Chapter 26
Appendix to Chapter 12

26.1 Lobbies, Political Parties, and Endogenous Determination of Protection

We examine here a model by Brock, Magee, and Young (1989, Appendix to chap. 3), which considers two lobbies and two parties. Lobby 1 is pro-export (i.e., it favours an export subsidy that is to say a negative tariff). Lobby 2 is protectionist, namely in favour of a tariff on imports. Party 1 is pro-export, while party 2 is protectionist. The bulk of the voters are in favour of free trade but are imperfectly informed and behave in a nonstrategic manner.

The parties maximise their probabilities of election and the lobbies maximise the expected incomes of their membership. The income of the protectionist lobby 2 will obviously be higher under the protectionist party 2 than under the pro-export party 1, and vice versa for lobby 1. In what follows we use the same notation as Brock et al. (1989), where the primed values of a variable denote the pro-export lobby 1.

pro-export lobby 1

$$\max_{C^{1'},C^{2'}} R^{'} = (1-p)r^{1'} + pr^{2'} - C^{1'} - C^{2'}. \tag{26.1}$$

In this equation, p is the probability of election of party 2 and $(1-p)$ the probability of election of party 1. When the pro-export party 1 is elected the revenue of the pro-export lobby 1 is $r^{1'}$, greater than $r^{2'}$, the revenue of lobby 1 when the protectionist party 2 is elected. If we multiply these incomes by the relevant probabilities we obtain the total *expected* revenue of lobby 1. The expected income is obtained deducting the lobby's costs, that for simplicity's sake are assumed to consist only of the campaign contributions to the two parties, $C^{1'}$ and $C^{2'}$. The strategy of the lobby is to maximise expected income by an appropriate choice of the contributions.

G. Gandolfo, *International Trade Theory and Policy*, Springer Texts in Business and Economics, DOI 10.1007/978-3-642-37314-5_26,

In a similar way we obtain the expected income of lobby 2:

protectionist lobby 2

$$\max_{C^1, C^2} R = (1-p)r^1 + pr^2 - C^1 - C^2, \tag{26.2}$$

where $r^2 > r^1$, since the income of the protectionist lobby is higher when the protectionist party is elected.

Let us now come to the parties, whose strategy is to maximise their probability of election. This depends on the contributions received and on the level of tariffs and export subsidies. Letting $q = 1 - p$ we have

pro-export party 1

$$\max_s q = q[\underbrace{(C^{1'} + C^1)}_{+}, \underbrace{(C^{2'} + C^2)}_{-}, \underset{-}{s}, \underset{+}{t}], \tag{26.3}$$

protectionist party 2

$$\max_t p = p[\underbrace{(C^{1'} + C^1)}_{-}, \underbrace{(C^{2'} + C^2)}_{+}, \underset{+}{s}, \underset{-}{t}], \tag{26.4}$$

where $s \geq 0$ is the export subsidy (favoured by party 1) and $t \geq 0$ is the tariff (favoured by party 2). The signs under the variables represent the signs of the partial derivatives of q and p with respect to the variables. Obviously, an increase in the contributions received by a party causes an increase in the party's probability of election (since a dollar is a dollar, it is irrelevant which lobby the contribution comes from), and a decrease in the other party's probability. Given the general attitude of the voters in favour of free trade, an increase in the tariff has an unfavourable effect on the probability of election of the protariff party 2 and hence a favourable effect on the other party's probability. Similarly, an increase in the export subsidy (which is also an impediment to free trade) has an unfavourable effect on the probability of election of the prosusbsidy party 1 and hence a favourable effect on the other party's probability. Also note that the contributions to the parties from the lobbies are themselves functions of s and t.

It is a common-sense observation that it would be irrational for a lobby to contribute to the party which is favourable to the other lobby. This can easily be proved by observing that the derivative of a lobby's income with respect to the contribution given to the party which is favourable to the other lobby is always negative. Consider for example $\mathrm{d}R'/\mathrm{d}C^{2'} = \mathrm{d}p/\mathrm{d}C^{2'}(r^{2'} - r^{1'}) - 1$. Since $\mathrm{d}p/\mathrm{d}C^{2'} > 0$, and $r^{2'} < r^{1'}$, it follows that $\mathrm{d}R'/\mathrm{d}C^{2'} < 0$. Similarly it can be shown that $\mathrm{d}R/\mathrm{d}C^1 < 0$. Thus we know that $C^{2'} = C^1 = 0$.

Given this result, that Brock and Magee call the "campaign-contribution specialization theorem", the model can be simplified by eliminating $C^{2'}$ and C^1.

The first-order conditions for a maximum yield the following four equations (that form the basis of the Brock and Magee analysis):

$$\begin{aligned} dR'/dC^{1'} &= dp/dC^{1'}(r^{2'} - r^{1'}) - 1 = 0, \\ dR/dC^2 &= dp/dC^2(r^2 - r^1) - 1 = 0, \\ dq/dC^{1'}(dC^{1'}/ds) + dq/ds &= 0, \\ dp/dC^2(dC^2/dt) + dp/dt &= 0, \end{aligned} \tag{26.5}$$

for the determination of the equilibrium values of $C^{1'}, C^2, s, t$.

Thus the tariff and the export subsidy are endogenously determined together with the lobbies' contributions to the parties. By substituting back into the model we can then determine the two lobbies' expected incomes as well as the two parties' probabilities of election. Numerous alternative mathematical models are contained in Brock et al. (1989).

26.2 Dumping

Let us consider *persistent dumping*, based on the theory of the discriminating monopolist. Let q_j be the quantity sold on the j–th market and $R_j = p_j q_j$ the corresponding revenue, where p_j is linked to q_j through the j–th market's demand curve. As we assume that all production is carried out in a single plant, total cost $C(q)$ is a function of the overall quantity produced to serve all markets, $q = \sum_{j=1}^{m} q_j$. We must now maximize the profit function

$$\pi = \sum_{j=1}^{m} R_j \left(q_j\right) - C\left(\sum_{j=1}^{m} q_j\right). \tag{26.6}$$

If we assume that there are only two markets, the domestic and the foreign, we get the first-order conditions

$$\begin{aligned} R_1'(q_1) &= C'(q_1 + q_2), \\ R_2'(q_2) &= C'(q_1 + q_2), \end{aligned} \tag{26.7}$$

whence

$$R_1'(q_1) = R_2'(q_2) = C'(q_1 + q_2), \tag{26.8}$$

that is, the marginal revenue in each market must equal the marginal cost of the output as a whole.

The second-order conditions require the leading principal minors of the Hessian

$$\begin{bmatrix} R_1'' - C'' & -C'' \\ -C'' & R_2'' - C'' \end{bmatrix}$$

to alternate in sign, beginning with minus. In the normal case, $R_j'' < 0$ and $C'' > 0$, and so these conditions are satisfied.

The layman's concept of dumping, i.e. a sale below cost in foreign markets (such as sporadic dumping), is formally modelled for example by Davies and McGuinness (1982) and Bernhardt (1984). For the case in which each firm dumps into other firms' home markets due to oligopolistic rivalry, see Brander and Krugman (1983).

References

Bernhardt, D. (1984). Dumping costs and uncertainty.
Brander, J. A., & Krugman, P. R. (1983). A "reciprocal dumping" model of international trade.
Brock, W. A., Magee, S. P., & Young, L. (1989). *Black hole tariffs and endogenous policy theory: Political economy in general equilibrium.*
Davies, S. W., & McGuinness, A. J. (1982). Dumping at less than marginal cost.