Volume Title: Import Competition and Response

Volume Author/Editor: Jagdish N. Bhagwati, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-04538-2

Volume URL: http://www.nber.org/books/bhag82-1

Publication Date: 1982

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Chapter URL: http://www.nber.org/chapters/c6007

Chapter pages in book: (p. 245 - 262)

9 Tariff Seeking and the Efficient Tariff

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9.1 Introduction

A common reaction to increased import competition is tariff lobbying by interest groups adversely affected by the competition, a phenomenon christened "tariff seeking" in Bhagwati and Srinivasan (1980). Empirical analyses by Cheh (1974), Pincus (1975), Caves (1976), and several others have pointed to the importance of interest group pressures in determining the level of tariffs and, in particular, the importance of tariff lobbying within labor-intensive industries.

In this paper we shall model the lobbying activities of labor, used intensively in the import-competing industry, as a game between labor and the government, where the actions of the government are determined jointly by its willingness to grant (or perhaps its inability to resist the granting of) tariffs in the face of political pressure and by its desire to maximize social welfare.

We shall suppose that a decrease in the relative price of imports due to increased foreign competition triggers lobbying activity by labor and that this political pressure leads the government to grant tariff protection. The tariff improves the real wages of labor, but under the assumption that we are dealing with a small country, is welfare-inferior to a position of no

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Financial support for the research underlying this paper was provided by NSF Grant SOC 79-07541.

tariff and no lobbying. It should be expected, then, that the government will search for policies to reduce the lobbying activity and resulting tariff. If lump-sum taxation were feasible, then the government could simply bribe labor to stop its lobbying activity by offering sufficiently high compensation, thereby restoring the economy to its first-best position with no tariff.

However, in the more realistic case where the government faces a budget constraint, its ability to bribe labor is limited, and in this case it may turn to the revenue created by the tariff itself as a source of funds. By using this revenue to increase labor's real income (defined as the sum of its real wages and this subsidy, as in Bhagwati 1959), the government can change the amount of lobbying activity and tariff, and improve welfare. It cannot, however, eliminate the lobbying activity completely since in that case the tariff is zero and there is no revenue with which to compensate labor. So in general the equilibrium after *optimal* government intervention will have a nonzero tariff, and we shall refer to this as the *efficient* tariff.[1]

Note that the efficient tariff is a second-best concept in that lump-sum taxation to raise funds to compensate labor is assumed infeasible. The idea makes a good deal of sense insofar as the revenue raised for redistribution is being generated as a side effect of the protection itself and is *not* being raised *ab initio* for the redistribution.[2] Our underlying assumption that one part of the government responds to the protectionist pressures while another tries to maximize welfare subject to this response suggests, as some conference participants wittily remarked, a "left-brain, right-brain" or an "ego versus id" type of approach to the political economy at hand. It does reflect, however, the classic division and confrontation between the (protrade) executive and the (lobbying-dominated) legislature in countries such as the United States.

In section 9.2 we determine the equilibrium tariff level based on optimal lobbying activity by labor. In section 9.3 we introduce the possibility of government intervention in the form of conditional subsidies to labor and derive the efficient tariff. While one might expect that it is optimal for the government to *reduce* the amount of lobbying and the resulting tariff, it is also possible for the optimal policy to involve an *increase* in the level of lobbying and tariff. This paradox can arise if, given the existing distortion caused by the tariff, the shadow price of the lobbying activity is *negative*, so that an increase in the lobbying activity may be socially desirable (for analyses of negative project shadow prices see Srinivasan and Bhagwati 1978; Bhagwati, Srinivasan, and Wan 1978; Bhagwati and Srinivasan 1980). In section 9.4 we derive a necessary and sufficient condition for this possibility to arise. Further discussion and conclusions are given in sections 9.5 and 9.6.

9.2 Optimal Lobbying

We shall adopt the usual 2 × 2 HOS (Heckscher-Ohlin-Samuelson) model, with industry 1 labor-intensive and import-competing. Choosing commodity 2 as the numeraire, let p^* and $p = p^*(1 + t)$ denote the foreign and domestic relative price of commodity 1, respectively, where t is the *ad valorem* tariff rate and, under the assumption of a small country, p^* is given as a parameter by world trade. The consumption and production of good i are denoted by X_i and Y_i, $i = 1,2$, and the factor prices and given endowments of labor and capital are denoted by w, r, $\bar{L}$, and $\bar{K}$, respectively.

Suppose that the foreign relative price of good 1 falls from p_0^* to p^* due to increased import competition and that this triggers tariff lobbying by labor, whose real wages have fallen. Following Findlay and Wellisz (chapter 8 of this volume), we shall assume that this lobbying activity takes the form of hiring labor L_t and capital K_t to determine a tariff level $t = f(L_t, K_t)$, where f is increasing and concave. This lobbying function should be interpreted as derived from given political behavior and institutions, such as the desire of politicians to maximize their probability of reelection.[3] We shall denote minimum costs at which the tariff rate t can be obtained as $C(t,w,r)$. A reasonable form for the lobbying cost function is

$$C(t,w,r) = \left\{ \frac{t\phi(w,r)}{\max\{0,(p_0^* - p^*(1+t)\}} \right\}, \tag{1}$$

where $\phi(w,r)$ is increasing and quasi-concave. For this cost function, as the tariff increases and $p^*(1 + t)$ approaches p_0^* so that labor's real wages approach the level obtained *before* the increased import competition, costs become arbitrarily large. Also, if import competition were to *decline* ($p^* > p_0^*$) and labor's real wages improve, then the costs of lobbying for any positive tariff would be arbitrarily large. This cost function is meant to embody the notion that *before* the change in the terms of trade the historically determined distribution of income between labor and capital was "acceptable" in the sense that lobbying would have been ineffective (lobbying costs would have been arbitrarily large), and it is only *after* the shift in the terms of trade that lobbying becomes feasible for the factor whose real wages have deteriorated. Adopting an analogous lobbying cost function for capital, and for the case we are considering where $p_0^* > p^*$, capitalists will *not* lobby after the change in the terms of trade because their real rental has improved.[4]

