



ELSEVIER

Journal of International Economics 65 (2005) 461–487

Journal of
INTERNATIONAL
ECONOMICS

www.elsevier.com/locate/econbase

Reciprocated unilateralism in trade policy

Pravin Krishna^{a,b,*}, Devashish Mitra^{b,c,1}

^a *Brown University, USA*

^b *NBER, USA*

^c *Syracuse University, USA*

Received 5 November 2001; received in revised form 20 March 2003; accepted 24 October 2003

Abstract

Using the menu-auction approach to endogenous determination of tariffs and allowing additionally for lobby formation itself to be endogenous, this paper analyzes the impact of unilateral trade liberalization by one country on its partner's trade policies. We find that such unilateral liberalization may induce reciprocal tariff reductions by the partner country. Intuitively, unilateral liberalization by one country has the effect of increasing the incentives for the export lobby in the partner country to form and to lobby effectively against the import-competing lobby there for lower protection.

© 2004 Elsevier B.V. All rights reserved.

Keywords: Trade policy; Political economy; Lobby formation; Unilateralism; Reciprocity; GATT

JEL classification: F13; F10; F02

1. Introduction

In trade policy debates, the issue of unilateralism (i.e., the unilateral adoption of liberal trade policies) versus reciprocity (where reciprocity of access is insisted on instead) is a long standing one.² The theoretical arguments used by proponents of either policy stance

* Corresponding author. Current address: Economics Department, Brown University, 64 Waterman Street, Providence, RI 02912, USA. Tel.: +1-401-863-2170; fax: +1-401-863-1970.

E-mail addresses: Pravin_Krishna@Brown.edu (P. Krishna), dmitra@maxwell.syr.edu (D. Mitra).

¹ Contact address: Department of Economics, Maxwell School of Citizenship and Public Affairs, Syracuse University, 133 Eggers Hall, Syracuse, NY 13244, USA.

² Thus, one may consider the recent policy debates in the United States or go back a hundred and fifty years and examine the policy discussions preceding England's famous unilateral repeal of its Corn Laws to find free traders and reciprotarians actively pitted against each other. See [Bhagwati and Irwin \(1987\)](#).

are well known: Unilateralists rely upon the demonstration that in the absence of “distortions,” free trade is efficient, while a policy stance of reciprocity is theoretically supported by the presence of “terms-of-trade” and political economy motivations in the economy.³

In contrast to much of this literature, which has considered these two approaches to trade liberalization independently of each other, it is the goal of this paper to study the possible *causal interaction* between unilateral and reciprocal trade liberalization. Specifically, we are interested in examining the question of whether unilateral trade liberalization by one country could *induce* reciprocal liberalization by its partner in the absence of any communication or negotiation between these two countries. The theoretical platform that we use to investigate this point is the popular construct of Grossman and Helpman (1994), where tariffs are determined by the interaction between competing domestic lobbying groups and the government, and where the government’s objective function itself includes political contributions from organized lobbies and also aggregate welfare. An important feature of our analysis is that formation of organized lobbies itself is treated as being endogenous, as in Mitra (1999). In this context, it is this paper’s central finding that unilateral tariff liberalization by one country, by altering the political economy equilibrium in the partner country, may indeed result in reciprocal tariff reduction by the partner. We believe that this result carries interesting normative implications: It stands in contrast to the conventional policy wisdom on this matter regarding the use of (the threat of) one’s trade barriers to remove those of others—as exemplified by the United States’ recent use of the “Super-301” provision to “retaliate” by raising trade barriers against countries whose trade barriers are perceived as unreasonable.

The linkage between unilateralism and reciprocal liberalization that we have in mind is as follows: Consider a small open economy trading with a large partner. Further, to fix ideas, consider an initial situation in which the import-competing sector in the small country is represented by an organized lobby but the exportables sector is not (due to a fixed cost requirement faced by this sector which in this initial equilibrium exceeds the benefits it could get from the formation of the lobby). Consequently, its (Grossman–Helpman) trade policy vector (determined by lobbying by the import-competing lobby and the government preferences) is characterized by import tariffs (which raise the lobby’s profits) and export taxes (which lower the lobby’s cost of consuming the exportable good).⁴ In this context, unilateral liberalization by the large partner country can be shown to generally increase the incentives for the formation of an export lobby in the small country. This happens for two reasons: First, a higher world price of the exportable good

³ Thus, for instance, Mayer (1981) showed that in the presence of terms of trade motivations for tariffs, international negotiations could lead to a better outcome than the non-cooperative Nash outcome derived earlier by Johnson (1953). Equally, political economy influences have been considered in models explaining agreed-upon reciprocal trade liberalization in the work of Mayer (1984), Grossman and Helpman (1995), Hillman and Moser (1996) and Bagwell and Staiger (1999), among others.

⁴ The export tax derived in the Grossman–Helpman model should not be taken literally. As is well known, in multi-sector general equilibrium models with perfect competition, the imposition of import taxes on all imports is itself equivalent to export taxes being imposed on all exports at the same ad valorem rate (Lerner symmetry). Further, if intermediates are used in production (specifically if the importable is used in the production of the exportable good), it should be clear to see that the import tax itself acts as a tax on the exportable sector.

(resulting from this liberalization) makes the existing trade policy vector more costly for the export lobby. Secondly, at higher export prices (in the absence of an export lobby), the import-competing lobby has incentives to lobby for a trade policy vector even more biased against the exporting lobby—further raising the incentives for formation of the export lobby. Once formed, this export lobby then competes effectively with the import-competing lobby to oppose the orientation of existing trade policies (i.e., to reduce domestic tariffs and export taxes). Unilateral liberalization by one country therefore has a “strategic” effect on the relevant groups in the partner country so that free trade is the outcome.⁵

Several additional points relating to the empirical validity of our results and their connection with the rest of the theoretical literature may be made here: First, we should note that the type of result demonstrated in the paper is indeed possible in the classic [Johnson \(1953\)](#) analysis of optimal tariffs if the tariff reaction functions there are upward sloping. There too, a unilateral tariff reduction by one country would result in tariff reductions by the partner (again, if the partner’s tariff reaction function is upward sloping). However, it should be clear that our analysis differs in significant theoretical (and finally empirically relevant) ways from the Johnsonian analysis. In our framework, a unilateral liberalization by a country would affect even a “small” country’s trade policies, whereas in the Johnsonian analysis, a small open economy keeps its tariffs fixed at zero—independently of the tariffs imposed by the large partner country. Furthermore, in Johnson’s analysis, upward sloping reaction functions can only be derived if partner export supply elasticities are falling in partner country tariffs. Our results do not depend upon this monotonic elasticity relationship whose empirical validity itself may be questioned (indeed most textbook treatments consider the opposite case—that of downward sloping reaction functions).

Second, *without* making a strong empirical claim, we should note that the prediction of our model is consistent with a few major episodes of unilateral trade liberalization which are well known in the history of international economic relations.⁶ As [Coates and Ludema \(1997\)](#) argue, these include the unilateral repeal of England’s Corn Laws in the mid-19th century, “after decades of attempts to negotiate lower tariffs with its trading partners” and the more recent example of the United States, which, after the end of the Second World War sponsored the General Agreement on Trade and Tariffs (GATT) and engaged subsequently in major tariff reductions “without requiring substantive reciprocity from its major trading partners.” “Waves of liberalization” by trading partners followed both these episodes. In the period immediately after England’s repeal of its Corn Laws, numerous countries followed suit—with unilateral trade reforms of their own or with bilateral tariff agreements with England. Equally, the major trading partners of the United States reduced their trade barriers in the period leading up to the 1970s (see [Kindleberger](#),

⁵ This causal link is similar to the one suggested informally by [Bhagwati \(1990\)](#) that “concessions to the foreign exporters,” through a reduction in home country tariffs, “may create new interests that counterbalance the interests that oppose trade liberalization” there.

⁶ Separately, the role of sunk costs in political organization and the endogenous formation of lobbies in response to improved economic incentives to do so has been analyzed recently in the empirical investigation of the 1934 Reciprocal Trade Agreements Act (RTAA) by [Irwin and Kroszner \(1997\)](#).

1975, 1977; Coates and Ludema, 1997). In this context, the recent experiences of many developing countries also seem relevant. Following trade barrier reductions by full-obligation (i.e., developed country) GATT members in the several GATT rounds, there have been dramatic reductions of trade barriers by many developing countries that were exempt from the obligation to reciprocate by the articles (specifically, Article XVIII) of the GATT.⁷ This is roughly consistent with the theoretical predictions of the model: Unilateralism may be reciprocated even in the absence of a formal obligation to do so.

We should note also the similarity in motivation of our work with that of Coates and Ludema (2001), who study the impact of unilateral tariff reduction on *negotiation* outcomes (specifically the likelihood of success of achieving bilateral agreements in the presence of the “political risk” of domestic opposition to trade agreements) and argue that unilateral trade liberalization may be the optimal policy for a large country. In their framework, “unilateral liberalization acts as insurance” by providing a “risk-sharing” role. Unilateral tariff reduction lowers the political stakes associated with trade liberalization in the foreign country, thereby lowering the overall political cost of reaching and implementing trade agreements and increasing the probability of successful agreements.

