

Reciprocated unilateralism in trade reforms with majority voting

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

^a *John Hopkins University, United States*

^b *NBER, United States*

^c *Syracuse University, United States*

^d *IZA, Germany*

Received 26 September 2004; received in revised form 11 May 2006; accepted 30 May 2006

Abstract

This paper shows how unilateral liberalization in one country can increase the voting support for reciprocal reduction in trade barriers in a partner country. When trade policies are determined simultaneously in the two countries, we show the possibility of multiple political equilibria — one in which the countries are both protectionist and another in which they trade freely with each other. Starting with trade protection in both countries, a unilateral reform in one country is shown to bring about a free trade equilibrium that obtains majority support in both countries.

© 2006 Elsevier B.V. All rights reserved.

JEL classification: F13; F10; F02; O24

Keywords: Unilateralism; Reciprocity; Voting; Tariff; Liberalization

1. Introduction

Reciprocal tariff reductions in the context of trade negotiations have been extensively studied in the theoretical literature on international trade.¹ Recently, however, the literature has also begun studying the potential interdependence of trade policies across countries, specifically the role of unilateral (i.e., unconditional) liberalization in securing a reciprocal reduction in trade barriers by partners.²

* Corresponding author.

E-mail address: Pravin_Krishna@Jhu.edu (P. Krishna).

¹ See, for instance, Johnson (1953), Mayer (1981) and, more recently, Bagwell and Staiger (1999), among others.

² See Coates and Ludema (2001) and Krishna and Mitra (2005). See also Bhagwati (2002) for a general discussion.

In this paper, we explore the link between unilateralism and reciprocity in a context in which the decision to carry out a trade reform is determined by its popular political support. That is, trade policy changes are voted upon by the public and outcomes are determined by the majority (as, for instance, in Mayer, 1981 and Fernandez and Rodrik, 1991). We model a two-good, two-country trading world in which output in each country is produced by individuals with differing relative productivities in the two sectors (as in Mayer, 1998). In the home country, any proposed trade reforms pit (loosely speaking) individuals in the losing (import-competing) sector against those in the winning (exportable) sector but to varying extents (as workers vary in their relative productivities). In this setting, we demonstrate how unilateral trade liberalization by a trade partner may increase the voting support for trade liberalization in the home country. Specifically, a reduction in tariffs by a partner country that increases the world price of the exportable of the home country (and thus lowers the relative price of the importable) lowers the relative wage advantage from working in the home country's import-competing sector. Some workers in the import-competing sector prior to the reforms who would have previously opposed a move to free trade in the home economy now support this policy. With a large enough downward movement in the relative price of the importable good, the protected home economy may then gain majority support for free trade.

When trade policies are determined simultaneously in the two countries, we show the possibility of multiple political equilibria — one in which both countries are protectionist and another in which both freely trade with each other. Starting with trade protection in both countries, a unilateral reform in one country is thus shown to bring about a free trade equilibrium (a self-enforcing state) that is consistent with majority voting in both countries.

Interdependencies of the type discussed in this paper carry important normative implications. The policy of using unconditional liberalization to induce reciprocity by partners stands in contrast to conventional policy wisdom regarding the use (or the threat) of raising one's trade barriers to remove those of others. Understanding the channels that link trade policies across countries is important from a positive standpoint as well, as it may help us understand better particular episodes of reforms undertaken by countries. Specifically, we should note that the prediction of our model is consistent with a few major episodes of unilateral trade liberalization that are well known in the history of international economic relations. As Coates and Ludema (1997) argues, these include the unilateral repeal of England's Corn Laws in the mid-nineteenth 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 subsequent period leading up to the 1970s.

Perhaps closer in spirit to the theoretical framework and assumptions articulated in the paper is the more recent experience of developing countries in the world trading system: Following (chronologically) trade barrier reductions by full-obligation (i.e., developed country) GATT members in the several GATT rounds, and despite the exemption from the obligation to reciprocate afforded by the articles (specifically, Article 18) of the GATT, there was by the late 1980s a "rush to free trade" among countries in the developing world (see Rodrik, 1994). Unilateralism was thus reciprocated even in the absence of a formal

obligation to do so. We may also cite the specific example of Uruguay, whose trade reforms in early 1990s seem roughly consistent with the predictions of our model. Thus, for instance, Forteza et al. (2004) has described the liberalization in the early 1990s as having been driven by trade policy changes in Brazil which “altered the domestic equilibrium in Uruguay in favor of pro-export groups.” Thus, in understanding the reform experiences of developing countries, it seems important to consider interdependencies in trade policy of the sort that we model here.

