How and when a unilateral trade reform could be a political equilibrium

Marcel Vaillant

January 2000

Abstract

In the paper the endogenous trade model follows the Grosman and Helpman (1994 y 1995) tradition. The structure of the economy is characterised by a specific factor trade model and consumers' preferences are quasilinears. Owners of specific factors all are organised in lobby groups and the ownership are very concentrated.The available options to the government are mantain the trade policy status quo or implement an opening trade reform. Lobbys group influence this discretional government with income contribution taking into account its own objective function. The equilibrium of the game is studied in two differents situations: without exceptions in the trade liberalisation; with the presence of sector exception list. It is shown that a commercial opening that is not a political equilibrium (it is not incentives compatible) when the government wants to make it in general, however can be so if the government is able to isolate certain sectors from the international competition, through long periods of adjustment (given by gradual policies or the existence of exceptions list).

1 Introduction

The literature on endogenous trade policy is oriented to analyse how a certain pattern of protection could be explained by a model of interaction between the private sector and the government. The main objective is to explain the particular level that the tariff rate will have in a game equilibrium given the basic parameters of the model (preferences, technology, property of the production factors). In reality thinks are different, there are many restrictions (institutional, informational, etc) that imply that this kind of model do not work very well.

The government's decision that is relevant to endogenise is the one about if the trade reform is made or not. In fact, in many developing countries the interest question to answer is how and when a unilateral reform could be a political equilibrium. It is realistic to think of this problem as a binary choice. This problem is different from the one that has generally been studied in the literature on endogenous trade policy. This perspective seems more realistic as long as the necessary requirements of information to achieve a fine tuned definition of the tariff structure as the output of a political equilibrium seem to be hardly completed in reality. On the other hand the historical observation of the process allows to conclude that the decision on the trade policy was always centered on the decision whether to open the economy unilaterally or not.

In this sense, it is useful the Grossman and Helpman's model (1995) in which they analyse the decision of being part of a free trade agreement considering two options: to make the agreement or not to make it. The authors endogenise the decision within a model of political contribution. This model seems specially pertinent to the case of the unilateral trade liberalisation. A government has to decide if it plays unilateral trade opening or not. It is shown that a commercial opening that is not a political equilibrium (it is not incentives compatible) when the government wants to make it in general, however can be so if the government is able to isolate certain sectors from the international competition, through long periods of adjustment (given by gradual policies or the existence of exceptions list). These two characteristics seem to have been present in a notorious way in many developing countries.

The topic of the administrative protection in the context of a model of political economy with contributions admits at least two approaches. The first one consists on being able to explain why certain types of instruments are preferred to give protection in relation to others. In this sense, see for example the article of Maggi and Rodriguez-Clare (1998). A different perspective, is not to analyse the decision on the particular instruments itself but the decision to isolate (to except) certain sectors from the effects of the commercial opening using the discretionary government's power. This second perspective will be the one adopted in this chapter. In the case of many developing countries is verified that the trade reform was characterised to isolate (using certain instruments that were changing along the process) to a group of sectors (relatively stable along the trade reform) of the liberalisation. The relevant phenomenon to explain is the fact that the trade reform implied liberalisation but also isolation with granted protection to a subset of sectors.

The paper is organised in three more sections. In the second one the srtucture of the economy and the contribution game is presented. The third section is about the equilibrium outcome in two basic environments: without exception in the trade reform (benchmark case); with exceptions. Finally, the last section develop a brief history of the trade reform in a particular country (Uruguay) using the theoretical results of the previous model.

2 Basic assumptions: structure of the economy and the contribution game

The economy is supposed to have individuals with identical preferences, that are only different in their factors endowments. Consumers preferences are quasi-linear and can be represented by the following utility function:

$$u^h = c_0^h + \sum_i u_i(c_i^h) \tag{1}$$

where: $h = 1, ..., H$- consumers index; functions u_i have the usual properties (increasing and concave functions); c_z- consumption of good z, with $z = 0, i$ and $i = 1, .., I$..

Consumers want to maximise equation (1) subject to their budget constraint:

$$y^h \geq c_0^h + \sum_i p_i.c_i^h \tag{2}$$

where: y^h- income of consumer i; p_i- price of good i. The price of the good 0 is taken as numeraire. The indirect utility function is represented by:

$$\omega(p, y^h) = y^h + cs(p) \tag{3}$$

where: $ci(p) = \sum_i u_i(d_i(p_i)) - \sum_i p_i.d_i(p_i)$, is the consumer surplus.of the sum of sector $i = 1$ to $i = I$.