We shall assume that all laborers have an identical linearly homogeneous utility function, and denote the maximum utility obtainable with the relative price p and income I by $V(p,I)$. After the fall in the foreign relative price of commodity 1 from p_0^* to p^*, labor's lobbying problem is

$$\max_{t \geq 0} V\{p^*(1+t), w\bar{L} - C(t,w,r)\}, \tag{2}$$

where $(w\bar{L} - C(t,w,r))$ is labor's income net of lobbying costs. Using Roy's identity,[5] the first-order conditions for this problem can be written as

$$p^*\left(\bar{L}\frac{dw}{dp} - X_1^L\right) = \frac{dC}{dt}, \tag{3a}$$

where

$$\frac{dC}{dt} = \left(w\frac{\partial L_t}{\partial t} + r\frac{\partial K_t}{\partial t}\right) + p^*\left(L_t\frac{dw}{dp} + K_t\frac{dr}{dp}\right). \tag{3b}$$

The left-hand side of (3a) is the change in labor's real income due to a change in the tariff, $dw/dp > 0$ and $(\bar{L}\,(dw/dp) - X_1^L) > 0$, where X_1^L is labor's consumption of good 1;[6] the right-hand side is the marginal cost of the tariff, including both the direct effect on costs of hiring more inputs and the indirect effect of changing factor prices.

The solution t^* to labor's lobbying problem is illustrated in figure 9.1, where $C(t)$ are costs as a function of t including general equilibrium changes in factor prices, and the "benefits" curve $B(t)$ has slope $p^*\,(\bar{L}\,(dw/dp) - X_1^L)$. For the lobbying cost function given in (1), costs approach infinity as t approaches $\tilde{t} = (p_0^*/p^*) - 1$, and this implies that $t^* < \tilde{t}$; so the domestic price ratio $p = p^*(1 + t^*)$ after tariff lobbying lies between the foreign price ratios p_0^* and p^* obtaining before and after the increase in import competition, respectively. Note that multiple solutions to (3) are possible.[7] Assuming that lobbying costs are shared equally by all laborers, the net wage after lobbying is $(w - C(t^*,w,r)/\bar{L})$.

9.3 Government Intervention

The equilibrium with optimal lobbying by labor is welfare-inferior to a position of no lobbying and no tariff. Thus, as argued in section 9.1, the government may turn to the revenues created by the tariff itself as a source of funds to compensate labor and improve welfare. In order to be effective, this compensation will take the form of subsidy payments which are *conditional* on the tariff rate: for the case in which the government wishes to reduce the level of lobbying and tariff to $\hat{t} < t^*$ it would offer the subsidy $\hat{S}(t)$ defined by

$$\hat{S}(t = \begin{cases} S(\hat{t}) & \text{for } t \leq \hat{t} \\ 0 & \text{for } t > \hat{t}, \end{cases} \tag{4}$$

where $S(\hat{t})$ is chosen such that labor will *accept* the conditional subsidy. This bribe is illustrated in figure 9.1, from which it is clear that the minimum level of $S(\hat{t})$ that labor will accept is