To sum up, we believe the contribution of the paper to be threefold: It is among the first formal analyses of the interaction between unilateralism and reciprocal liberalization that we are aware of. Second, in studying this interaction it articulates channels through which unilateralism could lead to the organization of export interests in partner countries and thus induce reciprocity—a result which we believe holds interesting normative implications. Finally, in serving as a potential explanation for some well-known historical episodes of trade reform that we have mentioned, we believe that our paper has some positive significance as well.

Before proceeding with the formal model, we should note a point regarding the modeling strategy here: While we treat explicitly the formation of lobbies and tariffs in the “small” economy, the tariff reduction in the large economy is modeled as being *exogenous* (i.e., the level of the tariff imposed by the large open economy is taken as given by agents in the small country). This is done for analytical convenience since it appears to us to be the simplest framework within which to communicate the central idea of the paper—i.e., that there exist channels through which tariff reductions in one country (however they come about) could lead to reciprocal tariff reductions by its partners. However, even taking this assumption of “exogenous tariff reduction” literally, several examples may be offered in justification: Thus, for example, the model may be interpreted as representing a situation in which developed country GATT members negotiate tariff reductions amongst themselves and bind their tariffs at the end of such negotiations. Developing country members are beneficiaries of these tariff reductions due to the most favored nation (MFN) principle of the GATT, but may not be under full obligation to reciprocate (due to Article XVIII of the GATT). The possible reciprocity (in the form of tariff reductions by the developing countries, for instance) that may nonetheless be induced by such tariff reductions by developed countries is what this model studies. An alternate interpretation is to think of the

⁷ The relevance of interest groups in trade policy determination in developing countries has been established in a number of recent empirical papers, including De Melo et al. (2001) and Mitra et al. (2002).

model as studying the effects on partner countries of tariff reductions that may occur in certain countries due to regime shifts involving ideological changes (the ascension of committed free traders into political power, for instance). A third interpretation is to think of the model as studying the impact of trade policy changes undertaken by some countries due to conditionality imposed on them by international bodies such as the International Monetary Fund as part of a larger scheme to restructure the economy. In each of these cases, one may argue that agents in the partner countries (i.e., lobbies) take the tariff changes as being given rather than being endogenous to their own actions.

The rest of the paper proceeds as follows: Section 2 outlines the basic model describing endowments, technology and preferences in a small economy that is involved in trade with a “large” partner. Section 3 discusses the endogenous formation of lobbies and trade policy in the small country and derives the initial equilibrium. Section 4 demonstrates the scope for reciprocal liberalization by the small country when tariffs are liberalized by its large partner. Section 5 discusses the normative implications of this reciprocity mechanism for tariff policy in the large country. Section 6 describes the results of simulation analysis conducted with a view to exploring the implications of our framework under circumstances (i.e., initial conditions) other than those we focus on in the main section of the paper. Section 7 concludes.

2. The model

Consider a small open economy producing a numeraire good z with Ricardian technology and two non-numeraire goods (an import-competing and an exportable good), x_m and x_e ,⁸ each requiring a different kind of factor of production specific to that good and labor for their production. Individuals in this economy are assumed to have identical preferences with their utility functions taking the following form:

$$U = c_z + \sum_i u_i(c_{x_i}), \quad i = m, e,$$

where c_z is consumption of the numeraire good, c_{x_i} is consumption of good x_i and $u_i(c_{x_i})$ denotes the sub-utility derived from the consumption of the i th non-numeraire good ($u' > 0$ and $u'' < 0$). Consumers then solve the following optimization problem:

$$\max_{c_z, c_{x_i}} U = c_z + \sum_i u_i(c_{x_i}) \text{ subject to } \sum_i p_i c_{x_i} + c_z = E \quad (1)$$

where E is total income and where p_m and p_e denote the domestic prices of the two non-numeraire goods (the world price of goods x_i is assumed to be exogenously given at p_i^*).

⁸ As is standard in the literature, it is assumed that this numeraire good is freely traded between countries—indeed it is exchanges of this “numeraire” good that serve to settle the balance of trade. Thus, this good may be imported or exported by any country based on its balance of trade in the remaining goods. Regardless, we use the terms importable good and exportable good in this paper to refer exclusively to the goods x_m and x_e , respectively.

From the first-order conditions, we have demand for the non-numeraire goods given by:

$$c_{x_i} = d_i(p_i)$$

where $d(\cdot)$ is the inverse of $u'(\cdot)$.

The demand for the numeraire good, in turn, is given by

$$c_z = E - \sum_i p_i d_i(p_i). \quad (2)$$

Given our assumption regarding the form of the utility function, the indirect utility function is given by

$$v(\mathbf{p}, E) = E + \sigma(\mathbf{p}), \quad (3)$$

where $\mathbf{p}=(p_m, p_c)$ is the vector of domestic prices of the non-numeraire goods and

$$\sigma(\mathbf{p}) = \sum_i u_i(d_i(p_i)) - \sum_i p_i d_i(p_i), \quad (4)$$

is consumer surplus.

As stated earlier, good z is manufactured using labor alone under constant returns to scale (CRS). We set the input–output coefficient equal to one by choice of units (i.e., $z=L_z$), so that the wage rate $w=1$ in a competitive equilibrium. The output of each non-numeraire good is given by the following production function

$$x_i = F_i(K_i, L_i) \quad (5)$$

where K_i is the sector specific factor used in the production of the i th good and L_i is the amount of labor used in the i th good. $F_i(\cdot)$ is assumed to be CRS and subject to diminishing returns to each factor.

The quantity of each non-numeraire good supplied domestically is then given by:

$$x_i = x_i(p_i) = \pi'_i(p_i) \quad (6)$$

where $\pi_i(p_i)$ is the profit function and gives the total reward to K_i .⁹

Individual income in this economy is augmented by lump-sum (and uniform) redistribution of income derived from trade taxes and subsidies.¹⁰ The net revenue from taxes and subsidies, expressed on a per capita basis, is given by

$$\tau(\mathbf{p}) = \sum_i (p_i - p_i^*) [d_i(p_i) - (1/N)x_i(p_i)] \quad (7)$$

where N is the total population and p_i^* denotes the world price of good i .

⁹ It can easily be shown that $\pi''_i(p_i) > 0$, i.e., the profit function is convex with respect to price—a property that we will use later in deriving our results.

¹⁰ Following Grossman and Helpman (1994), we assume that the only policy instruments available to politicians are trade taxes and subsidies.

Thus, if l^h represents individual h 's endowment of labor and if s_i^h denotes its share of the i th specific factor, the income of this individual is then given by

$$E^h = l^h + \sum_i s_i^h \pi_i(p_i) + \tau(\mathbf{p}) \quad h = 1, 2 \dots N. \tag{8}$$

Finally, the indirect utility function of individual h is given by

$$v^h(\mathbf{p}) = l^h + \sum_i s_i^h \pi_i(p_i) + \tau(\mathbf{p}) + \sigma(\mathbf{p}) \tag{9}$$

To get to endogenous determination of tariffs and lobbies, we make some simplifying assumptions regarding the structure of endowments and ownership of specific factors in this economy. First, we assume that each individual in the economy is endowed with exactly l units of labor. Further, we assume that each individual owns only *one* type of specific factor and that owners of any particular type of specific factor are symmetric (that is, they own identical amounts of that specific factor). Letting θ denote the fraction of the population that owns the kind of specific factor used in the production of the importable and $1 - \theta$ denote the proportion of population that owns the other specific factor,¹¹ we have the total gross welfare of the set of individuals owning the i th specific factor to be given by

$$\Omega^i(\mathbf{p}) = \alpha_i N l + \pi_i(p_i) + \alpha_i N [\tau(\mathbf{p}) + \sigma(\mathbf{p})] \tag{10}$$

where

$$\alpha_i = \begin{cases} \theta & \text{when } i = m \\ 1 - \theta & \text{when } i = e \end{cases}$$

3. Determination of the structure of lobbies and protection

As in Grossman and Helpman (1994), the government is assumed to care about the total level of political contributions that it may receive and about aggregate well-being. The government values contributions because they can be used to finance campaign spending or provide other direct benefits to office holders. Social welfare is of concern to the

¹¹ Thus, we assume that the entire population owns some specific factor. As will quickly become evident, this delivers strong results with changing lobby structure. However, we should note that the qualitative spirit of our results is preserved even with greater concentration of ownership of specific factors, i.e., if $\alpha_c + \alpha_m < 1$. Further, even at very high levels of concentration of ownership of factors, i.e., with $\alpha_c + \alpha_m$ approaching zero, the qualitative spirit of our results is maintained if we include and consider other features—such as intermediate inputs which are importables or the potential formation of consumer lobbies.

government since voters would more likely re-elect a government that has delivered a high standard of living. A linear objective function is assumed to represent these preferences:

$$\Omega^G(\mathbf{p}) = \left[\sum_{i \in A} C_i(\mathbf{p}) + a\Omega^A(\mathbf{p}) \right]$$

where A is the set of organized interest groups (lobbies), $\Omega^G(\mathbf{p})$ is the objective function of the government, $\Omega^A(\mathbf{p})$ is aggregate gross social welfare,¹² $C_i(\mathbf{p})$ is the contribution schedule of the i th lobby and a is the weight the government attaches to aggregate social welfare relative to political contributions. Clearly, the higher is a , the higher its concern for social welfare relative to its affinity for political contributions.