The general economic production framework is specified as in a specific factor trade model. There exist $I+1$ sectors in the economy: one sector (labelled with a sub index 0) that only uses the mobile factor labour; an others sectors (labelled with a sub index i) that uses a specific factor (v_i) and also the mobile factor. The specific factors are not mobiles between sectors and are fixed in a given amount. Thus, the assignment decisions is made only in the labour factor.

The supply side of the economy is characterised by those $I + 1$ constant returns to scale sectors:

$$x_0 = L_0 \tag{4}$$

$$x_i = F^i(L_i, v_i) \tag{5}$$

where: L_z- is the amount of mobile factor in the z sector (with $z = 0, i$); v_i- is the amount of specific factor in sector i (with $i = 1, .., I$) ; x_z - is the quantity produced by sector z.

It is assumed that in equilibrium x_0 is greater than zero. As p_0 is equal to one, then the mobile factor price will also be one (assuming a competitive framework). The profits' functions in the specific factor sectors are:

$$\pi^i(p_i) = \left\{ \max_{x_i} (p_i.x_i - L_i) : F^i(L_i, v_i) = x_i \right\} \tag{6}$$

$$\pi^i_{p_i} = x_i(p_i)$$

Where the subscript indicates a derivative and $x_s(p_s)$- is the supply function of good i.

The economy is small so the international prices are given. The trade policy is a set of instruments that can affect in a direct way the domestic prices of export and import goods, as shown in the following equation:

$$p_i = p_i^* + \tau_i \tag{7}$$

Where: p_i^*- is the international price of good i; τ_i- is a tax or a subsidy.

The trade functions are:

$$m_i = H.d_i(p_i) - x_i(p_i) \tag{8}$$

The tariff revenue is defined in per capita terms as follows:

$$\tau(p) = \sum_i (p_i - p_i^*). \left\{ d_i(p_i) - \frac{x_i(p_i)}{H} \right\} \tag{9}$$

Where:τ- tariff income.

The tariff revenue is given as a lump sum to the consumers. As each consumer has a different factor production endowment they have different levels of income. This specification of the model does not allow for a consumer having overlapping ownership of different specific factors. Each consumer is provided with a labour endowment of one unit, thus the population is equal to the supply of labour ($H = L$).

$$\overline{y}^h = 1 + sh_i^h.\pi^i(p_i) + \tau(p) \tag{10}$$

Where: $\overline{y}^h$- gross income consumer i; $sh_i^h = \frac{v_i^h}{v_i}$- is the participation that consumer h has in the ownership of specific factor i.

The disposable income is used in the consumer's budget constraint (2) it is the gross income net of the contributions that each consumer does to participate in the lobby.

$$y^h = \overline{y}^h - c^h(p) \tag{11}$$

where: $c^h(p)$-consumer h's contribution to the political game.

In this model consumers can be organised in groups as a way to influence on the government's actions. This will occur if they perceive that organising is beneficial for them. Only those consumers who are organised in lobbies do political contributions. The indirect utility function of this kind of consumers can be written in the following way:

$$\omega(p, y^h) = \omega^h(p) = \overline{\omega}^h(p) - c^h(p) = 1 + sh_i^h.\pi^i(p_i) + \tau(p) + ci(p) - c^h(p) \tag{12}$$

The natural members of a lobby group are the owners of a specific factor and they have the same interest related with the domestic prices and the trade policy. The lobby's objective function is the aggregate welfare of the members of the group, as it is shown in the following equation:

$$\begin{aligned} \Omega_i(p) \quad = \quad & \sum_{h \in \mathcal{H}^i} \omega^h(p) = \sum_{h \in \mathcal{H}^i} \overline{\omega}^h(p) - \sum_{h \in \mathcal{H}^i} c^h(p) = \overline{\Omega}_i(p) - C_i(p) = \\ & H\theta_i.(1 + \tau(p) + ci(p)) + \pi^i(p_i) - C_i(p) \end{aligned} \tag{13}$$

where: $\mathcal{H}^i$- is the subset of consumers owners of the specific factor i;.$\theta_i = \frac{H_i}{H}$.