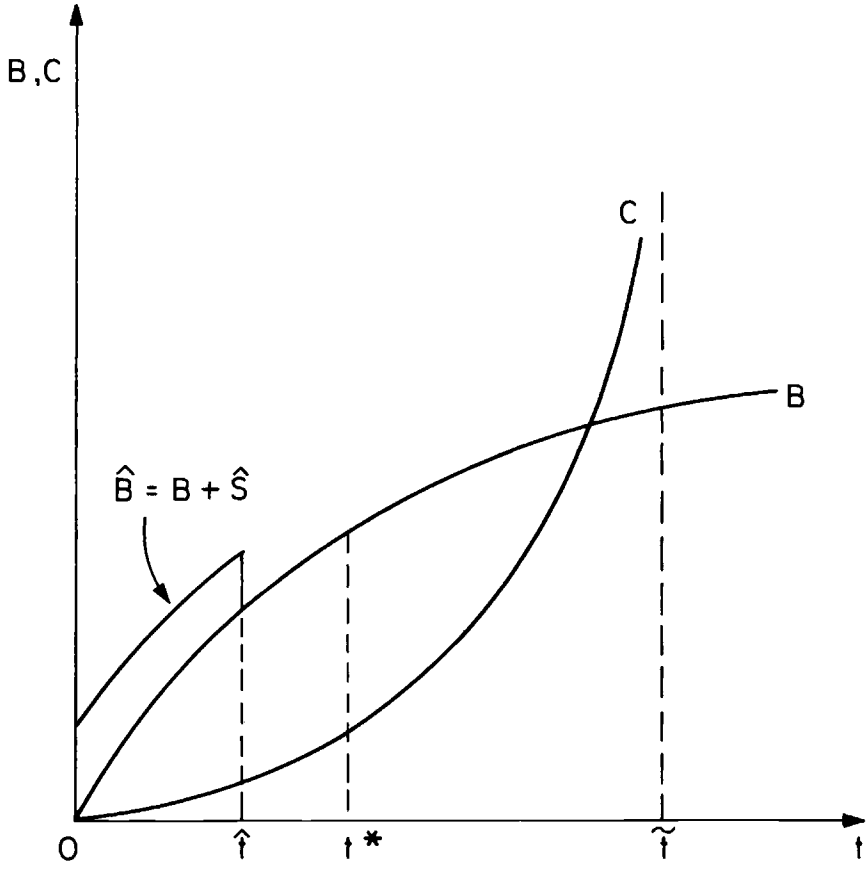

Fig. 9.1

$$S(\hat{t}) = \left[B(t^*) - C(t^*)\right] - \left[B(\hat{t}) - C(\hat{t})\right], \tag{5}$$

in which case labor is indifferent between $\hat{t}$ and t^*. The schedule of minimum subsidy payments $S(t)$ is implicitly defined by (5) or, equivalently,

$$V(p^*(1+t), w\bar{L} - C(t,w,r) + S(t)) = V_L^*, \tag{5'}$$

where V_L^* is the utility of labor in the optimal lobbying equilibrium. The subsidy payments are illustrated in figure 9.2. Note that for the case in which the government wishes to increase the level of lobbying and tariff to $\hat{t} > t^*$, it would offer the conditional subsidy $\hat{S}(t)$ defined by

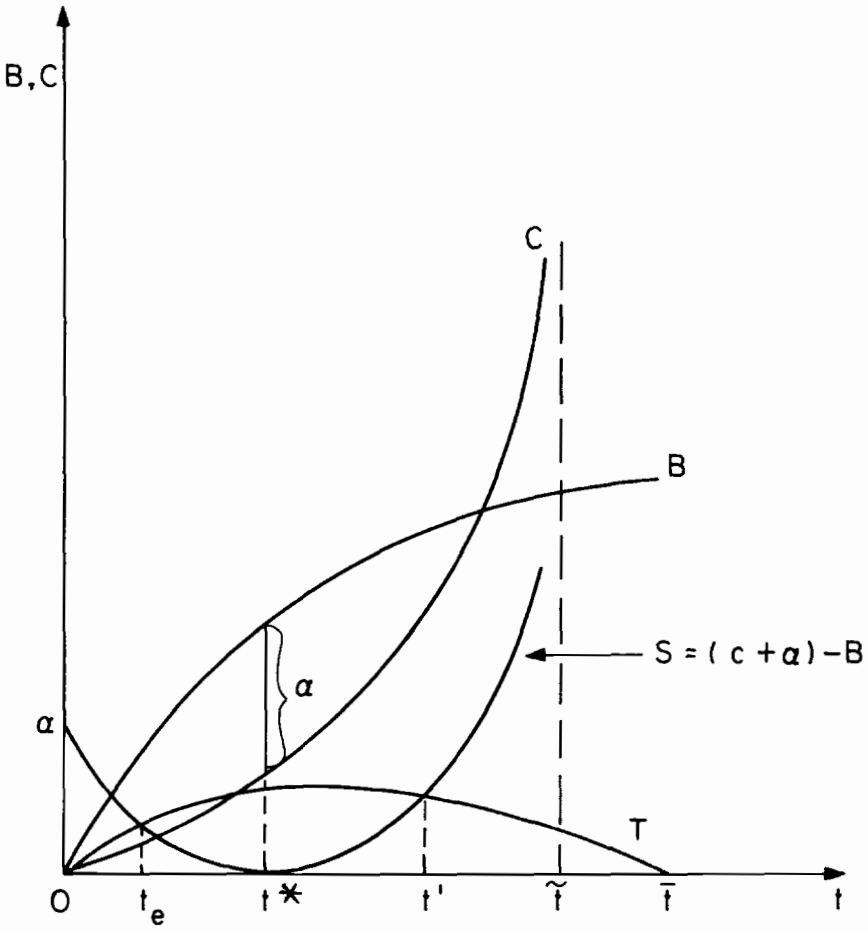

Fig. 9.2

$$\hat{S}(t) = \begin{cases} 0 \text{ for } t < \hat{t}, \\ S(\hat{t}) \text{ for } t \geq \hat{t} \end{cases}$$

where with $S(t)$ chosen according to (5) or (5′) labor would be willing to accept this compensation.