Finally, a few points regarding the links between this present paper and our earlier work may be worth noting. Krishna and Mitra (2005), like the present paper, considers the question of whether unilateral trade liberalization in one country may induce reciprocity in partner countries *absent* any trade negotiations.³ In a setting where organized interest groups influence trade policy, it argues that unilateral trade liberalization in one country may impact policies in partner countries by encouraging the formation (or increasing the relative strength) of the relevant interest groups there. The key difference between our earlier work and the present analysis is the institutional setting in which policy is determined. While interest groups influence policy in our earlier analysis, policy is determined by majority voting in this paper.⁴ This is not a minor difference, since the trade policy predictions that are obtained in the two settings generally differ widely from each other. The finding that unilateral reforms by one country may, regardless of the institutional setting, have similar (positive) effects on the incentives for reforms in partner countries is therefore significant.

The rest of the paper proceeds as follows. In Section 2, we develop a simple majority voting framework in which we demonstrate the mechanism of reciprocated unilateralism. Section 3 considers policy interdependence between large countries and demonstrates the interesting possibility of multiple policy equilibria. Sections 4 and 5 develop the analysis with tariff revenue redistribution and with endogenous tariffs — demonstrating the robustness of the results in both cases. Section 6 concludes.

2. Trade policy with majority voting

Consider a small economy with two sectors, M (import-competing) and E (exportable). We assume that both goods in this economy are produced under constant returns to scale using labor alone. However, different individuals have different levels of productivities in the production of the two goods. Thus, we denote by $h^M(i)$ the labor productivity of individual i in sector M and by $h^E(i)$ her productivity in sector E . Let p^* be the world relative price of good M . Thus, its domestic price is $p = p^*(1+t)$ where t is the ad valorem import tariff, which takes the value \bar{t} prior to the trade reform and zero once the reform takes place.

A person works in the sector that pays her a higher wage determined by her productivity. She decides to work in sector E if $h^E(i) > p h^M(i)$, i.e., if $h^E(i)/h^M(i) > p$. Thus, her comparative advantage in the production of the export good is $h^E(i)/h^M(i)$, which needs to be greater than the relative price p of the import-competing good for her to decide to work in the export sector. Let us

³ See also Coates and Ludema (2001) which argues that in the presence of “political risk” of domestic opposition to trade agreements, unilateral tariff reduction – by lowering the political stakes associated with trade liberalization in the foreign country – may increase the likelihood of a successful outcome in a trade negotiation.

⁴ Moreover, while in Krishna and Mitra (2005) the political economy structure and policy endogenously respond to exogenous changes in the partner country, the model here is fully closed in the sense that policies in both countries are completely endogenous and determined in equilibrium.

rank individuals in decreasing order of their comparative advantage in E production. This comparative advantage denoted by

$$R(n) = h^E(n)/h^M(n) \tag{1}$$

is therefore decreasing in n . Henceforth, we use i to represent individuals in general and use n when we have in mind their ordering according to comparative advantage given by Eq. (1).

Let there be a continuum of individuals in the economy and let their total mass or measure be normalized to unity. In equilibrium, the marginal worker will be indifferent between working in the export and import sectors. Thus, the equilibrium mass of individuals n^* working in the export sector is the solution to the equation

$$R(n) = p \tag{2}$$

and so the equilibrium mass working in the other sector is $1 - n^*$. Fig. 1 illustrates.

Let us assume that individuals have identical Cobb–Douglas preferences, so that each individual has an indirect utility function given by

$$V(p, I) = v(p)I = I/p^\gamma, \tag{3}$$

where γ is the exponent on the consumption of the importable in the Cobb–Douglas utility function.

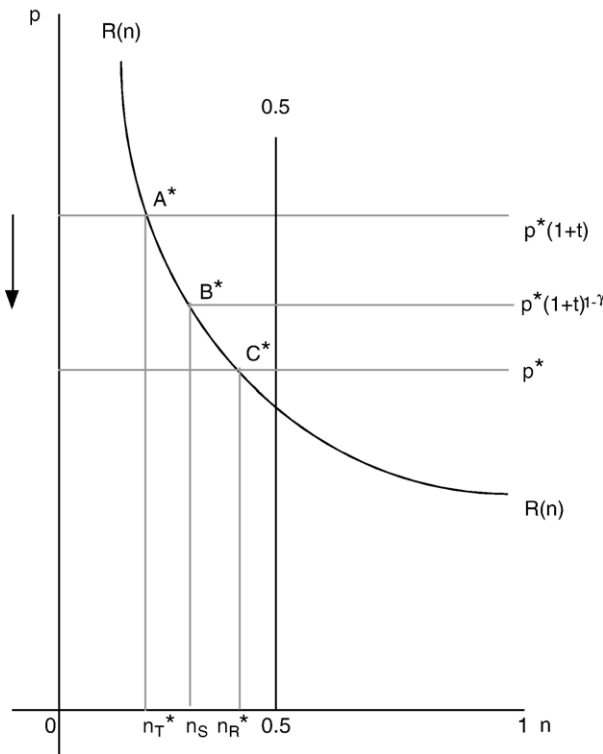


Fig. 1. The political support for a trade reform.