Each owner of an specific factor is organised in a lobby group (Vaillant 1998, proposition 11) and it is assumed that specific factor ownership is so concentrated (θ_i is near to zero for all i), then the lobby's objective function comes from the following relationship:

$$\Omega_i(p) = \pi_i(p) - C_i(p) \tag{14}$$

Where: π_i- profit function sector i; C_i- contributions from sector i.

The government has an objective function with two components: in the first term, it is interested in receiving direct contributions that allow him to keep himself in the power; in the second term, the government is benevolent in the sense that it maximises the aggregate well-being of all the consumers (owners and not owners).The objective function of the government is the standard one already presented in previous papers [1]:

[1] A political objective function of this type depending in contribution and the well being of voters is consistent with the model of electoral competition (see Helpman, 1995). Grossman and Helpman (1994b) have shown that it emerges in a political system in which special interests design influence-driven contributions , and two parties compete for seats in parliament.

$$G = aW + C \tag{15}$$

Where: $C = \sum_i C_i$; $W = \sum_h \overline{\omega}^h(p)$aggregated welfare (gross from contributions).

Note that the aggregated welfare could be expresed as:

$$W = \sum_i W_i \tag{16}$$

Where: $W_i = L_i + \pi_i + cs_i + p_i^* t_i m_i = \sum_h \overline{\omega}_i^h(p)$- portion of aggregated welfare that is originated in sector i, which is different from the objective function of the lobby group (see equation 15). See that $\sum_i \overline{\omega}_i^h(p) = \overline{\omega}^h(p)$.

The government choices are whether to mantain the protectionism status quo or to change it to an open oriented trade policy. In this version of the model the definition of an opening trade policy is not explicit, but it could be thought as a mix of measures that implies : import tariff decreases; elimination of quantitative restrictions and other kind of trade measures; introduce subsidies to the export oriented sectors to diminish the anti export bias that is embodied in the protectionist policy structure. The trade policy regime is defined in the following relationship:

$$r = \{s, o\} \tag{17}$$

Where: s- protectionist trade policy status quo; o- opening trade policy.

The structure of the game is that of a common agency problem. Each lobby maximises its objetive function selecting a contribution scheme, that is an incentive table relating trade policy regime and lobby's income contribution, as follows:

$$\{C_{is}, C_{io}\} \tag{18}$$

Taking into account these lobby's contribution scheme the government selects the trade policy regime maximising its objective function in equation (15). In which follows this problem will be tackled for two cases: the first one deals with the trade policy regime without exceptions; in the second one the case with sectoral exception list is presented.

3 Isolated protections sector and political equilibrium

3.1 Trade policy equilibrium without exceptions

A trade policy regimen $r \in \{s, o\}$ is an equilibrium of this game [2] if there exists a set of contributions $\{C_{is}, C_{io}\}$ one for each lobby i such that:

a) contributions are feasible-

$$C_{ik} \geq 0 \text{ with } k = s, o$$

b) contributions schedules-

$$C_{ik} \leq \max(0, \pi_{ik} - \pi_{ij})$$

where: $j = s, o$; $k = s, o$; $j \neq k$.

c) incentive constraints-

$$\sum_i C_{ir} + aW_r \geq \sum_i C_{ik} + aW_k$$

where: $k = s, o$.

d) No deviation pay-

$\forall i \nexists \widehat{C}_{is} \geq 0$ and $\widehat{C}_{io} \geq 0$, and other regimen $\widehat{r}_i \in \{s, o\}$ such that,

$$\text{i) } \widehat{C}_{i\widehat{r}_i} + \sum_{j \neq i} C_{j\widehat{r}_i} + aW_{\widehat{r}_i} \geq \widehat{C}_{ik} + \sum_{j \neq i} C_{ik} + aW_k$$

$$\text{ii) } \pi_{i\widehat{r}_i} - \widehat{C}_{i\widehat{r}_i} \geq \pi_{ir} - C_{ir}$$

The first condition shows that contributions must be positive to be feasible. The second one says that each lobby can not contribute more than they gain with this particular trade policy regime; thus this condition also says that if there is a loss for the lobby then the contribution will be zero. The third condition it is the incentive restriction that shows that the goverment must be maximising its objective function. The fourth one is the no deviation pay condition, which implies that the outcome is an equilibrium of best response (Nash equilibrium).