Using the subsidy payments $S(t)$, the government can shift the equilibrium of the economy to any desired position with $0 \leq t < \tilde{t}$, and we assume that it wishes to choose the position which maximizes social welfare.[8] Assuming that the government places equal weight on all individuals when evaluating social welfare and that capitalists have the same linearly homogeneous utility function as laborers, social welfare is given by

$$\begin{aligned} U = & \; V(p^*(1+t), w\bar{L} + r\bar{K} + T - C(t,w,r)) \\ = & \; V(p^*(1+t), w\bar{L} - C(t,w,r,) + S(t)) \\ & + V(p^*(1+t), r\bar{K} + T - S(t)) \\ = & \; V_L^* + V(p^*(1+t), r\bar{K} + T - S(t)), \end{aligned}$$

where T denotes redistributed tariff revenues. Since V_L^* is a constant, maximizing social welfare is equivalent to maximizing $V_k \equiv V(p^*(1+t), r\bar{K} + T - S(t))$, which is the utility of capitalists when they receive their rental income and redistributed tariff revenues less subsidy payments. We explicitly rule out the possibility of lump-sum taxation of capital, and so the net income distributed to capital must be *nonnegative*. Thus, the government's problem can be stated as

$$\max_{t \geq 0} V_K \text{ subject to } T - S(t) \geq 0. \tag{6}$$

The tariff rate t_e given by the solution to (6) is the *efficient* tariff. The game-theoretic equilibrium at which the efficient tariff obtains is a *Stackelberg* equilibrium with the government as the Stackelberg leader: in choosing its optimal policy, labor takes any conditional subsidy offer $\hat{S}(t)$ as given, whereas the government includes the reaction of labor to different subsidy offers in its decision framework.

The efficient tariff may be below or exceed the optimal labor-lobbying tariff t^*, where the latter possibility can arise if the shadow price of the lobbying activity is negative. Consider first the "normal" case, where it is optimal for the government to bribe labor to *reduce* the lobbying activity and resulting tariff. Then the *minimum* feasible tariff rate and maximum social welfare is clearly attained where $T = S(t)$, so that all of the tariff revenue is used to compensate labor and none is distributed to capital. This corner solution is shown as $t_e < t^*$ in figure 9.2, where $\bar{t}$ is the prohibitive tariff, and $\bar{t} > \tilde{t}$ since it is assumed that industry 1 was import-competing before the initial shift in the terms of trade.[9] For the latter case where it is optimal for the government to *increase* the level of lobbying and tariff from t^*, social welfare is maximized at a tariff rate *between* t^* and t'. The point t' is defined by $t' > t^*$ and $T = S(t')$, and the efficient tariff is necessarily less than t'. This result can be demonstrated as follows. Using the subsidy payments $S(t)$, labor obtains the same utility at t^* and t', but since at t' *all* tariff revenues are used to compensate labor and the rental on capital is less than at t^* (by the Stolper-Samuelson theorem), capital is necessarily worse off at t' as compared with t^*. Therefore, social welfare is lower at t' than at t^*, and so for the case we are considering where a marginal rise in the tariff rate from t^* increases social welfare, the maximum is clearly obtained between t^* and t'.[10]

When can the latter paradoxical case arise? As we shall demonstrate in the following section, starting at any tariff rate t, $0 \leq t < \tilde{t}$, an *increase* in

the amount of lobbying activity and resulting tariff due to government intervention is welfare-improving if and only if

$$-\frac{d}{dt}\left(p^*Y_1 + Y_2\right) < t(p^*)^2\left(\frac{\partial X_1}{\partial p}\bigg|_u - \frac{\partial Y_1}{\partial p}\right), \tag{7}$$

whereas the optimal intervention is to decrease the amount of lobbying and tariff if the inequality in (7) is reversed.[11] The left-hand side of (7) is the change in national income evaluated at *international* prices due to a change in the level of lobbying activity and tariff, which is the *shadow price* of the lobbying activity. The right-hand side of (7) reflects the change in tariff revenue due to substitution effects in consumption and production, and is negative since

$$\frac{\partial X_1}{\partial p}\bigg|_u < 0 \text{ and } \frac{\partial Y_1}{\partial p} > 0.$$

Thus, an increase in the lobbying activity and tariff is optimal if and only if the shadow price of the lobbying activity is negative and sufficiently large in absolute value.

9.4 Derivation of Optimal Government Intervention

The change in the subsidy given to labor needed to keep labor's utility at its optimal lobbying level can be calculated from (5′) as

$$\frac{dS}{dt} = -\{p^*(\bar{L}\frac{dw}{dp} - X_1^L) - \frac{dC}{dt}\}. \tag{8}$$

When the tariff revenues less subsidy payments are redistributed to capitalists, their utility is $V_K = V(p^*(1+t), r\bar{K} + T - S(t))$, and

$$\frac{dV_k}{dt} = \frac{\partial V}{\partial I}\{p^*(\bar{K}\frac{dr}{dp} - X_1^K) + \frac{dT}{dt} - \frac{dS}{dt}\},$$

where X_1^K is the consumption of good 1 by capitalists and $dr/dp < 0$. Then $dV_K/dt > 0$, in which case it is optimal for the government to bribe labor to *increase* the amount of lobbying and resulting tariff, if and only if

$$\left(\frac{dT}{dt} - \frac{dS}{dt}\right) > -p^*\left(\bar{K}\frac{dr}{dp} - X_1^K\right). \tag{9}$$

The right-hand side of (9) is the real income loss of capitalists due to a higher tariff, and so the higher tariff is preferred if and only if the net gain in tariff revenue exceeds this loss.

Equation (9) clarifies the nature of the optimal intervention for the case where it is optimal for the government to increase the level of lobbying and tariff from t^* (i.e., [9] holds at t^*). The right-hand side of (9)

is positive (by the Stolper-Samuelson theorem), and in a neighborhood of t' it can be seen that $dT/dt < dS/dt$, so that (9) cannot hold. The efficient tariff in this case is obtained when (9) holds with equality, which will occur at a point between t^* and t'. We can also see that the efficient tariff satisfies $dT/dt > 0$, which implies that the efficient tariff is necessarily less than the *maximum revenue* tariff for which $dT/dt = 0$.