Ignoring, for now, the issue of tariff revenues and how they are distributed across the population (we return to this in Section 4), it can be shown that individuals in the E sector prior to the reforms unambiguously benefit from these reforms. This is seen from the following inequality:

$$[p^*(1 + \bar{t})]^{-\gamma} h^E(i) < p^{*-\gamma} h^E(i), \quad (4)$$

where the left-hand side is the pre-reform utility and the right-hand side is the post-reform utility. Thus, all individuals who remain in the E sector prior to the reforms support reforms.

We compare next the pre- and post-reform utility levels of those individuals who were originally in the M sector and remain there in the post-reform equilibrium. As can be seen from inequality Eq. (5) below, all of them are worse off since the pre-reform utility of such an individual (appearing on the left-hand side of Eq. (5)) is clearly less than the post-reform level (expressed on the right-hand side),

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(i) > p^{*1-\gamma} h^M(i). \quad (5)$$

Finally, we look at the individuals who were in sector M prior to the reforms but are in sector E in the post-reform equilibrium. In other words, they end up moving from M to E , which is the relatively lucrative sector for them after the reforms. Note that given the post-reform relative prices, E might be relatively lucrative but some of those who moved may be worse off relative to their pre-reform situation (in which the domestic relative price was different). Prior to the reform, the utility of such an individual was $[p^*(1 + \bar{t})]^{1-\gamma} h^M(i)$ and after the reform, her utility is $p^{*-\gamma} h^E(i)$. It is easy to show that the ranking of the two states is not the same for all individuals who moved at the implementation of reforms. All we know is that for all the people who are in sector E following the reforms, we have

$$p^{*-\gamma} h^E(i) \geq p^{*1-\gamma} h^M(i), \quad (6)$$

that is, post-reform, they are better off in sector E than they would have been in sector M . However, it is possible to have

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(i) > p^{*-\gamma} h^E(i) \geq p^{*1-\gamma} h^M(i) \quad (7)$$

for some of these individuals. Thus, in order to calculate how many people support the reforms we need to solve the equation

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(n) = p^{*-\gamma} h^E(n), \quad (8)$$

which in turn is

$$p^*(1 + \bar{t})^{1-\gamma} = R(n). \quad (9)$$

We denote the solution to this equation by n_s , the number of people supporting the reforms.⁵

⁵ Let n_R^* and n_E^* be the proportion of the population working in the export sector in the reformed and in the tariff-ridden states of the economy respectively. Then, all the n_E^* people that originally were and remain in sector E support the reforms. In addition, $(n_s - n_E^*)$ of the $(n_R^* - n_E^*)$ people moving to E after the reforms also support the reforms.

Next, we see how this support for reforms responds to the world relative price of imports and to the size of the original tariffs. It is easy to see by differentiating the above equation that

$$\frac{\partial n_s}{\partial p^*} = \frac{(1 + \bar{t})^{1-\gamma}}{R(n)} < 0 \text{ and } \frac{\partial n_s}{\partial \bar{t}} = \frac{p^*(1 - \gamma)(1 + \bar{t})^{-\gamma}}{R(n)} < 0. \quad (10)$$

In other words, the support for the reform is decreasing in the world relative price of imports as well as the initial tariff. And so a trade reform takes place when the world price is below a certain threshold. Since, with majority voting, more than half (i.e., $n=0.5$) the voters need to support the reform, this threshold world price is the one that solves the following equation:

$$p^*(1 + \bar{t})^{1-\gamma} = R(0.5) \quad (11)$$

With the aid of Fig. 1, we try to illustrate the political support for reforms. Domestic voters, indexed by n , are represented on the x-axis while prices are represented on the y-axis. $R(n) = h^E(n)/h^M(n)$ is the downward sloping curve indicating the relative productivity of workers in the exportable sector. The pre-reform domestic relative price of the importable initially is given by $p^*(1 + t)$ and the initial equilibrium is represented by A^* , with workers to the left of A^* allocated to the exportable sector and the rest to the import-competing sector. The post-reform domestic relative price is given by p^* and the post-reform equilibrium is represented by C^* . In other words, after the reform workers to the left of C^* are allocated to the exportable sector and the rest to the import competing sector. As argued above, workers to the left of A^* (i.e., the workers who are always in the export sector, both pre- and post-reform) will always support the reform because for them the reforms just mean a pure terms of trade gain. Workers to the right of C^* (i.e., the workers who are always in the import-competing sector, both pre- and post-reform) will always oppose the reform because for them the reforms are a pure terms of trade loss. The workers in between A^* and C^* (i.e., the workers who were in the import-competing sector prior to the reform but work in export sector after the reform) will be split in their support for the reforms. Everyone to the left of B^* supports the reform and everyone to the right of it is against it. The downward arrow in the figure shows the point of political support for the reform corresponding to the initial (pre-reform) equilibrium. Clearly, the supporters of the reform include people who always work in the export sector and some of the people who, after the reforms, move from the import-competing sector to the export sector. These are the movers who have a greater comparative advantage in producing the export good than the other movers, and therefore find their post-reform position in the export sector relatively more attractive than their pre-reform position in the import-competing sector.

It follows that, with trade policy determined by majority voting, a small country may liberalize its own trade regime in response to the unilateral liberalization of trade undertaken by a large partner country. Fig. 2 illustrates the effects of tariff reductions by a large partner country and an improvement of the world terms of trade in favor of the small home country. The world relative price of the importable goes down as a result from p^* to p' . A^* , B^* and C^* change to A' , B' and C' respectively. In other words, the labor allocation to the export sector and therefore output in that sector increase both pre- and post-reform. The support for the reform also increases. Both the world terms of trade and the domestic terms of trade have shifted in favor of the home country's export sector, which makes

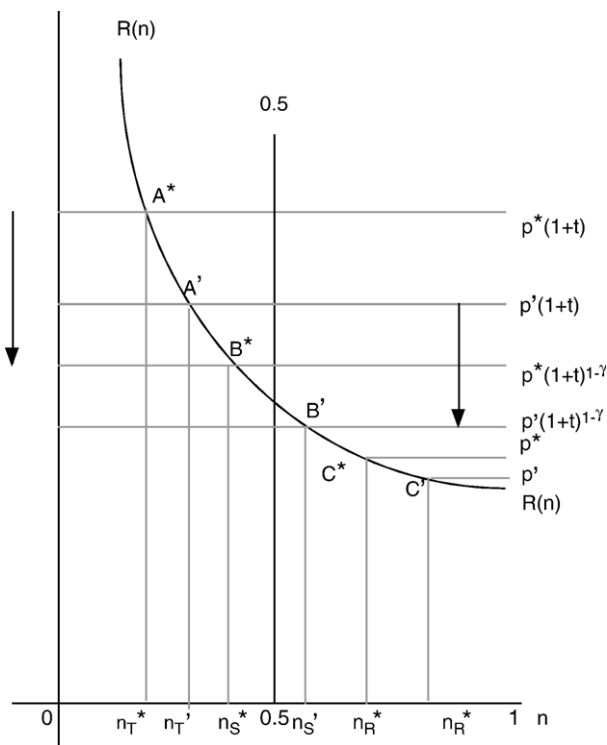


Fig. 2. Comparative statistics: the effect of a change in the world price on the political support for a trade reform.

working in this sector relatively more attractive, which also increases the support for the reform. Liberalization in the partner country, then, can increase support for the lowering of trade barriers from below 50% (at B^*) to above 50% (at B'). Thus reforms in the partner country lead to reforms at home.⁶

3. Large countries: multiple trade policy equilibria

We consider next the case of two large open economies trading with each other. The home country's exportable and importable are E and M , respectively, while it is the reverse for the foreign country. In this case, the world relative price of the importable will be a function of the tariffs of the two countries. If the domestic and foreign tariffs are t and t^* respectively, we have that

$$p^* = p^*(t, t^*) \text{ where } p_1^* < 0, p_2^* > 0, \tag{12}$$

with p_1^* and p_2^* denoting partial derivatives of p^* with respect to its first and second arguments respectively.

⁶ Our theoretical result regarding reciprocal reforms at home clearly depends on changes in the terms of trade that come about due to the initial reforms in the partner country. In an interesting study investigating (somewhat analogously) the impact of terms of trade changes on domestic policy, [Hanson and Spilimbergo \(2001\)](#) finds that positive price shocks to sectors in the United States that use “undocumented labor” intensively result in reductions of border enforcement preventing illegal immigration.