We are interested in the political equilibrium of the following three-stage non-cooperative game. In the first stage, specific factor owners in a sector decide whether to contribute to the financing of the fixed and sunk costs (defined in labor terms) of forming an organized lobby. This fixed cost consists of the costs of forming an organization, establishing links with politicians, hiring professional lobbyists, building a communications network among members, designing a scheme of punishments for defaulting members, etc. Forming a lobby can also be one way of getting closer to the government, so that political influence can be exercised on government's decision making. A lobby can be considered to be an organizational set up to reduce transactions costs in lobbying activity, coordinate campaign contributions and communicate political "offers" to the politicians. In sectors without lobbies, the individual owners consider themselves too small to communicate their offers or persuade the government to formulate economic policy one way or the other, since the transactions costs for these to be done at the level of the individual may be very high.

In the second stage, lobbies choose their political contribution schedules. As in Grossman and Helpman (1994), it is assumed that each organized industry provides the government with a contribution schedule that *truthfully* reveals its preferences taking into account the government's objective function. Finally, in the third stage, the government sets trade policy to maximize a weighted sum of political contributions and overall social welfare.

The problem is solved by working backwards, i.e., by starting from the third stage. Here, the government, facing the contribution schedules of organized lobbies, solves the following problem:

$$\max_{\mathbf{p} \in P} \Omega^G(\mathbf{p}) = \left[\sum_{i \in A} C_i(\mathbf{p}) + a\Omega^A(\mathbf{p}) \right] \quad (11)$$

where P is the set of domestic price vectors from which the government may choose. As already noted, attention in this paper is restricted to equilibria that lie in the interior of P .

¹² Since this paper is eventually concerned with causes and consequences of lobby formation, we shall shortly introduce additional notation in the form of subscripts attached to Ω that denote which lobbies are operational at any given time.

In the prior stage, lobbies are assumed to choose truthful contribution schedules. The schedule for each lobby $i \in A$ is given by

$$C_i(\mathbf{p}) = \max(0, \Omega_i(\mathbf{p}) - b_i)$$

where the scalars b_i 's (the net welfare anchors for the different lobby groups) are determined in equilibrium. As in Grossman and Helpman, we focus on equilibria where lobbies make positive contributions. In other words, in the neighborhood of the equilibrium,

$$C_i(\mathbf{p}) = \Omega^i(\mathbf{p}) - b_i. \tag{12}$$

Substituting Eq. (12) into Eq. (11), we have,

$$\max_{\mathbf{p} \in P} \Omega^G(\mathbf{p}) = \left[\sum_{i \in A} (\Omega^i(\mathbf{p}) - b_i) + a\Omega^A(\mathbf{p}) \right] \Rightarrow \max_{\mathbf{p} \in P} \left[\sum_{i \in A} \Omega^i(\mathbf{p}) + a\Omega^A(\mathbf{p}) \right] \tag{13}$$

The solution to this maximization problem yields the following expressions for trade taxes and subsidies, t_i (Grossman and Helpman (1994)):

$$\frac{t_i}{1 + t_i} = \frac{I_i - \gamma}{a + \gamma} \cdot \frac{1}{\mu_i \epsilon_i} \tag{14}$$

where γ is the proportion of the population that belongs to any organized lobby in equilibrium, μ_i and ϵ_i denote the ratio of imports to domestic production and the absolute value of the price elasticity of import demand, respectively, if $i = m$, and denote the ratio of exports to domestic production of the exportable and the absolute value of the elasticity of export supply if $i = e$ instead. I_i is an indicator variable which takes a value of one if the i th sector is organized and zero otherwise.

The immediate implication of Eq. (14) is that if both the exporting and importing sector in our framework are organized, we have *free trade*—since $\gamma = 1$ and I_i takes on the value of one for both sectors. This can be seen intuitively from Eq. (13). We know that when both lobbies are formed, the government is simply maximizing the weighted sum of overall welfare on the one hand and the sum of the surplus that accrues to each group on the other. This is simply a multiple of overall welfare anyway—which is maximized with free trade.

We are interested in understanding what the implications are of a reduction in tariffs by a large partner country on the equilibrium structure of tariff protection in this country. To begin with, we assume that at least one sector is organized. Without loss of generality, let us assume that only the *import-competing sector* is organized to begin with.¹³ Eq. (14) gives us then that the trade regime is one that favors the import competing sector and in

¹³ As we discuss in the next section, the spirit of our theoretical results is unaffected if we start instead with only the exporting lobby being organized. However, as Rodrik (1995) notes, it is a stylized fact that the vast majority of trade regimes that were liberalized in the recent years started with regimes in which the import-competing sector enjoyed significant protection.

which the exporting sector is effectively taxed. The import tariff, t_m , and the export tax, t_e , are given respectively by:

$$\frac{t_m}{1 + t_m} = \frac{1 - \theta}{a + \theta} \cdot \frac{1}{\mu_m \epsilon_m} \tag{15}$$

$$\frac{t_e}{1 + t_e} = \frac{-\theta}{a + \theta} \cdot \frac{1}{\mu_e \epsilon_e} \tag{16}$$

Note that here, the tariff on imports, t_m , is positive and the protection to the export sector, t_e , is a negative number—indicating that it is a tax on exports. In both cases, $(1 + t_i)$ denotes the ratio p_i/p_i^* .¹⁴

We now go back to the first stage and analyze conditions under which we may have lobby formation (of the export lobby) itself, *taking the import sector as organized*.¹⁵ To save on notation, for the present analysis, we set (without any loss of generality) the world price of the importable good to be one.¹⁶ We also let $p_e^* = p^*$. Thus, p^* now denotes the world relative price of the exportable. In this context, members of the exportable group decide whether to form a lobby or remain unorganized. To form the lobby, they face a fixed labor cost denoted by F . Nash interaction among group members is assumed in their contribution decisions towards the provision of the fixed labor cost of lobby formation. However, once the lobby is formed, it is assumed here that the lobby machinery can enforce perfect coordination among the members of that group in the collection of political contributions, i.e., given the symmetry of capital ownership by members within a group, the lobby machinery can enforce collection of equal amounts of political contributions from each capitalist in the sector. To compare the costs and benefits of lobby formation, we set up some additional notation as promised: Using “ \sim ” to denote equilibrium values, we let $\tilde{\Omega}_{ij}^k$ denote equilibrium gross welfare of the k^{th} sector with both lobbies in place, $\tilde{\Omega}_i^k$ denote its equilibrium gross welfare with only the i^{th} lobby in place and $\tilde{\Omega}^k$ denote its equilibrium gross welfare with no lobbies in place. Finally, we let \tilde{C} denote the export lobby’s equilibrium political contribution.

Now, depending upon the magnitude of the fixed costs relative to the benefits of lobby formation, there are three possibilities:

(1) The benefit to any one individual within the exportable lobby exceeds the cost of forming the lobby. Here, contributing to the full financing of the fixed cost F is the only Nash equilibrium outcome among the group members, i.e., a lobby is always formed when,

$$(\tilde{\Omega}_{m,e}^e - \tilde{\Omega}_m^e - \tilde{C}) / (1 - \theta)N > F.$$

¹⁴ Henceforth when we talk of a higher export tax, we mean a higher absolute value of the tax in Eq. (16).

¹⁵ Again, it is straightforward to do a similar analysis of the incentives for the import-competing sector to organize taking the export sector as organized. This is discussed in greater detail at the end of Section 4.

¹⁶ This is, of course, consistent with the small country assumption made here. In Section 5, where we consider a large country trading with a large number of small open economies instead, we allow the world price of the importable good to vary.

(2) Alternately, the cost of lobby formation exceeds the benefit to any one individual but is less than the total benefit to the lobby, i.e.,

$$\tilde{Q}_{m,e}^e - \tilde{Q}_m^e - \tilde{C} > F > (\tilde{Q}_{m,e}^e - \tilde{Q}_m^e - \tilde{C}) / (1 - \theta)N$$

In this situation, there are two possible Nash equilibrium outcomes—either there is no contribution to the provision of the lobby or the fixed cost is fully financed. We assume that pre-play communication can take place. For example, when capitalists in an industry feel that they are going to benefit from forming a lobby, they start communicating with each other—write letters, make phone calls, etc. Hence, one can use some popular communication-based refinements here. The better equilibrium for the group (i.e., the lobby is formed) satisfies the conditions for the three popular communication-based refinements—coalition proof Nash, strong Nash and the Pareto-dominance refinement, and hence, group coordination becomes the likely equilibrium outcome.¹⁷

(3) The cost of forming the lobby exceeds the benefit of lobby formation to the group, i.e.,

$$\tilde{Q}_{m,e}^e - \tilde{Q}_m^e - \tilde{C} < F.$$

The Nash equilibrium outcome is obviously “not providing the lobby” since the total benefit is less than the total fixed costs. From the analysis of the above three cases, the conclusion that emerges is that a lobby is formed under the following condition:

$$\tilde{Q}_{m,e}^e - \tilde{Q}_m^e - \tilde{C} > F. \tag{16}$$

Having described the initial equilibrium that we focus on and having derived conditions under which an (initially non-existent) export lobby may be formed, we proceed to analyze the impact of unilateral trade reform on this initial equilibrium.