Tariff revenues are given by

$$T = tp^*(X_1(p^*(1+t), w\bar{L} + r\bar{K} + T - C) - Y_1),$$

where $X_1 = X_1^L + X_1^K$, from which we can calculate that

$$\begin{aligned}\frac{dT}{dt} &= \beta\{p^*(X_1 - Y_1) + t(p^*)^2\left(\frac{\partial X_1}{\partial p}\bigg|_u - \frac{\partial Y_1}{\partial p}\right)\} \\ &\quad + \beta t p^*\left(\frac{\partial Y_1}{\partial \bar{L}}\frac{dL_t}{dt} + \frac{\partial Y_1}{\partial \bar{K}}\frac{dK_t}{dt}\right) \\ &\quad + (\beta - 1)\left(p^*\bar{L}\frac{dw}{dp} + p^*\bar{K}\frac{dr}{dp} - p^*X_1 - \frac{dC}{dt}\right), \qquad (10)\end{aligned}$$

where $\beta = (1 - tp^*(\partial X_1/\partial I)^{-1} > 0$ so long as good 2 is not inferior.[12] We also have

$$\begin{aligned}&\frac{dS}{dt} - p^*\left(\bar{K}\frac{dr}{dp} - X_1^K\right) \\ &\quad = -\left(p^*\bar{L}\frac{dw}{dp} + p^*\bar{K}\frac{dr}{dp} - p^*X_1 - \frac{dC}{dt}\right)\end{aligned}$$

using (8);

$$\begin{aligned}&= -\left(p^*(\bar{L} - L_t)\frac{\partial Y_1}{\partial \bar{L}}\right. \\ &\quad \left. + p^*(\bar{K} - K_t)\frac{\partial Y_1}{\partial \bar{K}} - p^*X_1 - C_t\right)\end{aligned}$$

using (3b), using the reciprocity relations $dw/dp = \partial Y_1/\partial \bar{L}$ and $dr/dp = \partial Y_1/\partial \bar{K}$, and since $C_t = w(\partial L_t/\partial t) + r(\partial K_t/\partial t)$;

$$= p^*(X_1 - Y_1) + C_t \qquad (11)$$

since $$Y_1 = (\bar{L} - L_t)\frac{\partial Y_1}{\partial \bar{L}} + (\bar{K} - K_t)\frac{\partial Y_1}{\partial \bar{K}}.$$

Using (10) and (11), condition (9) becomes

$$(9') \qquad t(p^*)^2\left(\frac{\partial X_1}{\partial p}\bigg|_u - \frac{\partial Y_1}{\partial p}\right) + tp^*\left(\frac{\partial Y_1}{\partial \bar{L}}\frac{dL_t}{dt} + \frac{\partial Y_1}{\partial \bar{K}}\frac{dK_t}{dt}\right) - C_t > 0.$$

To further simplify (9') we must introduce the concept of *shadow prices* of primary factors at the tariff-distorted equilibrium. Letting a_{ij} denote the cost-minimizing unit-output requirement of factor i in industry j, evaluated at the tariff-distorted domestic price ratio $p = p^*(1 + t)$, the factor prices w and r satisfy

$$p^*(1 + t) = a_{L1}w + a_{K1}r,$$

$$(12a) \qquad 1 = a_{L2}w + a_{K2}r,$$

whereas the *shadow* factor prices w^* and r^* are defined by

$$p^* = a_{L1}w^* + a_{K1}r^*,$$

$$(12b) \qquad 1 = a_{L2}w^* + a_{K2}r^*.$$

Using (12a) and (12b), it can be shown that

$$tp^*\frac{dw}{dp} = w - w^*,$$

$$(13) \qquad tp^*\frac{dr}{dp} = r - r^*.$$

Using (13) and the reciprocity relations, we then have

$$tp^*\left(\frac{\partial Y_1}{\partial \bar{L}}\frac{dL_t}{dt} + \frac{\partial Y_1}{\partial \bar{K}}\frac{dK_t}{dt}\right)$$

$$(14) \qquad = C_t - \left(w^*\frac{\partial L_t}{\partial t} + r^*\frac{\partial K_t}{\partial t}\right) + \theta,$$

where

$$\theta = t(p^*)^2\left\{\frac{\partial L_t}{\partial w}\left(\frac{dw}{dp}\right)^2 + 2\frac{\partial L_t}{\partial r}\left(\frac{dw}{dp}\right)\left(\frac{dr}{dp}\right) + \frac{\partial K_t}{\partial r}\left(\frac{dr}{dp}\right)^2\right\}$$

$$= t^{-1}(w^*, r^*)\begin{bmatrix} C_{ww} & C_{wr} \\ C_{rw} & C_{rr} \end{bmatrix}\begin{pmatrix} w^* \\ r^* \end{pmatrix} \leq 0,$$

since $C(t,w,r)$ is concave in (w,r).