In this game is posible to identify two kind of equilibrium. The first one is the trade policy equilibrium without pressure, where there is not contribution from the private sector (lobbies groups) to influence the government's trade policy option. The second one is called the trade policy pressure equilibrium (TPPE);

[2] The definition and typology of equilibrium follows that in Grossman and Helpman (1995).

in this case the government's selection is influenced by the lobby groups' contributions.

A neccesary and sufficient condition of existence of a trade policy unpressured equilibrium (TPUE) is that:

$$a(W_r - W_{\widehat{r}}) \geq \max(0, \max_i(\pi_{i\widehat{r}} - \pi_{ir})) \tag{19}$$

Where $\widehat{r}$ is the alternative regime to r (see result 1 in Grossman and Helpman, 1995).

As it is known that for a small economy always $W_o \geq W_s$ then a TPUE could be done only with $r = o$, then the following expression holds:

$$a(W_o - W_s) \geq \max(0, \max_i(\pi_{is} - \pi_{io})) \tag{20}$$

A TPUE with $r = o$ could only exists if condition 20 is fulfilled. This means that no lobby i in isolated way losses sufficient income to compensate the aggregated gain that the opening trade policy implies. In others words, with the opening trade policy no sector alone with its own contributions could be able to change the selected regime by the government. Though this is an equilibrium it is not robust because it does not resist a coalition proof test. In such a refinament of the equilibrium a Nash is rejected if there exists a set of actions for a subset of actors (coalition) that could increase (or not decrease) the pay off for each of its members taken as given the actions of the no members. It is not necessary to make any monitoring because the proposed action is best response with respect of the actions proposed or taken by the others. The TPUE does not pass this test any time that it is chosen a trade policy regime different from the TPPE.

In the TPPE the contributions are positive for one lobby group at least,

$$C_{ir} > 0$$

The government must be indifferent between the alternatives regimen:

$$\sum_i C_{ir} + aW_r = \sum_i C_{i\widehat{r}} + aW_{\widehat{r}} \tag{21}$$

Suppose now that the previous condition is not fulfilled then the followings expression condition holds:

$$\sum_i C_{ir} + aW_r > \sum_i C_{i\widehat{r}} + aW_{\widehat{r}}$$

In this case, one lobby group could reduce the contributions without influencing the government desicions and improving its own welfare. Then in

equilibrium it could not happened that $G_r > G_{\widehat{r}}$, so the government must be indifferent $G_r = G_{\widehat{r}}$. Every lobby in the lossing side (the ones that prefers $\widehat{r}$ to r, $\pi_{i\widehat{r}} - \pi_{ir} > 0$) must be contributing for $\widehat{r}$ the total amount that each one gains if this regimen is selected (or the amount that each lobby losses if r is selected). On the contrary, for this lobby group it would be profitable to increase the amount of contribution that each of them does to influence and change the government's trade policy decisions. From the winning side no lobby will pay more than each one gain with the selected regimen r. As it is already known no lobby will contribute a positive amount if the government selects a trade policy against it own interest. As Grossman and Helpman point out:."...it is never optimal for a lobby to promise positive gifts for both policy outcomes, because then it could cut back equally on both of its offers without affecting government's decision".

Accordingly contributions from the lossing groups are:

$$C_{i\widehat{r}} = \pi_{i\widehat{r}} - \pi_{ir}, \tag{22}$$

$$C_{ir} = 0 \ , \forall i \ \in \ \mathcal{I}_{\widehat{r}} \tag{23}$$

Where: $\mathcal{I}_{\widehat{r}}$ is the set of sectors i such that $\pi_{i\widehat{r}} - \pi_{ir} > 0$.

Contributins from the winnning groups are:

$$C_{ir} \leq \pi_{ir} - \pi_{i\widehat{r}}, \tag{24}$$

$$C_{i\widehat{r}} = 0 \ , \forall i \ \in \ \mathcal{I}_r \tag{25}$$

Where: $\mathcal{I}_r$ is the set of sectors i such that $\pi_{ir} - \pi_{i\widehat{r}} > 0$.