4. Unilateral tariff liberalization, terms of trade changes and endogenous lobby formation

We are interested in how a unilateral tariff reduction by a large partner country (leading to an improvement in the export price p^* faced by the “small” home country) may affect the initial equilibrium. In particular, we are interested in how this may affect the equilibrium structure of lobbies and finally the equilibrium structure of tariffs.

¹⁷ Bernheim et al. (1987) look at an important class of “non-cooperative” environments where players can freely discuss their strategies, but cannot make binding commitments. They introduce a refinement of the Nash set, the concept of coalition-proof Nash equilibrium. An agreement is coalition-proof if and only if it is Pareto efficient within the class of self-enforcing agreements. In turn, an agreement is self-enforcing if and only if no proper subset (coalition) of players, taking the actions of its complement as fixed, can agree to deviate in a way that makes all its members better off. A more demanding refinement is the strong Nash refinement which requires that no coalition (including the whole set), taking the actions of its complement as given, can cooperatively deviate in a way that benefits all of its members. The Pareto dominance refinement requires that the Nash equilibrium is Pareto efficient among all possible Nash equilibria.

To get to this, however, we need to develop a little additional notation. Thus, we let NB represent net benefit from lobby formation for the exportable sector. NB is net of political contributions, but gross of fixed costs. This net benefit is therefore given by

$$NB = \tilde{Q}_{m,e}^e - \tilde{Q}_m^e - \tilde{C} \tag{17}$$

With truthful contributions, as in Grossman and Helpman (1994), the equilibrium contribution level by the exportable sector when organized is given by

$$\tilde{C}(p^*) = \tilde{Q}_{m,e}^e(p^*) - \tilde{b}_e(p^*) \tag{18}$$

where \tilde{b}_e is the net (of contributions) welfare or payoff anchor (determined in equilibrium) of the contribution schedule of the exportable group when organized. Note that this is different from the net benefit (gross of fixed costs) from lobby formation, NB, which is the difference between the net payoff $\tilde{b}_e = \tilde{Q}_{m,e}^e - \tilde{C}$ received as an organized group and the net payoff \tilde{Q}_m^e as an unorganized group. Note also that the endogeneity of trade taxes and subsidies and thus domestic prices implies that equilibrium values of group welfare and contributions can now be written as functions of only the world price of the exportable, rather than as functions of domestic prices and trade taxes.

Importantly, with truthful contributions, any lobby when formed will have to pay the government an amount that makes it indifferent between treating that lobby as organized and treating it as unorganized, given the contribution schedule of the other lobbies.¹⁸ Thus, from Eq. (14), we know that the export lobby should compensate the government for the reduction in the import lobby’s welfare due to its entry and for changes in overall social welfare. Therefore, the contribution of the export lobby is given by:

$$\tilde{C} = \tilde{Q}_m^m - \tilde{Q}_{m,e}^m + a(\tilde{Q}_m^A - \tilde{Q}_{m,e}^A) \tag{19}$$

where the superscript “A” stands for aggregate as before. We can now state our first proposition:

Proposition 1. *With a pre-existing import-competing lobby, the net benefit to the exporting sector from the formation of an export lobby (gross of fixed costs) is proportional to the sum of the deadweight losses created (relative to the free trade level) in the importable and the exportable sectors by the equilibrium trade policies that result when only the import-competing sector is organized.*

This is seen by substituting Eq. (19) into Eq. (17). The net benefit to the export lobby from lobby formation can then be written as:

$$NB = \tilde{Q}_{m,e}^e - \tilde{Q}_m^e - [(\tilde{Q}_m^m - \tilde{Q}_{m,e}^m) + a(\tilde{Q}_m^A - \tilde{Q}_{m,e}^A)] = (a + 1)(\tilde{Q}_{m,e}^A - \tilde{Q}_m^A) \tag{20}$$

where the second equality derives from our assumption that all members of society own at least one specific factor. Eq. (20) tells us that the net benefit from lobby formation can

¹⁸ This is analogous to the well-known Clark–Groves mechanism. See Bernheim and Whinston (1986) for a discussion.

simply be expressed in terms of the change in aggregate welfare due to the formation of the lobby. Since our utility functions are quasi-linear, aggregate change in welfare can simply be expressed in terms of surplus changes. The above expression for net benefit can then be usefully modified as follows:

$$NB = (a + 1)(\Delta_m + \Delta_e) \tag{21}$$

where Δ_m and Δ_e are the dead weight losses created in the importable and exportable sector, respectively, when only the importable sector is organized relative to when both lobbies are organized (i.e., the free trade level). This proves our proposition.

Our assumption regarding the initial equilibrium is equivalent to assuming that at the initial level of world prices, $NB < F$, that is, that the net benefit from lobby formation is less than the fixed cost of lobby formation and so the lobby does not form. The particular exercise that we wish to undertake relates to the effects of unilateral liberalization by a large partner country. As such, this would raise the world price of the small country’s exportable good. To see how this may affect the incentives for lobby formation, we take the derivative of the above expression with respect to p^* . Then, under the additional *sufficient* assumption (which we discuss shortly) that $E_s(\cdot)'' \geq 0$ where E_s is export supply from the small country, we have our second proposition:

Proposition 2. *The net benefit from lobby formation to the exporting sector, NB, is increasing in the world price of the exportable, p^* .*

Noting that the deadweight loss in the import competing sector, Δ_m , does not depend upon p^* , and noting that the deadweight loss in the other sector can simply be expressed as a function of the world price of the exportable and the absolute value of the per unit tax on the exportable, $T = |p^*t_e|$, we have;

$$\frac{dNB}{dp^*} = (a + 1) \frac{d\Delta_e}{dp^*} = (a + 1) \left(\underbrace{\frac{\partial \Delta_e}{\partial T}}_{>0} \cdot \underbrace{\frac{dT}{dp^*}}_{>0} + \underbrace{\frac{\partial \Delta_e}{\partial p^*}}_{>0} \right) > 0 \tag{22}$$

Eq. (22) has three components on the right-hand side which need to be signed:

The first component is the change in the dead weight loss in the exportable sector due to an increase in the absolute value of the tax. It is straightforward to see that this is positive.

The second component is the change in the absolute value of the export tax for a given change in international export prices. This is positive as well. While we save a formal proof for the Appendix A.1, we can state the intuition here: The reason that T is increasing in p^* is that at a high world price for the exportable, the gain to the organized group from a given reduction in the price of the exportable good is higher. This leads to more vigorous lobbying by the importable sector for a higher per unit export tax (since they are consumers of this good). In turn, this leads to a higher per unit export tax. This can be seen clearly in Fig. 1 which represents changes in surplus and tariff revenues at two different levels of the world price of the exportable, p^* , holding the per unit tax, T , fixed. Note first that changes in p^* affect the import-competing sector through changes in

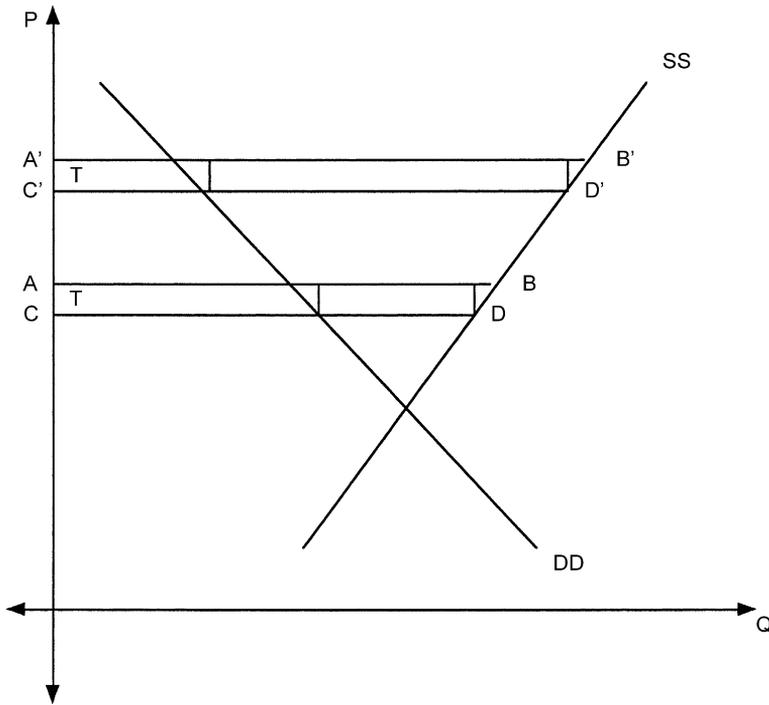


Fig. 1. Domestic demand and supply curves for the exportable good.

consumer surplus and tariff revenues (i.e. area ABCD minus the two Harberger triangles). Note further that change in surplus to this sector is a fixed proportion (i.e., the ratio θ) of the overall change (since all individuals in this economy consume goods in identical fashion and get the same share of tax revenues). Thus, at a higher p^* , for a given T , the change in surplus overall is higher (since $A'B'C'D' > ABCD$ and the Harberger triangles are the same area). This implies a higher change in surplus to the import lobby. Thus there is a greater incentive to lobby for a higher export tax, which results in a higher per unit export tax, T , in equilibrium.¹⁹

As we show in Appendix A.2, the third term $\partial \Delta_e / \partial p^*$ is always ≥ 0 if $E_s'' \geq 0$, a condition that we assume here but that can be argued to be satisfied under fairly general conditions. To see this we note first that the condition holds for the linear supply and demand case where $E_s'' = 0$. Further, as we show in Appendix A.3, with constant export supply elasticities, for $E_s'' > 0$, we need that $\epsilon_s > 1$ where ϵ_s denotes export supply elasticity.