Substituting (14) into (9′), the necessary and sufficient condition for an increase in the level of lobbying and tariff to be welfare-improving is

$$(9'') \qquad (w^* \frac{\partial L_t}{\partial t} + r^* \frac{\partial K_t}{\partial t}) - \theta < t(p^*)^2 (\frac{\partial X_1}{\partial p}\Big|_u - \frac{\partial Y_1}{\partial p}).$$

Finally, note that national income evaluated at international prices is given by

$$p^* Y_1 + Y_2 = w^*(\bar{L} - L_t) + r^*(\bar{K} - K_t),$$

from which it can be shown that

$$(15) \qquad -\frac{d}{dt}(p^* Y_1 + Y_2) = (w^* \frac{\partial L_t}{\partial t} + r^* \frac{\partial K_t}{\partial t}) - \theta.$$

Substituting (15) into (9′′), we obtain condition (7), as desired.

9.5 A Sufficient Condition for Welfare Improvement in the Lobbying Equilibrium

In the absence of any tariff lobbying the fall in the relative price of imports due to foreign competition, while harmful to the real wages of labor, is welfare-improving. The lobbying activity reduces welfare from that point by establishing a tariff and using resources, and so it is possible for social welfare to be *lower* after the improvement in the terms of trade and resulting lobbying and tariff than before. However, as shown in figure 9.3, a *sufficient* condition for welfare to be *higher* after the improvement in the terms of trade and lobbying is easily derived. (Note that the efficient tariff equilibrium is no worse than the lobbying equilibrium, so that our sufficiency condition extends to it as well.)

In figure 9.3 the equilibrium production points before and after the fall in the relative price of imports (and with no lobbying) are P_0 and P_1, respectively, and $0I$ is the income-consumption path corresponding to the domestic price ratio in the tariff-distorted equilibrium. For the lobbying cost function given in (1), the domestic price ratio with optimal labor lobbying lies between the international price ratios obtaining before and after the change in the terms of trade (so that $\tilde{P}$ is spanned by P_0 and P_1). Production is shifted from $\tilde{P}$ to P_t by the lobbying activity, and consumption is at C_t. For the given tariff, an increase in lobbying costs would shift consumption down along $0I$, but so long as the consumption point does not fall below $\tilde{C}$, welfare U_t must be higher than U_0. (Note that this condition is sufficient but *not* necessary and that $\tilde{C}$ is a hypothetical

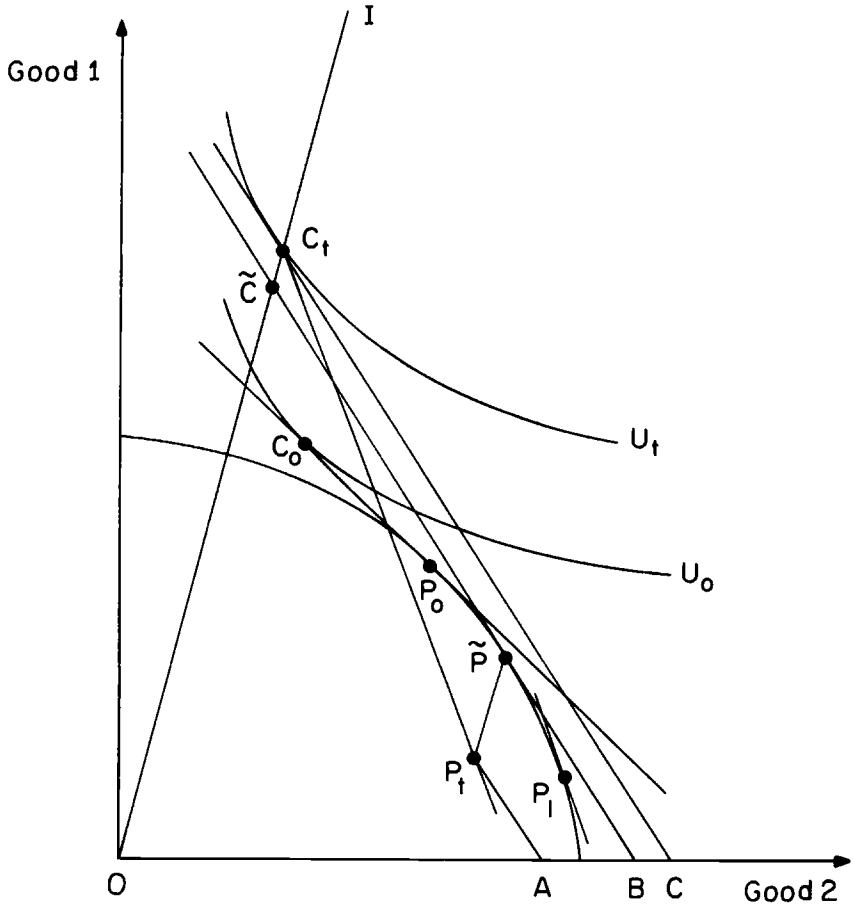

Fig. 9.3

consumption point which does *not* correspond to any trade equilibrium.) The condition for C_t to exceed $\tilde{C}$ is that tariff revenues AC exceed lobbying costs AB, and so this is a sufficient condition for welfare to *improve* due to the initial fall in the relative price of imports.

9.6 Conclusions

We have derived the efficient tariff obtaining in the Stackelberg equilibrium of a game between the government and labor, where labor lobbies for a tariff and the government responds by granting some tariff protection but also by using tariff revenues to compensate labor directly, thereby changing the amount of lobbying. For the lobbying cost function given in (1), the real rental on capital improves as a result of the improve-

ment in the terms of trade despite the lobbying (i.e., in moving from P_0 to P_t in figure 9.3), labor's real income is damaged by the increased foreign competition but is higher than in the absence of lobbying, and so long as tariff revenues exceed lobbying costs in the final equilibrium the improved terms of trade improve social welfare.