Combining the previous relations and using the definition of the contributions schedule of the winnning lobbies (24) the next expression comes:

$$\sum_{i \in I_r} (\pi_{ir} - \pi_{i\widehat{r}}) + aW_r \geq \sum_{i \in I_r} C_{ir} + aW_r \tag{26}$$

As the following relation is fulfilled (see equation 22):

$$\sum_{i \in I_r} C_{ir} + aW_r = \sum_{i \in I_{\widehat{r}}} (\pi_{i\widehat{r}} - \pi_{ir}) + aW_{\widehat{r}} \tag{27}$$

then,

$$\sum_i \pi_{ir} + aW_r \geq \sum_i \pi_{i\hat{r}} + aW_{\hat{r}} \tag{28}$$

If a TPPE for a regime r exists then the condition 28 must be fulfilled. Additionally, TPPE existence requires that the following inequality holds:

$$aW_r < \sum_{i \in I_{\hat{r}}} (\pi_{i\hat{r}} - \pi_{ir}) + aW_{\hat{r}} \tag{29}$$

It is neccesary that $C_{ir} > 0$ to sustain the regimen r (Result 2 in Grossman and Helpman, 1995).

To sum up, it has been demonstrated that TPUE and TPPE both could exist. It was shown that the TPUE when exists selects a regime $r = o$. Also the TPPE could be the other regimen s, which happens when the aggregated profits associated with the status quo are greater than the aggregated welfare losses:

$$\sum_i (\pi_{is} - \pi_{io}) \geq a(W_o - W_s)$$

In the case that TPUE and TPPE both exist and support different regimes, it is sounded to concentrate only in the TPPE. The last one is a Nash equilibrium but it is also a coalition proof equilibrium. The TPPE is an efficient equilibrium (for the set of strategic actors of the game lobbies and government, see equation 5.15) thus, applying Bernheim and Winston (1986) result, it is an equilibrium that is also coalition proof.

In summary, in this game the trade policy equilibrium always exists and it is possible to be in one of the following situations presented in table 7.

Table 7
Pressure and Unpressure trade policy equilibrium

	Pressure equilibrium	Unpressure equilibrium
One equilibria	$o = \arg\max_r G_r + \sum_i C_{ir}$	$o = \arg\max_r W_r$
Two equilibrium	$s = \arg\max_r G_r + \sum_i C_{ir}$	$o = \arg\max_r W_r$

Source: own elaboration using Grossman and Helpman (1995).

3.2 Trade policy equilibrium with exceptions

A trade policy equilibrium with exceptions $E(T)$ exists when there are a set of contributions $\left\{\overline{C}_{is}, \overline{C}_{io}\right\}$ [3] $\forall i \in \mathcal{I}$ that satisfies the following conditions:

[3] The overline in the variable C_i is to make a difference in the notation of the contribution schedule when there are exceptions and when there are not as in the previous case.

a) contributions are feasible-

$$\overline{C}_{ik} \geq 0 \text{ with } k = s, o$$

b) contributions schedules-

$$\overline{C}_{ik} \leq \max(0, \pi_{ik} - \pi_{ij})$$

where: $j = s, o$; $k = s, o$; $j \neq k$.
c) incentive constrains-

$$E(T) \in \arg\max_{\bar{E}} \left\{ \sum_{i \in \bar{E}} \overline{C}_{is} + aW_s + \sum_{i \notin \bar{E}} \overline{C}_{io} + aW_o \right\} \tag{30}$$

such that $\sum_{i \in \bar{E}} T_i \leq T$.
d)No deviation pay-
$\forall i \nexists \widehat{\overline{C}}_{is} \geq 0$ and $\widehat{\overline{C}}_{io} \geq 0$, and other $\widetilde{E}_i$ such that,

$$\text{i) } \widehat{\overline{C}}_{iz} + \sum_{j \neq i} \overline{C}_{j\bar{E}_i} + aW_{\bar{E}_i} \geq \widehat{\overline{C}}_{ik} + \sum_{j \neq i} \overline{C}_{iE} + aW_E$$

where: $z = s, o$; $k = s, o$; $z \neq k$.

$$\text{ii) } \pi_{i\bar{E}_i} - \widehat{\overline{C}}_{iz} \geq \pi_{iE} - \overline{C}_{ik}$$

Each $\widetilde{E}$ is a set of excluded sectors from the opening trade policy and it is used to denote a particular trade policy regimen. If $\widetilde{E} = 0$ the government decide to select a trade opening policy without exceptions ($r = o$ in the notation of the previous sub section), alternatively if $\widetilde{E} = \mathcal{I}$ the government mantains the status quo ($r = s$).

The government problem (see condition c)) is:

$$\max_{\bar{E}} \left\{ \sum_{i \in \bar{E}} \overline{C}_{is} + aW_s + \sum_{i \notin \bar{E}} \overline{C}_{io} + aW_o \right\} \tag{31}$$

such that $\sum_{i \in \bar{E}} T_i \leq T$.