In this case (with \bar{t} again representing the pre-reform home tariff), the support for the reform at home is the solution to the equation

$$[p^*(\bar{t}, t^*)(1 + \bar{t})]^{1-\gamma} h^M(n) = p^*(0, t^*)^{-\gamma} h^E(n), \tag{13}$$

which in turn can be written as

$$\Omega(\bar{t}, t^*) = R(n), \tag{14}$$

where $\Omega(\bar{t}, t^*) = [p^*(\bar{t}, t^*)]^{1-\gamma} [p^*(0, t^*)]^\gamma [1 + \bar{t}]^{1-\gamma}$. It is easy to see that $\Omega_2 > 0$ as $p_2^* > 0$. If we rule out the paradoxical possibility that the domestic price of the importable may fall with an increase in home tariff, we also have $\Omega_1 > 0$. Thus we can state that

$$\frac{\partial n_s}{\partial t^*} = \frac{\Omega_2}{R(n)} < 0 \text{ and } \frac{\partial n_s}{\partial \bar{t}} = \frac{\Omega_1}{R(n)} < 0 \tag{15}$$

In this case, again, a trade reform in the partner country raises support for reforms in the home country. Again there is a negative relationship between initial home tariff and the support for reform.

The preceding analysis suggests that the economy may exhibit multiple trade policy equilibria. Majorities in the two countries may both support protection or both support free trade. This follows directly from the preceding discussion and is illustrated in Fig. 3, where we draw the home tariff as a function of the foreign tariff. If the foreign tariff is very high, there is insufficient support at home for reform and the initial tariff persists. For a foreign tariff below a critical level (given by the solution to the equation $\Omega(\bar{t}, t^*) = R(0.5)$), there is majority support for the reform and the tariff drops to zero. Thus, R (Home) is the home country’s reaction function. The foreign

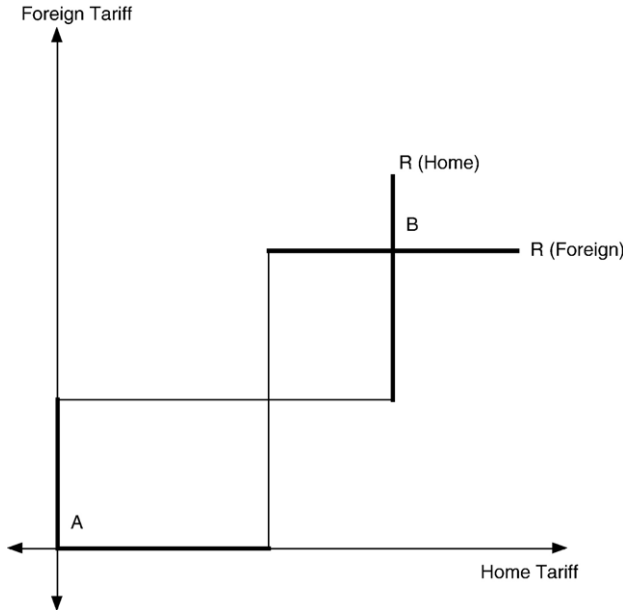


Fig. 3. Multiple Nash equilibria with two large countries.

country’s reaction function R (Foreign) conveys the same idea. Fig. 3 shows the possibility of multiple equilibria — either both countries liberalize or both countries remain at their respective initial tariffs. Interestingly, a reform forced on either of these countries (either by a dictatorial leader or a multilateral agency such as the IMF or the World Bank) *against* the will of the majority can result in a popularly supported reciprocal reform in the partner country, which can create popular political support for trade liberalization in the country in which trade reform was imposed.

The intuition underlying the preceding results may be summarized as follows: the popular support for a tariff is decreasing in the world relative price of a country’s importable good, which in turn is an increasing function of its partner country’s import tariff. Thus, protectionism in the home country undermines support for reform in the partner country, which, in turn, discourages support for reform in the home country. Similarly, when there is no tariff in the home country, the relative price of the importable of the partner country is low and, therefore, the support for reforms increases. This, in turn, results in strong support for reforms in the home country as well.

Two final points about the magnitude of external tariffs are worth emphasizing here. For the case analyzed in Fig. 3, in order to induce a reciprocal tariff reduction by the partner country, the home country’s initial tariff reduction has to be large enough. Second, small changes in policy around either equilibrium bring the system back to the equilibrium point (as also implied by Fig. 3). Thus, once the free trade equilibrium has been achieved in both countries, it is a relatively stable outcome. Removal of external pressures for free trade (from say, multilateral organizations, as we have suggested above) will not easily cause these countries to revert to the equilibrium with tariffs.