Notes

1. Johnson's (1960) concept of the "scientific tariff" related to that tariff structure which would minimize the cost of certain "noneconomic" objectives such as "diversification, industrialization, or agriculturization" and "national self-sufficiency and independence." As such, it was a constrained, second-best concept, the second-best nature of the tariff structure relating to the fact that the first-best solution is additionally being constrained by the noneconomic objectives. As noted in the text, however, our concept of the "efficient tariff" is also a second-best one insofar as the lobbying activity cannot be eliminated by bribing labor with lump-sum transfers in a first-best solution. The efficient tariff, however, minimizes the welfare loss from the successful lobbying for a tariff by utilizing an added policy instrument which is perfectly appropriate to the problem (and which was earlier disregarded by trade theorists following the Meade assumption that all tariff revenues are given away as lump-sum transfers), namely, the tariff revenues which can be used to bribe labor into accepting a lower tariff.

2. Gene Grossman has pointed out to us that something very similar in spirit to the efficient tariff notion is implied by the Carter administration's proposal to use the revenue raised from the oil tariff and the windfall profits tax to compensate the losers from higher-priced oil. In chapter 12 Richardson also notes that a provision of the Trade Act of 1974 earmarked funds out of tariff revenues for the retraining of trade-displaced workers.

3. Brock and Magee (1978) model politicians as maximizing their probability of reelection in a very general game-theoretic framework.

4. Aside from the direct costs of hiring factors to lobby, the lobbying cost function can also be interpreted as including costs of labor *union* activity which induces tariff lobbying by *entrepreneurs*. For example, if workers strike in response to lowered real wages, this could lead to greater tariff lobbying by entrepreneurs in an attempt to meet union wage demands without reducing the return on capital. Labor would have to bear the costs of not receiving wage income during the strike (though these costs may be mitigated by government compensation), as well as some portion of the opportunity costs of capital unemployed during the strike. Within the context of our model we are assuming that the costs to labor $C(t,w,r)$ include the *full* opportunity cost of unemployed capital as well as the lobbying costs of entrepreneurs in industry 1; we also do not consider the role of government unemployment compensation.

5. Roy's identity states that $X_1 = (-\partial V/\partial p)/(\partial V/\partial I)$.

6. We have $(\bar{L}\,(dw/dp) - X_1^L) > 0$ since, by the Stolper-Samuelson theorem, labor's real wages improve in terms of *either* good and so the rise in real income exceeds the increased cost of consumption.

7. Of course, if $C(t)$ is convex and $B(t)$ concave, then the solution is unique. The convexity of $w(p)$, which is a component of $B(t)$, is investigated in Kemp and Khang (1975).

8. Note that the government's desire to maximize social welfare is consistent with its willingness to grant tariff protection, in that the latter can represent its reaction to distributive equity whereas the former corresponds to allocative efficiency.

9. Note that the tariff revenue T need *not* be "single-peaked" as shown in figure 9.2. If $T = S(t)$ at numerous values of t, then the optimal value of t when the government wishes to reduce the lobbying activity and resulting tariff is the *minimum* t for which $T = S(t)$.

10. If $T = S(t')$ and $t' > t^*$ at numerous values of t', then the efficient tariff when the government wishes to increase the level of lobbying and tariff from t^* must lie between t^* and the *maximum* value of t'.

11. An interior maximum of social welfare is obtained when (7) is satisfied with equality (and the second-order conditions for maximization are satisfied).

12. Since marginal propensities to consume must add up to unity, we have $(1 - tp^* (\partial X_1/\partial 1)) = (p^* (\partial X_1/\partial I) + (\partial X_2/\partial I))$, and this expression is positive so long as good 2 is not inferior.

References

Bhagwati, J. N., 1959, Protection, real wages, and real incomes. *Economic Journal* 69: 733–44.

Bhagwati, J., and T. N. Srinivasan. 1979. On inferring resource allocational implications from DRC calculations in trade-distorted, small open economics. *Indian Economic Review* 14, no. 1 (April): 1–16.

———. 1980. Revenue-seeking: A generalization of the theory of tariffs. *Journal of Political Economy* 88, no. 6 (December): 1069–87.

Bhagwati, J., T. N. Srinivasan, and H. Wan, Jr. 1978. Value subtracted, negative shadow prices of factors in project evaluation and immiserizing growth: Three paradoxes in the presence of trade distortions. *Economic Journal* 88 (March): 121–25.

Brock, W. A., and S. P. Magee. 1978. The economics of special interest politics: The case of the tariff. *American Economic Review Papers and Proceedings* 68, no. 2 (May): 246–50.

Caves, R. E. 1976. Economic models of political choice: Canada's tariff structure. *Canadian Journal of Economics* 9, no. 2 (May): 278–300.

Cheh, J. 1974. United States concessions in the Kennedy Round and short-run labour adjustment costs. *Journal of International Economics* 4, no. 4 (November): 323–40.

Johnson, H. C. 1960. The cost of protection and the scientific tariff. *Journal of Political Economy* 68, no. 4 (August): 327–45.