Each term in the government objective function will be studied next. In the excluded sectors lobbies gain with the exclusions, so in principle they are willing

to contribute the full amount of the losses to the government caused by these exclusions:

$$\overline{C}_{is} = a(W_{io} - W_{is}) \text{ and } \overline{C}_{io} = 0 \ \forall i \in E \tag{32}$$

$$\overline{C}_{is} + aW_{is} \geq aW_{io}$$

But these sectors must also assure a place in the excluded list, so the question is ¿how much the government lose to gain when it does not exclude the marginal sector?

$$\overline{C}_{\tilde{i}_i s} + aW_{\tilde{i}_i s} \geq \overline{C}_{\tilde{i}_i o} + aW_{\tilde{i}_i o} \tag{33}$$

Where $\widetilde{i}_i$ is the marginal sector that is sector i specific where $i \in E$.

The lobby that is not excluded will pay the full amount that it loses for not being included in the list:

$$\overline{C}_{\tilde{i}_i s} = \pi_{\tilde{i}_i s} - \pi_{\tilde{i}_i o} \text{ and } \overline{C}_{\tilde{i}_i o} = 0 \tag{34}$$

Substituting equations 34 in 33 then the following inequality comes:

$$\pi_{\tilde{i}_i s} + aW_{\tilde{i}_i s} \geq \pi_{\tilde{i}_i o} + aW_{\tilde{i}_i o} \tag{35}$$

How much does the government gain if this marginal sector is included in the list of exceptions?. Using 35 it is possible to answer this question:

$$J_i = (\pi_{\tilde{i}_i s} - \pi_{\tilde{i}_i o}) + a(W_{\tilde{i}_i s} - W_{\tilde{i}_i o}) \geq 0 \tag{36}$$

Then the contributions from the excluded sectors must add this term to compensate the government for the loss accounted in the equation 32.

$$\overline{C}_{is} = a(W_{io} - W_{is}) + J_i \tag{37}$$

To determine the marginal sector it is necessary to solve the following problem:

$$\widetilde{i}_i \in \underset{j \notin E}{\arg\max}(\pi_{js} - \pi_{jo}) + a(W_{js} - W_{jo}) \text{ such that } T_j \leq T_i \tag{38}$$

There are a sub set of sectors that are not excluded but the government would be better off if those sectors were included in the list, the problem is that

there are restrictions over one or more variables and the sum over the excluded sectors on these variables are binded by the restriction T.

How is possible to find the optimum and equilibrium list of excluded sectors?. The list must maximise also the political support function ($PSF = G + \sum_i \Omega_i$)

$$E(T) \in \arg\max_{\bar{E}} \left\{ \sum_{i \in \bar{E}_{is}} (\pi_{is} + aW_{is}) + \sum_{i \notin \bar{E}} (\pi_{io} + aW_{io}) \right\} \tag{39}$$

such that $\sum_{i \in \bar{E}} T_i \leq T$.

As an intermediate stage to find the optimum list of sectors is useful to define the following auxiliary variable:

$$g_i = \frac{(\pi_{io} - \pi_{is}) + a(W_{io} - W_{is})}{T_i} \tag{40}$$

where g_i is the amount of loss by unity of restriction.

The sort criteria to index the sectors is given by the next inequality:

$$(g_i - g_{i+1}) < 0 \ \forall i \ \in \ I \tag{41}$$

The sector where the aggregated welfare gain is equal to the sector loss is denominated sector b, $g_b = 0$. If $g_i > 0 \ \forall i$ then $b = 0$. The sector i for which the sectoral restriction is bounded is denominated sector e:

$$\sum_{i=1 \text{ to } i=e} T_i = T \tag{42}$$

where: $e = \#E$.

The optimum list of exclusions consists of a set of sectors i such that:

$$i \in (0, \min(b, e)) \tag{43}$$

There are three general possible outcomes:

- if $b = 0$ then no sectors will be excluded $E = 0$.
- if $b < e$ then all the sectors in which $g_i < 0$ will be excluded and the restriction is not binding ($\sum_{i=1 \text{ to } i=b} T_i < T$). $E = \{i \in E : i \leq b, \ g_i < 0\}$.
- if $b > e$ then only some sectors where $g_i < 0$ will be excluded and the restriction $\sum_i T_i \leq T$ is binding. This last case is the relevante one.