4. Tariff revenue redistribution

Considering the issue of tariff revenue redistribution does not substantively alter the results. Consider again the case of a small open economy (as modeled in Section 2). As before, we assume that individuals have identical Cobb–Douglas preferences, so that each individual has an indirect utility function given by

$$V(p, I) = v(p)I = I/p^\gamma, 0 \leq \gamma \leq 1, \tag{16}$$

where I is the individual’s income. Let $\mathcal{T}(\bar{t}, p^*)$ denote tariff revenue as a proportion of national income (=national factor income plus total tariff revenue). Since tariff revenue is now redistributed in proportion to factor income, individual i ’s income prior to the reform now is given by $h^E(i)[1 - \mathcal{T}(\bar{t}, p^*)]^{-1}$ when she works in the export sector and $ph^M(i)[1 - \mathcal{T}(\bar{t}, p^*)]^{-1}$ if she works in the import-competing sector. Since there is no tariff revenue after reforms, the post-reform incomes are the same as those in the original model. With tariff revenues distributed in proportion to factor incomes, an individual who was originally in the export sector (prior to reforms) will benefit from these reforms if the utility of such an individual prior to these reforms is less than post-reform utility:

$$[p^*(1 + \bar{t})]^{-\gamma} h^E(i) [1 - \mathcal{T}(\bar{t}, p^*)]^{-1} < p^{*-\gamma} h^E(i), \tag{17}$$

which holds when $(1 + \bar{t})^{-\gamma} [1 - \mathcal{T}(\bar{t}, p^*)]^{-1} < 1$, which in turn always holds, for all \bar{t} , if $\gamma = 1$, i.e., when everyone consumes only good M . At the other extreme, when $\gamma = 0$, i.e., when everyone consumes only good E , the inequality is reversed. For an intermediate γ , the inequality will hold for a high enough tariff. For instance, it holds when \bar{t} equals the prohibitive tariff since at

that tariff $\Upsilon=0$. However, the minimum tariff at which this inequality will start holding is much lower than the prohibitive tariff. Thus, we assume that the values of γ and \bar{t} are such that the inequality holds and so all individuals who remain in the E sector prior to the reforms support reforms.

Next we look at all those individuals who were originally in the M sector and remain there in the post-reform equilibrium. All of them are worse off since the pre-reform utility of such an individual is greater than the post-reform level, as can be seen from the following inequality:

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(i) [1 - \Upsilon(\bar{t}, p^*)]^{-1} > p^{*1-\gamma} h^M(i) \tag{18}$$

which always holds as it is always true that $(1 + \bar{t})^{1-\gamma} [1 - \Upsilon(\bar{t}, p^*)]^{-1} > 1$.

Finally, we look at the individuals who were in sector M prior to the reforms but are in sector E in the post-reform equilibrium. Note that, given the post-reform relative prices, E might be relatively lucrative but some of these people may be worse off relative to their pre-reform situation (when the domestic relative price was higher). Prior to the reform, the utility of such an individual was $[p^*(1 + \bar{t})]^{1-\gamma} h^M(i) [1 - \Upsilon(\bar{t}, p^*)]^{-1}$, and after the reform, her utility is $p^{*-\gamma} h^E(i)$. The ranking of the two states is not the same for all individuals who moved with the implementation of reforms. All we know is that for all the people who are in sector E following the reforms, we have

$$p^{*-\gamma} h^E(i) \geq p^{*1-\gamma} h^M(i). \tag{19}$$

However, it is possible to have

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(i) [1 - \Upsilon(\bar{t}, p^*)]^{-1} > p^{*-\gamma} h^E(i) \geq p^{*1-\gamma} h^M(i) \tag{20}$$

for some of these individuals. Thus, in order to calculate how many people support the reforms we need to solve the equation

$$[p^*(1 + \bar{t})]^{1-\gamma} h^M(n) [1 - \Upsilon(\bar{t}, p^*)]^{-1} = p^{*-\gamma} h^E(n) \tag{21}$$

which in turn may be written as

$$p^*(1 + \bar{t})^{1-\gamma} [1 - \Upsilon(\bar{t}, p^*)]^{-1} = R(n). \tag{22}$$

As before, we denote the solution to this equation by n_s , the number of people supporting the reforms.