Kemp, M. C., and C. Khang, C. 1975. A convexity property of the two-by-two model of production. *Journal of International Economics* 5: 255–61.

Pincus, J. J. 1975. Pressure groups and the pattern of tariffs. *Journal of Political Economy* 83, no. 4 (August): 757–78.

Srinivasan, T. N., and J. Bhagwati. 1978. Shadow prices for project evaluation in the presence of distortions: Effective rates of protection and domestic resource costs. *Journal of Political Economy* 86, no. 1: 96–116.

Comment

Robert E. Baldwin

The Feenstra-Bhagwati paper is an ingenious application of policymaking under second-best conditions. How, the authors ask, would the usual tariff-seeking analysis, whereby pressure groups continue to incur additional (and increasing) lobbying costs in order to increase a protective tariff until they equal the additional (and decreasing) real income benefits associated with these expenditures, be changed if the government in an effort to improve national welfare utilized the tariff proceeds to bribe the interest group into accepting a different tariff rate? Using a model in which the Stolper-Samuelson theorem holds and in which labor engages in lobbying in response to an initial decline in the international price of the labor-intensive import good, they show that the optimal compensation payment to labor by the government could result in this "efficient" tariff being either lower or higher than the optimum rent-seeking duty for labor in the absence of this form of government intervention.

While the use of tariff revenues to gain the acceptance of tariff changes is not common, the National Wool Act of 1954 is an example of such a policy. In the early 1950s producers of manufactured woolen products pressed for a reduction in the duty on raw wool in order to reduce the cost of one of their major inputs. The duty was reduced, but as compensation to United States wool producers the act permits them to receive up to 70 percent of the accumulated duties on wool and manufactured woolen products.

Let me make a few comments about some of the assumptions in the Feenstra-Bhagwati analysis. One concerns the supposition that capitalists, who lose as the tariff is increased, do not themselves engage in lobbying because the optimum rent-seeking duty and the "efficient" tariff are assumed to yield a lower domestic price for the import-competing good than the level prior to the initial international decline in the price of this good. While these price relationships seem reasonable, it may not be the case that capitalists fail to resist a decline in their real income simply because this income still remains above some initial level. It does not take long for income groups to develop a vested interest in maintaining economic benefits they have received. However, if the problem is posed as one where labor is resisting the full tariff cut agreed upon as part of a multilateral trade negotiation, it does make sense to suppose that the lobbying activity of the capitalists will be less than that of the workers.

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A more significant assumption on the part of Feenstra and Bhagwati is that, subject to the ability of labor to secure the real income level associated with its optimal lobbying tariff, the government seeks to maximize social welfare. Since labor's real income is being held constant by utilizing the tariff proceeds as a labor subsidy, this means—as the authors note—that the government maximizes the welfare of the capitalists, even though they do not press for help by lobbying. The assumption that the government behaves in this manner seems somewhat inconsistent with a model that emphasizes the role of lobbying in determining policy. In such models the government is usually assumed to respond only to political pressues from common-interest groups and not to have a general welfare function of its own. When the government is assigned an independent role, it generally is the one of promoting the real income interests of those employed in the government. Thus the authors might justify in more detail why they believe that it is reasonable to assume that the government will promote the welfare interests of the capitalists. Furthermore under these assumed conditions they should also consider, as a possibly superior welfare-increasing policy to compensation, the use of the tariff proceeds by the government for informational purposes designed to counter the lobbying of labor.

If one assumes that only labor engages in lobbying and also drops the assumption that the government aims to maximize welfare subject to this lobbying, then it seems reasonable to suppose that labor will seek to improve its position not only by raising its wages but by obtaining the tariff proceeds directly as a subsidy. In this case the tariff revenue curve in figure 9.2 would be added to the benefits curve in that figure. The cost curve might also be increased if additional lobbying was required to obtain this subsidy. In any event, the optimal tariff under these assumptions could be either higher or lower than the equilibrium level when it is assumed these proceeds cannot be obtained directly by labor. Of course, one might go further and ask why labor does not seek as a subsidy some of the capitalists' extra income. One reason why most political models of this type specify lobbying benefits and cost functions for all income participants and all policy actions is to yield unique solutions for any type of lobbying activity and thus block this type of speculation.

A relevant international application of the Feenstra-Bhagwati model is to analyze the use of the windfall gains from quotas to bribe foreign producers into accepting export restraints. If a Cairnes-type model is utilized in which the incomes of all groups employed in a national industry move in the same direction in the short run, one can think of a domestic industry as lobbying for protection while the foreign industry counters with its own lobbying because of the adverse terms-of-trade consequences of tariff increases. The equilibrium tariff is the one where these opposing faces are balanced in the usual way with the tariff pro-

ceeds going to the domestic government for general revenue purposes. Suppose, however, that the domestic industry proposes a quota system whereby the windfall gains (the equivalent of the government's revenue under a tariff system) go to the foreign producers. This is what in fact happens under most voluntary export-constraint arrangements. Following the Feenstra-Bhagwati line of thought, foreign producers can be bribed by these windfall gains into accepting more stringent restrictions on their exports than they otherwise would have obtained. Both the domestic and foreign industry can, in other words, be made better off than under the adversarial tariff-seeking solution. However, consumers in the country imposing the restriction lose both because the domestic price rises and because tax revenues fall. It would be interesting to see the implications of this problem fully explored in terms of the Feenstra-Bhagwati model.

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