¹⁹ We should point out that this holds even under alternate assumptions regarding tariff revenue redistribution. To see this, assume that the government holds onto tariff revenue instead of redistributing it uniformly to individuals. Now, with an increase in the world price of the exportable, the import-competing sector by itself would have less reason to lobby for an export tax (since its consumer surplus gain from such a tax on the margin is smaller). However, if it is assumed that the government places a premium on tariff revenues, then the government has a strong motivation to raise the export tax. On balance, with a strong enough emphasis on tax revenues placed by the government, the export tax would go up.

As we argue further in Appendix A.3, the condition that $\epsilon_s > 1$ itself should be satisfied for a very wide range of domestic supply and demand elasticities.²⁰ Conditions under which $E_s'' \geq 0$ holds even with non-constant export supply elasticities are discussed in Appendix A.3 as well.

Combining the three effects, we have that,

$$\frac{dNB}{dp^*} > 0$$

meaning that the net benefits to the export sector of forming an export lobby increase in p^* . This too can be seen from Fig. 1. Raising p^* , holding T fixed, the export lobby sees a larger reduction in producer surplus ($A'B'C'D'$ instead of $ABCD$) thereby increasing the incentive of the export lobby to form a lobby and lobby against the tax. Further, as we have already explained, the per unit export tax increases as p^* goes up, increasing the incentive to form the lobby even further.

Now, knowing that

$$\frac{dNB}{dp^*} > 0,$$

we let $p^* = \bar{p}$ solve the following equation:

$$NB(p^*) = F. \tag{23}$$

This allows us to state our third proposition:

Proposition 3. *When tariff reductions by the unilaterally liberalizing large country raise the world price of the small country’s exportable (p^*) beyond \bar{p} , this unilateralism is reciprocated: the small partner country moves to free trade.*

This follows directly from Eqs. (22) and (23). From these, we know that when $p^* \geq \bar{p}$, the exportable sector gets organized. Now with both export and import sectors organized, there is *free trade*.^{21,22}

²⁰ We should note here that even if we abandon our assumption regarding the curvature of the export supply function and it turns out to have the opposite sign (i.e., $E_s'' < 0$), NB would be increasing in p^* if the product of the first and second terms (both unambiguously positive) dominates.

²¹ Note, interestingly, that this move towards free trade need not always be welfare improving for the small partner country. Thus, imagine that the initial world price of the exportable is just below \bar{p} and that unilateral liberalization by the large country raises it to a level just above \bar{p} , so that NB just exceeds F . We know that the small country’s export lobby would now form and in doing so will undertake a fixed resource cost of F . Gross aggregate welfare goes up by $(\Delta_m + \Delta_c)$. However, the fixed cost in this case would only be slightly below the net benefit to the export lobby which is given by $NB = (a + 1)(\Delta_m + \Delta_c)$ and is therefore greater than $(\Delta_m + \Delta_c)$.

²² With the specific assumptions on technology and preferences made here for the small country (and under identical assumptions for the large country), it is easy to show that we do not encounter the “Lerner case” and that a tariff reduction by the large country does increase the price of the small country’s exportable in world markets.

This establishes our primary result that unilateral liberalization by a large partner country within this framework will induce reciprocal liberalization.²³ Profiles of the net benefit from lobby formation and the per unit trade taxes as functions of p^* are illustrated in Fig. 2. As shown there, once the export price, p^* , rises above the threshold level, i.e., once $p^* \geq \bar{p}$, we have free trade.²⁴ It may be noted that given the profile of export taxes, a gradual liberalization may generate an adverse initial welfare impact on the large country (if the partner were large enough) before bringing benefits.

It is also useful to interpret the political economy mechanism just stated in terms of how the welfare level of the exportable group varies with the world price of the exportable differently when this group is organized than when it is not. Fig. 3 illustrates that an increase in the world price of the exportable increases welfare of the exportable group whether it is organized or unorganized (see Krishna and Mitra, 2003 for a detailed mathematical derivation). Thus, the welfare levels are shown with positive slopes. Note that the welfare level of the exportable group when organized (net of political contributions but gross of the fixed cost of lobby formation) is higher than when it is not organized. Note also that NB increasing in p^* implies that the welfare locus when unorganized has flatter slope—implying, in turn, with large enough fixed costs, some point of intersection with the welfare locus when organized (net of both fixed costs and political contributions). The price at which this takes place is, again, \bar{p} . Beyond this price, the lobby is formed. Below it, it is not.

In the preceding discussion, in demonstrating the possibility that unilateral liberalization by a large country may induce reciprocity by its partner, we have made a number of explicit and implicit assumptions. The unilaterally liberalizing country was assumed to be large enough to affect world prices and, indeed reciprocal liberalization was shown to obtain only when tariff liberalization drove the world price p^* above the threshold level, \bar{p} (which, it may be noted, need not happen even with full liberalization by the large country). Further, in order for there to be some connection between export and import lobbies (crucial for the mechanism we have proposed), it was assumed that lobbies are large enough (i.e., that α is big enough) for lobby owners to care about the prices of goods they consume—although, as we have discussed before, this will be the case even if each lobby was small but used output from the other sector as an intermediate in its own production. A sufficiency condition regarding export supply elasticities was stated and assumed to hold (and its empirical plausibility discussed). Finally, our analysis focused on the case where an active import lobby exists in the small country but there is no export lobby present. However, given Eq. (21), we can now discuss why our initial assumption regarding the pre-existence of the import-competing lobby rather than the exporting lobby is not crucial (see also Section 6 for a detailed discussion of alternate possibilities that

²³ Note that in the model, unilateral liberalization by one country results in reciprocity by the partner country through changes in the “demand” for protection in the partner country. However, one could interpret this as occurring through a change in the “supply” of protection instead. Specifically, with the formation of the export lobby, the final maximand of the “supplier” of protection, the government, changes—since it now takes into account contributions by this lobby as well. One could therefore think of this, loosely, as being an endogenous change in preferences of the supplier of the protection.

²⁴ As can also be seen in Fig. 2, when p^* is below the threshold level, the per unit export tax is rising with p^* —just as we have discussed earlier.

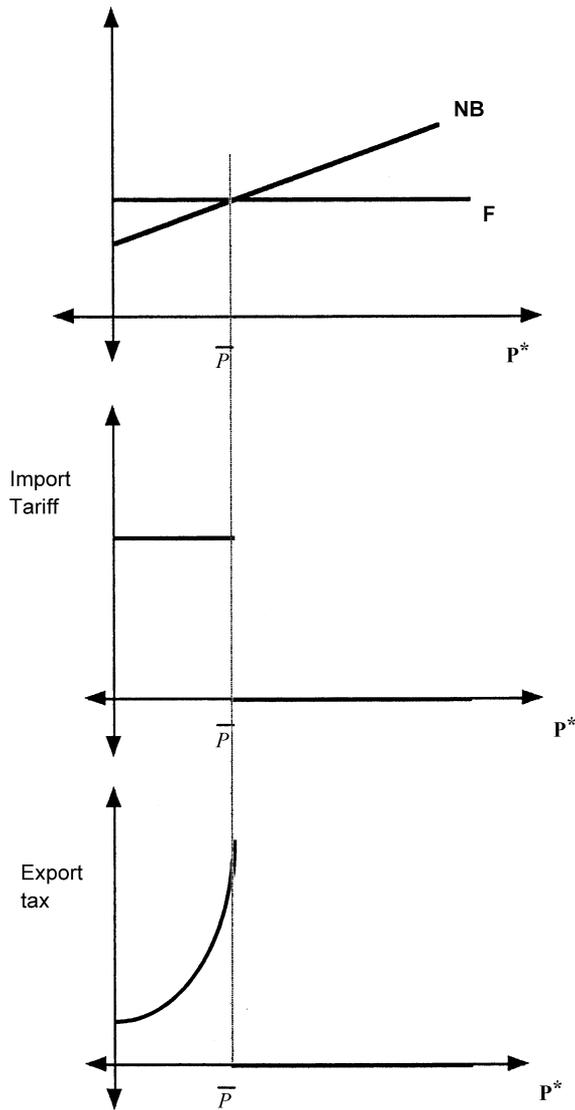


Fig. 2. Net benefits from lobby formation and trade taxes versus P^* .

emerge with different initial conditions): Taking the other group as organized, the net benefit from organizing for any group of specific factor owners is proportional to the total deadweight loss caused prior to its entry as an organized group. When the export sector is the only organized group, the deadweight loss created by this sector is increasing in the world price of the exportable as the per unit export subsidy increases with the world price of the exportable. This makes the net benefit from organizing for the second group (the import-competing lobby) increasing in the world price of the non-numeraire exportable.