Next, we see how this support for reforms responds to the world relative price of imports and to the size of the original tariffs. By differentiating the above equation with respect to p^* , we get

$$\frac{\partial n_s}{\partial p^*} = \frac{(1 + \bar{t})^{1-\gamma} [1 - \Upsilon(\bar{t}, p^*)]^{-1} + p^*(1 + \bar{t})^{1-\gamma} [1 - \Upsilon(\bar{t}, p^*)]^{-2} \Upsilon_2}{R(n)} \tag{23}$$

It is easily shown that $\frac{\partial n_s}{\partial p^*} < 0$ if the elasticity of the tariff revenue share with respect to p^* , i.e., $\varepsilon_{\Upsilon, p^*} = \frac{p^* \Upsilon_2}{\Upsilon} > \frac{-(1-\Upsilon)}{\Upsilon}$.⁷ (Here, γ_2 represents the partial derivative of γ with respect to p^* .) The

⁷ We should note that it is a restriction that is quite easily met in practice. To see this, suppose imports (evaluated exclusive of tariffs) are 5% of national income. Also, suppose the ad valorem tariff rate is 20%. In that case, $\Upsilon=0.01$ and $\frac{-(1-\Upsilon)}{\Upsilon} = -99$. In this example, for the above derivative to be negative, all we are saying is that if the elasticity $\varepsilon_{\Upsilon, p^*}$ is negative, it should not be more negative than -99. In other words, the reduction in tariff revenue as a proportion of national income as a result of a 1% rise in the world price of the importable should not exceed 99%.

support for the reform is then decreasing in the world relative price of imports. And so a trade reform takes place when the world price is below a certain threshold price. The threshold world price at which the majority starts supporting reforms is the one that solves the following equation:

$$p^*(1 + \bar{t})^{1-\gamma} [1 - \mathcal{T}(\bar{t}, p^*)]^{-1} = R(0.5) \tag{24}$$

since n_s decreases with p^* for a given \bar{t} , a small enough p^* can make n_s a majority (i.e., $n_s > 0.5$).

We have also considered the case of two large open economies trading with each other allowing for uniform tariff revenue redistribution in both. Under the same condition that $\varepsilon_{\mathcal{T}, p^*} = \frac{p^* \mathcal{T}_2}{\mathcal{T}} > \frac{-(1-\mathcal{T})}{\mathcal{T}}$, it is straightforward to show that $\frac{\partial n_s}{\partial t^*} < 0$. Trade reform in the partner country raises support for reforms in the home country. We therefore obtain the same type of reaction functions and multiple equilibria as in the main model.

5. Endogenous tariffs

So far, the pre-reform tariff \bar{t} has been exogenously (and arbitrarily) specified. In this section, we allow for endogenous determination of the tariff. As before, we develop the analysis without tariff revenue considerations and subsequently analyze the case with tariff revenue redistribution formally modeled.

Consider again the small country case. In the absence of tariff revenue redistribution, since individual utilities are monotonic in tariffs (given sector of employment), we assume (in order to be able to always derive a finite most preferred tariff for the median voter) that there are upper limits on the tariff that can be chosen in equilibrium. In other words, $t \in [0, t^{\max}]$, where t^{\max} is the maximum permissible tariff, which, say, is the prohibitive tariff (that leads to autarky). If p^* is low, the median individual (in terms of comparative advantage) always lies in sector E and her most preferred tariff is zero, while with high p^* , the median individual always produces M and so her most preferred tariff is t^{\max} . Note that the median individual, in such cases, never prefers an interior value of the tariff to both extremes because her utility is monotonic in the tariff.

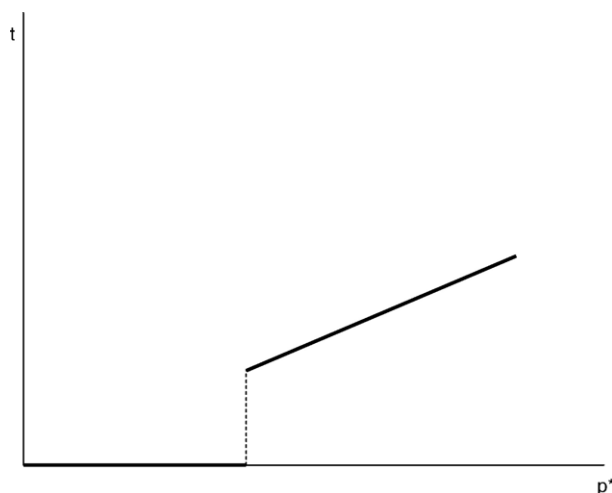


Fig. 4. The tariff as a function of the world relative price of the importable.

