < 0$ by the second-order condition for the maximization.

Similarly,

$$\frac{d\hat{t}}{d\alpha} = \frac{H_{t\alpha}}{-H_{tt}} = \frac{CS_t}{-H_{tt}} < 0, \text{ and}$$

$$\frac{d\hat{t}}{d\beta} = \frac{H_{t\beta}}{-H_{tt}} = \frac{CS_t/\theta}{-H_{tt}} < 0. \qquad \text{Q.E.D.}$$

Proof of corollary 1. From (18), $\hat{t}(\alpha, \beta, \theta) > 0$ if $p_t < \frac{y + (p - MC)x_t}{(\alpha + \frac{\beta}{\theta})(x + y) - x}$.

Also, $p_t > 1 + \frac{(p - MC)x_t}{y} \Rightarrow \hat{t}(\alpha, \beta, 1) = \frac{\pi_t^d + y + CS_t}{-y_t} < 0$. By the intermediate value theorem, $\exists\, \theta \in [1, \infty)$ s.t. $\hat{t}(\alpha, \beta, \theta) = 0$. Of course, it is easily verified that the range of p_t holds. Q.E.D.

Proof of Eqs.(33) and (34). The maximization problem for Nash bargaining is

$$\Psi = Max_{\lambda, t}\, [\pi^d(t) - \lambda - \pi^d(t^*)]^{\rho} [G(t) + (\theta - 1)\lambda - G(t^*)]^{1-\rho} \tag{A2}$$

Let $A = \pi^d(t) - \lambda - \pi^d(t^*)$ and $B = G(t) + (\theta - 1)\lambda - G(t^*)$.

Maximizing Ψ with respect to λ yields the first-order condition:

$$\Psi_\lambda = -\rho A^{\rho - 1} B^{1-\rho} + (1 - \rho) A^{\rho} B^{-\rho} (\theta - 1) = 0$$

$$\Rightarrow (1-\rho)(\theta-1)A-\rho B=0, \text{ since } A^{\rho}B^{-\rho}\neq 0,\ A\neq 0. \tag{A3}$$

$$\Rightarrow (1-\rho)(\theta-1)[\pi^{d}(t)-\lambda-\pi^{d}(t^{*})]-\rho[G(t)+(\theta-1)\lambda-G(t^{*})]=0$$

Let t^{b} be the solution which satisfies the above equality. Then solving for the equilibrium contribution λ^{b} yields (34).
Also, given λ, maximizing (A1) with respect to t yields

$$\Psi_{t}=\rho A^{\rho-1}A_{t}B^{1-\rho}+(1-\rho)A^{\rho}B^{-\rho}B_{t}=0$$

$$\Rightarrow\ \rho BA_{t}+(1-\rho)AB_{t}=0, \text{ since } A^{\rho}B^{-\rho}\neq 0,\ A\neq 0. \tag{A4}$$

From (A3), $\rho B=(1-\rho)(\theta-1)A$.
Substituting this expression into (A4) yields

$$(1-\rho)A[(\theta-1)A_{t}+B_{t}]=0$$

$$\Rightarrow\ (\theta-1)A_{t}+B_{t}=0$$

Since $A_{t}=\pi_{t}{}^{d}$ and $B_{t}=G_{t}=\pi_{t}{}^{d}+y+ty_{t}+CS_{t}$, it follows that

$$(\theta-1)\pi_{t}{}^{d}+\pi_{t}{}^{d}+y+ty_{t}+CS_{t}=0$$

Solving for the political equilibrium tariff t^{b} yields (33). Q.E.D.

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