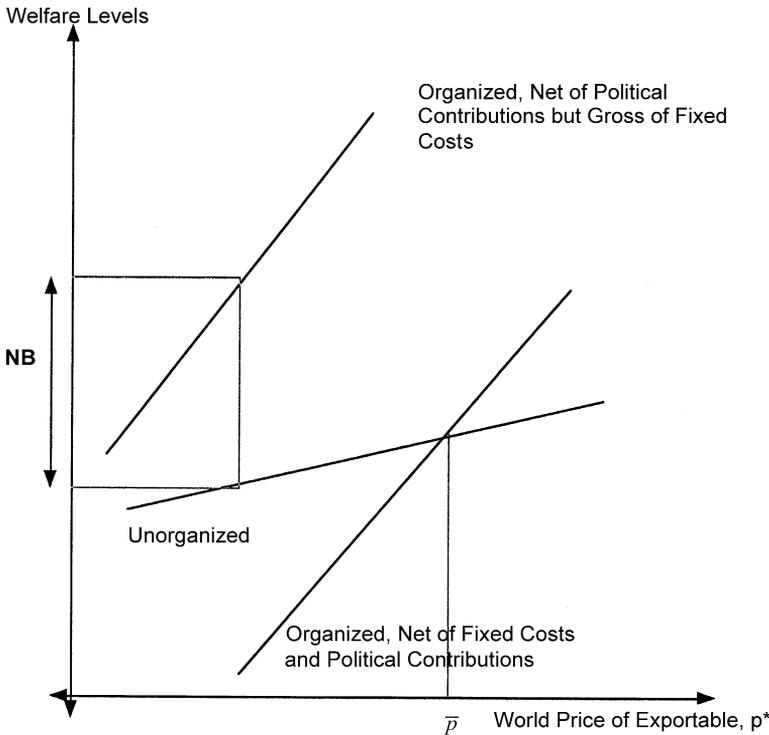


Fig. 3. Incentives for Lobby Organization.

This means that at a high enough world export price, we cannot have a single lobby equilibrium. In other words, if in the first stage, both groups decide on lobby formation simultaneously, we can only have a free trade political economy equilibrium in the small open economy at a high enough export price (see Section 6).^{25,26}

5. Normative implications

In the preceding sections, we have demonstrated the possibility that unilateral trade liberalization by a large country may induce reciprocal liberalization by its trading partner.

²⁵ It should be noted that although the per unit export tax in the small open economy increases with an increase in the world exportable price, this is not true about the ad valorem export tax, as can be seen from the equilibrium export tax expressions. For example, with a constant price elasticity of export supply, we have an ad valorem export tax that is decreasing in p^* . When we have linear demand and supply with the additional requirement that the supply passes through the origin, the ad valorem export tax remains constant. When this supply has a positive price intercept, the ad valorem tax is again decreasing in p^* .

²⁶ If the initial situation was one where no lobbies were organized, it is possible that a unilateral reduction in tariffs by the large country induces a single lobby to form—thus taking the small country away from its initial free trade regime. However, further reductions in tariffs should lead to the formation of the second lobby taking the small economy back to free trade.

Would the large country benefit from such reciprocity? Our maintained assumption that the trading partner of the unilaterally liberalizing large country is small, clearly precludes this possibility—the movement of any single small country to free trade does not affect world prices and is therefore of little consequence to the large country. The (induced) reciprocity mechanism we have discussed is not without potentially important normative implications for the large economy, however. Indeed, in a simple extension of our framework where the large country trades with a number of small countries (which are individually small but collectively large), we are able to show that with unilateral liberalization, the large country may benefit if its trade partners reciprocally liberalize their trading regimes.²⁷

Specifically, consider a situation in which the large open economy, A, trades with a continuum of small open economies (which are identical to each other with respect to technology, endowments and preferences) denoted by B. B's non-numeraire export good, e , and import good, m , are A's non-numeraire import and export goods, respectively.²⁸ Consider further, an initial situation in which import lobbies are organized in all the countries in B, but export lobbies are not. From Proposition 3, we have that the benefit of organization to export sectors (net of contributions but gross of fixed costs, F), NB , in B is decreasing in A's tariff, i.e., that $(\partial NB/\partial t^*) < 0$. With tariff reductions by A, if export lobbies in B get organized and move their countries to free trade, the collective size of these countries will bring terms-of-trade and thus welfare gains to A.

As we discuss in detail in Krishna and Mitra (2003), the responsiveness of countries in B to tariff reductions by A depends upon a number of parameters in the model. The movement of the various countries in B to free trade, may be, for instance, continuous or highly discrete. Nevertheless, setting aside concerns regarding stability and continuity for the moment (see Krishna and Mitra, 2003 for a comprehensive discussion), we can provide here a general discussion of how optimal tariff policy²⁹ for A may be modified in light of the reciprocity mechanism we have discussed so far. Two situations may be contrasted: one where the large country, A, chooses its tariffs taking the lobby structure in B as fixed and where the lobbies in the small open economies, B, are formed taking the large country's tariff as given (i.e., with simultaneous moves) and a second where A moves first, pre-committing to its tariff level, taking its effect on lobby formation in B into account (i.e., where A leads in Stackelberg-like fashion). In the present context (i.e.,

²⁷ The discussion that follows is intended as a brief and suggestive description of the results we have obtained regarding the normative implications of the reciprocated unilateralism mechanism. A detailed and formal treatment, dropped from this paper at the suggestion of our editor, can be found in Krishna and Mitra (2003).

²⁸ It is assumed that the general structure of the "large" economy is similar to that of the small open economies with which it trades (even though it may differ from them in endowments, the precise technologies used and in its exact preferences): Its consumers have quasi-linear and additively separable utility as in Eq. (1). It produces goods x_m and x_e using CRS technologies and employing sector specific capital and mobile labor and the numeraire good using Ricardian technology (just as in the small open economies). Also, we continue to assume that in each of the small open economies in B, trade policy is set in the political economy contexts discussed in the previous sections.

²⁹ It should perhaps be clarified that, given our normative concern, optimality here is in relation to the standard welfare-maximizing objective.

starting from an initial situation in which a large country trades with a number of identical small open-economies with politically organized import competing sectors) it can be shown that:

Proposition 4. *The large country's optimal (i.e., welfare maximizing) tariff is smaller when it takes into account its effect on the incentives for lobby formation in the exportables sector of its partner countries than when it takes the lobby structure in those partner countries as given.*

This follows intuitively from the discussion regarding the terms of trade gains to the large country that following reciprocal liberalization by its trading partners, which while individually small, are collectively large enough to impact world prices. Mathematical details (and a systematic analysis of the various possibilities that arise depending on the collective size of B in the markets for e and m) can be found in Krishna and Mitra (2003).

6. Simulations

Thus far, our argument regarding reciprocated unilateralism has been discussed in the context of particular (and, as we shall argue further below, empirically relevant) initial conditions. Specifically, the argument has been developed in the context of a small trading partner whose trade policy has been distorted due the *exclusive* initial presence of an import-competing lobby. A question arises here as to what happens under other different initial conditions. That is to say, what will be the effect of unilateral tariff liberalization by the large country if no lobbies are present in the small country initially? Or if it is an export lobby rather than an import lobby that is initially present? The complexity of the theoretical framework and multitude of parameters involved make analytical solutions to these questions hard to obtain and assess. However, simulation analysis using alternative functional forms and parameter values (treating the political organization decision of both the export and the import-competing lobby as endogenous) provides us with guidance on this issue. We discuss our findings below.

Our discussion of our findings using simulation analysis focuses on two illustrative cases. In both, demand functions and production functions are assumed to be linear and symmetric across sectors (see Appendix A.4 for details). We develop some additional notation as follows. $FNB_i(\cdot) = NB_i - F_i$ denotes the *full* net benefit (benefit from organizing net of contributions *and* fixed costs) with the subscript $i = m, e$ indicating the sector whose full net benefit function it is. Included within the parentheses are *all* the sectors which are organized once the sector under consideration gets organized (for example, $FNB_e(e)$ denotes the full net benefit to the export sector from forming its lobby when the import-competing lobby is not organized, and $FNB_e(m, e)$ denotes the full net benefits to the export sector from lobby formation when the import-competing sector is organized as well). To see the effects of unilateral tariff reductions by the large country, we hold the import price of the small open economy constant at unity and vary the export price, p^* .

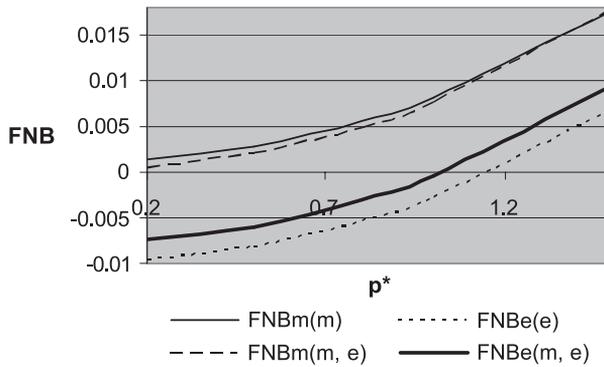


Fig. 4. $FNB = NB - F$ ($\theta = 1/3$, $a = 10$, $F(\text{export}) = 0.02$, $F(\text{import}) = 0.01$, export capital endowment = twice the import capital endowment).