Next, we see what happens for intermediate values of p^* . In such cases, for low values of the tariff, the median individual works in the E sector and her utility is decreasing in the tariff. However, at a high enough tariff, she switches sectors and from then on her utility is increasing in the tariff. Since we have a continuum of individuals and we assume that $R(n)$ is continuous in n , the median voter's utility in this intermediate p^* case is a V-shaped function of the tariff and thus she (the median voter) again chooses one of the extreme values. A reduction in p^* will increase her utility under zero tariff and will reduce her utility when the tariff is t^{\max} . Thus, a lower world price always makes it more likely that the median voter will choose the zero tariff.

When we extend the analysis with endogenous tariffs to the case of two large countries, multiple trade policy equilibria emerge as a possibility again. Median voters in both countries choose a zero tariff (autarky) or they choose their maximum permissible tariff.

We are also able to endogenize the tariff when tariff revenues are redistributed in proportion to factor incomes. In the case of a small country, placing standard restrictions that result in the concavity of the median voter's objective function and imposing the earlier restriction that $\varepsilon_{T,p^*} = \frac{p^* \gamma_2}{T} > \frac{-(1-\gamma)}{T}$, we have free trade below a cut-off value of p^* , with the equilibrium tariff jumping to a positive value at the cut-off value (and thereafter increasing or decreasing in p^*). One possible case is shown in Fig. 4. If a small country is trading with a large partner, a large enough reduction in this partner's tariff will lead to a large enough decrease in p^* leading, in turn, to a drop to a zero tariff (free trade). This analysis easily extends to the case with two large countries.

6. Conclusions

Can unilateral trade liberalization by one country lead to reciprocal liberalization by its partner in the absence of negotiations? In this paper, we explore this causal linkage between unilateralism and reciprocity in the context of a model in which the decision to carry out a trade reform is determined by its popular political support. In this framework, trade policy changes are voted upon by the public and outcomes are determined by the majority. We demonstrate that unilateral trade liberalization by a trading partner increases the voting support for trade liberalization in the home country. More specifically, if the home country reduces its tariff, the world price of the importable of the partner country will go down and the support for a trade reform in the partner country will go up. When trade policies are determined simultaneously in the two countries, we show the possibility of multiple political equilibria — one in which both countries are protectionist and another in which they trade freely with each other.

Acknowledgements

We are grateful to the editor, Gordon Hanson, and two anonymous referees for many helpful comments and suggestions. For helpful discussions, we are also grateful to seminar audiences at Boston College, Brandeis University, University of British Columbia, Brown University, University of California at Irvine, Columbia University, University of Connecticut, Dartmouth College, Florida International University, New York University, University of Notre Dame, Syracuse University, Yale University and the 2002 meetings of the American Economic Association.

References

- Bagwell, K., Staiger, R., 1999. An economic theory of GATT. *American Economic Review* 89, 215–248.
- Bhagwati, J., 2002. The unilateral freeing of trade versus reciprocity. In: Bhagwati (Ed.), *Going Alone: The Case for Relaxed Reciprocity in Freeing Trade*. MIT Press.

- Coates, D., Ludema, R., 1997. Unilateral Trade Liberalization as Leadership in International Trade, Working Paper, Number 97–23, Georgetown University.
- Coates, D., Ludema, R., 2001. A theory of trade policy leadership. *Journal of Development Economics* 65 (1), 1–29.
- Fernandez, R., Rodrik, D., 1991. Resistance to reform: status-quo bias in the presence of individual specific uncertainty. *American Economic Review* 81 (5), 1146–1155.
- Forteza, A., Buquet D., Ibarburu, M., Lanzaro, J., Pereyral, A., Siandra, E., Vaillant, M., 2004. Understanding Reform: The Uruguayan Case, Mimeo, Universidad de la Republica, Uruguay.
- Hanson, G., Spilimbergo, A., 2001. Political economy, sectoral shocks, and border enforcement. *Canadian Journal of Economics* 34, 612–638.
- Johnson, H., 1953. Optimum tariffs and retaliation. *Review of Economic Studies* 21, 142–153.
- Krishna, P., Mitra, D., 2005. Reciprocated unilateralism in trade policy. *Journal of International Economics* 65 (2), 461–487.
- Mayer, W., 1981. Theoretical considerations on negotiated tariff adjustments. *Oxford Economic Papers* 33, 135–143.
- Mayer, W., 1998. Endogenous corrections of economic policies under majority voting. *Finanzarchiv* 55 (1), 41–58.
- Rodrik, D., 1994. The rush to free trade. Why so late? Why now? Will it last? In: Haggard, S., Webb, S.B. (Eds.), *Voting For Reform: Democracy, Political Liberalization, and Economic Adjustment*. Oxford University Press, New York.