In our first case (Fig. 4), our small open economy is assumed to have an endowment of capital (sector specific) in the exportable sector that is twice the amount of capital in the import-competing sector. We further assume that individuals in this economy own capital in identical amounts and in one or the other of the two sectors (but not both). Assuming further that the fixed cost of lobby organization, F , is proportional to the number of capital owners in a sector, we take the fixed cost of political organization in the export sector to be twice that in the import-competing sector. Fig. 4 presents the full net benefit curves as a function of the export price faced by the small open economy. The slopes of the full net benefit curves are positive for reasons that have already been discussed earlier in this paper. We can see from Fig. 4 that for low values of the export price, we have a unique equilibrium with just the import sector organized. As the export price rises, this initially continues to be the unique equilibrium—the FNB curves for the export sector (taking the import sector to be organized or not) are both below zero and the FNB curves for the import sector are both above zero. After $FNB_e(m,e)$ rises above zero with yet higher p^* , the export lobby gets formed and the unique equilibrium here involves the formation of both lobbies (with free trade as the trade policy outcome) since FNB curves for both lobbies, each taking the other as organized, are above zero. This scenario is consistent with the one that we have focused on in the paper so far and illustrates our main argument. Note, however, that if fixed costs were a bit higher in the import-competing sector, both the FNB_m curves would shift down uniformly and, at low values of p^* , the import-competing sector would not be organized. If this were the initial condition, a reduction in tariffs by the large country would now induce the import-competing lobby to form first. Although the small economy now enjoys better terms of trade, it will have moved from an efficient trade regime (with free trade) to an inefficient one and will have incurred additionally the fixed costs of lobby formation. This may appear to be damaging to the argument regarding the use of unilateralism to induce reciprocity, but this is not the case since, of course, the argument is only relevant when there are some tariffs being imposed by the partner country in the first place. Also, with further tariff reductions (i.e., increases in the world price, p^*), the export lobby gets formed as well (after FNB_e goes above zero)

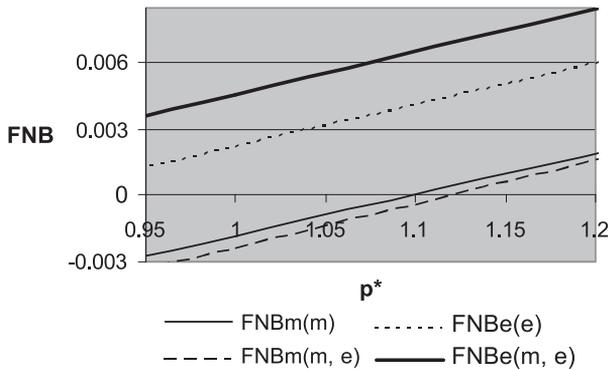


Fig. 5. $FNB = NB - F$ ($\theta = 1/3$, $\alpha = 10$, $F(\text{export}) = 0.015$, $F(\text{import}) = 0.02$, export capital endowment = twice the import capital endowment).

and we have free trade. Thus, with high enough tariff reductions by the large country, free trade obtains in the partner country (even if the path to this is non-monotonic and fixed costs of lobby organization have been incurred along the way).³⁰

In our second case, we continue to assume that the endowment of capital in the exportable sector is twice than in the importable sector. However, fixed costs of lobby organization for the export sector are assumed to be lower than that in the importable sector. As shown in Fig. 5, this gives us FNB curves for the exportable that are higher than those in the importable sector. Note that, as drawn, at low levels of p^* , it is now the export lobby that is organized while the import lobby is not. Trade policy is initially distorted with export subsidies and import subsidies. While it should be clear that this is an empirically nearly irrelevant case as virtually no countries can be characterized as having trade regimes of this nature, it is a clear theoretical possibility and so we analyze this nonetheless. Here too, a high enough increase in the world price of the exportable results in the formation of the import lobby with free trade emerging as the policy outcome. While such an outcome may benefit the small country, the large country would be faced with a policy regime less favorable to it. Finally, if fixed costs were a little higher, there would be no lobbies at low values of p^* . An increase in p^* would first lead to the formation of an export lobby which could be welfare worsening for the small country, causing it to move from free trade to a trade regime that was more favorable to the large country. Of course,

³⁰ We should note another interesting possibility that emerges in the setting just discussed. When only the import lobby is organized initially, an increase in tariffs by the large country also reduces the benefit to the import lobby of being active, as the FNB profiles show. To the extent that fixed costs of lobby organization are paid period by period, this suggests that tariff increases by the large country may also move the small country to free trade (if the import lobby drops out). However, if lobby organization costs are fully sunk, there will always be an incentive for the import sector to lobby (however small). The possibility of unilateral increases in tariffs by the large country leading to free trade in the partner then disappears.

further increases in p^* , as shown, will cause the formation of the import lobby as well and a movement back to free trade.

Finally, we should note that, for particular parameter values, other possibilities than those discussed in the two cases above arise as well. Specifically, with increases in p^* , it may be that we enter an intermediate zone where multiple equilibria are possible. Thus, the position of the FNB curves may be such that each lobby has an incentive to get organized only if the other lobby does as well. The outcome could then either be that both lobbies get organized or that neither does (with free trade as the policy outcome either way). In these cases too, however, it can be seen that with large enough values of p^* both lobbies get organized.

The simulations exercises, which examine a variety of “initial conditions,” leave us with the following conclusions. First, the argument regarding reciprocated unilateralism has normative relevance primarily in contexts where the unilaterally liberalizing country faces countries that impose restrictions on its exports. Else, if the initial situation is one of free trade in the small country, liberalization by the large country might lead to protection in its small trading partner or might maintain free trade there but with resources wasted in organizational costs and political contributions.³¹ Second, sufficiently large unilaterally tariff reductions can lead to free trade in the partner countries regardless of the initial conditions.

7. Summary and conclusions

Using the menu-auction approach to endogenous determination of tariffs pioneered by Grossman and Helpman (1994) and allowing for lobby formation itself to be endogenous, as in Mitra (1999), this paper analyzes the potential for unilateral trade liberalization by one country to impact trade policies in its partner in the absence of any formal agreement or communication between these countries.

We consider a large country trading with a small partner in which initially an organized import-competing lobby exists and where the trade regime is characterized by import tariffs (and export taxes). In this context, we find that unilateral liberalization by the large country may *induce* reciprocal tariff reductions by altering the political economy equilibrium there. Intuitively, unilateral liberalization by the large country has the effect of increasing the incentives for the export lobby in the partner country to form and to lobby effectively against the import-competing lobbies there for lower protection. Using simulation analysis, we confirm that the reciprocated unilateralism mechanism inducing the small country to move towards free trade may emerge even under quite different initial conditions than the ones considered centrally in the paper (although the path towards free trade may not always be monotonic, as we have discussed in Section 6). The induced reciprocity mechanism we have discussed has potentially important normative implications.

³¹ One policy implication that might arise here concerns the merit of a rules-based system in which countries are not allowed to raise their tariffs (i.e., tariff bindings are agreed to). In this case, a tariff reduction by the large country will never be reciprocated by tariffs by the partner.

Acknowledgements

For helpful discussions and comments, we are very grateful to Jagdish Bhagwati, Elhanan Helpman, John McLaren, Dani Rodrik, Robert Staiger, two anonymous referees, and to seminar and conference participants at the Board of Governors of the Federal Reserve, Boston College, Brandeis University, University of British Columbia, Brown University, University of California at Irvine, Columbia University, University of Connecticut, Dartmouth, Florida International University, INSEAD, Korea Development Institute, New York University, University of Notre Dame, Syracuse University, Yale University, the NBER's 1999 Summer Institute in Cambridge, MA, the AEA's 2000 meetings in Boston, the Fall 1999 Mid-West International Economics Conference at the University of Illinois at Urbana-Champaign, the Fall 1999 Southeastern International Economics conference at Georgetown University and the Ford Foundation-American Enterprise Institute conference on "Unilateralism: The Case for Relaxed Reciprocity." Pravin Krishna gratefully acknowledges the hospitality and the intellectual and financial support of the Center for Research on Economic Development and Policy Reform at Stanford University and the Research Department of the International Monetary Fund, where some of this research was conducted.

Appendix A

A.1. To prove: $(dT/dp^) > 0$*

Proof. From Eqs. (15) and (16), when only the import-competing sector is organized, the ad valorem import tax and the ad valorem export tax are given by:

$$t_m = \frac{1 - \theta}{a + \theta} \cdot \frac{x_m(p_m)}{[-p_m^* I'_m(p_m)]} \quad \text{and} \quad t_e = \frac{-\theta}{a + \theta} \cdot \frac{x_e(p_e)}{[-p_e^* I'_e(p_e)]}, \quad \text{respectively,}$$

where $I_m(p_m)$ is import demand and $-I_e(p_e)$ is export supply. Normalizing $p_m^* = 1$ and letting $p_e^* = p^*$, we can write the magnitude of the per unit export tax as

$$T = |p^* t_e| = \frac{\theta}{a + \theta} \cdot \frac{x_e(p_e)}{[-I'_e(p_e)]} = g(p^* - T).$$

We impose the restriction that an increase in the price of a commodity should increase the output supplied proportionally more than it increases the magnitude of the derivative of export supply with respect to price, so that $g' > 0$. This would always hold for linear demand and supply functions and also for most standard demand and supply functions.

Differentiating T with respect to p^* ,

$$\frac{dT}{dp^*} = \frac{g'}{1 + g'} > 0.$$

A.2. Sufficient condition for $(\partial \Delta_e / \partial p^*) > 0$, $E_s''(p) \geq 0$

From Fig. 6, we have deadweight loss in the exportable sector due to the export tax given as:

$$\begin{aligned} \Delta(T, p^*) &= \int_{p^*-T}^{p^*} E_s(p) dp - TE_s(p^* - T) \\ &= IE_s(p^*) - IE_s(p^* - T) - TE_s(p^* - T) \end{aligned}$$

where I stands for integral evaluated at a particular value.

$$\begin{aligned} \Delta_2(T, p^*) &= E_s(p^*) - E_s(p^* - T) - TE_s'(p^* - T) \\ \Delta_2 \geq 0 &\Leftrightarrow E_s(p^*) - E_s(p^* - T) \geq TE_s'(p^* - T) \\ &\Leftrightarrow \frac{E_s(p^*) - E_s(p^* - T)}{T} \geq E_s'(p^* - T). \end{aligned}$$

By the mean value theorem,

there exists $p' \in [p^* - T, p^*]$, such that $\frac{E_s(p^*) - E_s(p^* - T)}{T} = E_s'(p')$

where $p' \geq p^* - T$.

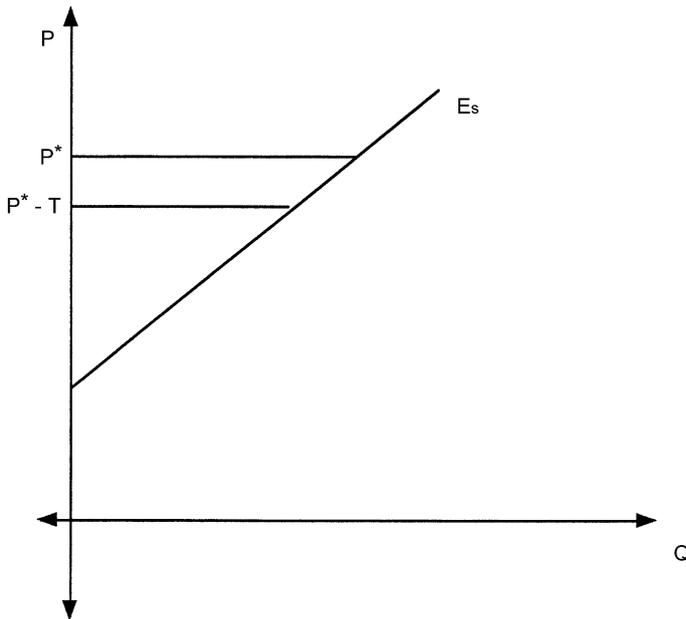


Fig. 6. Export supply curve.

Therefore,

$$E_s''(p) \geq 0 \Rightarrow E_s'(p^* - T) \leq E_s'(p) = \frac{E_s(p^*) - E_s(p^* - T)}{T}$$

which, in turn, implies that $\Delta_2 \geq 0$.

On necessary and sufficient conditions:

$$\begin{aligned} \frac{d\Delta}{dp^*} &= \Delta_1 \frac{dT}{dp^*} + \Delta_2 \\ &= [E_s(p^* - T) - E_s(p^* - T) + TE_s'(p^* - T)] \frac{dT}{dp^*} \\ &\quad + [E_s(p^*) - E_s(p^* - T) - TE_s'(p^* - T)] \\ &= \underbrace{TE_s'(p^* - T)}_+ \frac{dT}{dp^*} + \underbrace{[E_s(p^*) - E_s(p^* - T) - TE_s'(p^* - T)]}_{+/-} \end{aligned}$$

We know that $E_s'' \geq 0$ is a sufficient condition for $(d\Delta/dp^*) > 0$, since it makes the second term ≥ 0 . With $E_s'' < 0$, the second term is negative. However, we can still have $(d\Delta/dp^*) > 0$ as long as the first-term dominates the second. In other words, we only need the total on the right-hand side of the above expression to be > 0 as a necessary and sufficient condition for $(d\Delta/dp^*) > 0$. This is less restrictive than $E_s'' \geq 0$ which is a sufficient condition.

A.3. Export supply elasticities

The export supply elasticity can be expressed as $\epsilon_s = (p/E_s(p))E_s'(p)$. Twice differentiating $E_s(p)$ and requiring it to be non-negative, i.e., requiring, $E_s'' \geq 0$, in turn requires that $(\epsilon_s/p)[\epsilon_s - 1] + (\partial\epsilon_s/\partial p) \geq 0$, which finally can be expressed as: $(p/\epsilon_s)(\partial\epsilon_s/\partial p) \geq -[\epsilon_s - 1]$. Note that with constant export supply elasticities, this translates into the requirement that $\epsilon_s \geq 1$. For non-constant export supply elasticity, $E_s'' \geq 0$ requires that the elasticity of the elasticity of export supply not be too negative when $\epsilon_s \geq 1$ and that it be above a certain positive value, $1 - \epsilon_s$, when $\epsilon_s < 1$.

When is $\epsilon_s \geq 1$? The export supply elasticity can alternately be expressed as:

$$\epsilon_s = \frac{x}{x - c} \epsilon_x + \frac{c}{x - c} \epsilon_c,$$

where ϵ_x and ϵ_c denote absolute values of the elasticity of domestic output supply and demand for the exportable good. It is easy to see that $\epsilon_s \geq 1$ would hold with most reasonable values of the domestic supply and demand elasticities and ratios of consumption to production of this good. Indeed, for the converse to be true, one would need to have very low elasticities of domestic demand and supply of the exportable and very small ratios of domestic consumption relative to output.

A.4.

To conduct the simulation analysis, we make the following assumptions regarding supply and demand functions in the small economy: Total endowment of the export-specific capital in the economy is assumed to be twice that of the import-competing specific factor. The production functions of the two goods are assumed to be the same, so that, taking into account the endowment difference, we can write the supply functions of the exportable and import-competing goods, respectively, as $x_e = 2p_e$ and $x_m = p_m$. We also write the aggregate domestic demands as $A_e - p_e$ and $A_m - p_m$.

References

- Bagwell, K., Staiger, R., 1999. An economic theory of GATT. *American Economic Review*, March 89 (1), 215–248.
- Bernheim, D.B., Whinston, M.D., 1986. Menu auctions, resource allocation, and economic influence. *Quarterly Journal of Economics*, February 101 (1), 1–31.
- Bernheim, D.B., Peleg, B., Whinston, M.D., 1987. Coalition-proof Nash equilibria. *Journal of Economic Theory*, June 42 (1), 1–12.
- Bhagwati, J., 1990. Aggressive unilateralism. In: Bhagwati, J., Patrick, H. (Eds.), *Aggressive Unilateralism*. University of Michigan Press, Ann Arbor, MI.
- Bhagwati, J., Irwin, D., 1987. The return of the reciprotarians: US trade policy today. *World Economy* 10 (2), 109–130.
- Coates, D., Ludema, R., 1997. Unilateral Trade Liberalization as Leadership in International Trade, Working Paper Number 97-23, Georgetown, 1–29.
- Coates, D., Ludema, R., 2001. A theory of trade policy leadership. *Journal of Development Economics*, June 65 (1), 1–29.
- De Melo, J., Grether, J., Olarreaga, M., 2001. Who determines Mexican trade policy? *Journal of Development Economics*, April 64 (2).
- Grossman, G., Helpman, E., 1994. Protection for sale. *American Economic Review*, September 84 (2), 833–850.
- Grossman, G., Helpman, E., 1995. Trade wars and trade talks. *Journal of Political Economy*, August 103 (4), 675–708.
- Hillman, A., Moser, P., 1996. Trade liberalization as politically optimal exchange of market access. In: Canzoneri, P. et al. (Eds.), *The New Transatlantic Economy*. Cambridge Univ. Press, Cambridge, pp. 295–316.
- Irwin, D., Kroszner, R., 1997. Interests, Institutions and Ideology in the Republican Conversion to Trade Liberalization, 1934–1945, NBER Working Paper Number 6112.
- Johnson, H., 1953. Optimum tariffs and retaliation. *Review of Economic Studies* 21, 142–153.
- Kindleberger, C., 1975. The rise of free trade in Western Europe, 1820–1875. *Journal of Economic History*, 20–55.
- Kindleberger, C., 1977. *America in the World Economy*. Foreign Policy Association, New York.
- Krishna, P., Mitra, D., 2003. Reciprocated Unilateralism in Trade Policy: An Interest-Group Approach, NBER Working Paper 9631.
- Mayer, W., 1981. Theoretical considerations on negotiated tariff adjustments. *Oxford Economic Papers* 33, 135–143.
- Mayer, W., 1984. The political economy of tariff agreements. *Schriften des Vereins für Socialpolitik* 148, 423–437.
- Mitra, D., 1999. Endogenous lobby formation and endogenous protection: a long run model of trade policy determination. *American Economic Review*, December 89 (5), 1116–1134.
- Mitra, D., Thomakos, D., Ulubasoglu, M., 2002. Protection for sale in a developing country: democracy vs. dictatorship. *The Review of Economics and Statistics* 84 (3), 497–508.
- Rodrik, D., 1995. Political economy of trade policy. In: Grossman, G., Rogoff, K. (Eds.), *Handbook of International Economics*, vol. 3. North-Holland.