The consumers' welfare will have the following pattern by construction of the trade reform policy change:

$$W_{io} > W_{is} \ \forall i \in I \tag{44}$$

Using the the lobby's welfare and the definition of the lobby's problem the equilibrium conditions can be written in the following alternative way:

$$\left\{k_i, \overline{C}_{ik}\right\} \in \arg\max_{\bar{k}_i, \overline{C}_{i\tilde{k}}} (\pi_{i\bar{k}_i} - \overline{C}_{i\bar{k}_i})$$

with $k = s, o$, such that the government's incentive constraint is fulfilled,

$$\max_{E} \sum_{j \in \bar{E}_{-i}} (\overline{C}_{js} + aW_{js}) + \sum_{j \notin \bar{E}_{-i}} (\overline{C}_{jo} + aW_{jo}) + \overline{C}_{ik_i} + aW_{ik_i} \tag{45}$$

with $\sum_i T_i \leq T$, and the participation constraint that says that the lobby i must guarantee to the government at least the same level of utility that the government obtains otherwise.

$$G(\overline{C}_{-ik}, \overline{C}_{ik}, E) \geq G(\overline{C}_{-ik}, 0, E_{-i}) \tag{46}$$

To analyse the contribution schedule is useful to make a classification of the lobby sectors. One subset includes those ones that prefer the status quo rather than the opening trade policy ($\pi_{is} > \pi_{io}$, $\forall i \in \mathcal{S}$); the other subset includes those ones that prefer the opening trade policy ($\pi_{io} \geq \pi_{is}$, $\forall i \in \mathcal{O}$). In this last sub set, the sectors' incentives are compatible with the aggregated welfare perspective, so producers in this opening oriented sectors do not need to do any contribution to influence government trade policy choices.

$$\overline{C}_{is} = \overline{C}_{io} = 0 \ , \ \forall i \in \mathcal{O} \tag{47}$$

The following are the relationships between the sub set of sectors:

$$\mathcal{S} + \mathcal{O} = \mathcal{I} \tag{48}$$

$$E \subseteq B \subseteq \mathcal{S} \tag{49}$$

According to this it is possible to identify many alternative situations. In first term, consider the case of a sector $i \in \mathcal{S}$ and $i \notin B$, no matter they are willing to contribute with the full amount that they gain from manteining the status quo ($\pi_{is} - \pi_{io} > 0$) anyway the government will choose the opening

policy (this comes from the definition of the sector index and the variable g_i, see equation 41), this can be expressed in the following way:

$$a(W_{io} - W_{is}) \geq (\pi_{is} - \pi_{io}) \tag{50}$$

$$\overline{C}_{is} \leq (\pi_{is} - \pi_{io}) \text{ and } \overline{C}_{io} = 0 \tag{51}$$

In second term, consider the sectors $i \in B$ and $i \notin E$, that contribute with the full amount of what they lose for not being in the excluded list:

$$\overline{C}_{is} = (\pi_{is} - \pi_{io}) \text{ and } \overline{C}_{io} = 0 \tag{52}$$

Finally, in the sectors in the excluded list $i \in E$ the pattern of contributions are the following:

$$(\pi_{is} - \pi_{io}) \geq \overline{C}_{is} = a(W_{io} - W_{is}) + J_i \tag{53}$$

Susbtituting equation 36 in 53 and re arranging terms the following condition must hold:

$$(\pi_{is} - \pi_{io}) + a(W_{is} - W_{io}) \geq (\pi_{\bar{i}_i s} - \pi_{\bar{i}_i o}) + a(W_{\bar{i}_i s} - W_{\bar{i}_i o}) \tag{54}$$

By definition of the index of sectors (see equation 42) it is known that:

$$\frac{(\pi_{io} - \pi_{is}) + a(W_{io} - W_{is})}{T_i} < \frac{(\pi_{i+1o} - \pi_{i+1s}) + a(W_{i+1o} - W_{i+1s})}{T_{i+1}} \tag{55}$$

As $i < \widetilde{i}_i$ then:

$$\frac{(\pi_{io} - \pi_{is}) + a(W_{io} - W_{is})}{T_i} < \frac{(\pi_{\bar{i}_i o} - \pi_{\bar{i}_i s}) + a(W_{\bar{i}_i o} - W_{\bar{i}_i s})}{T_{\bar{i}_i}} \tag{56}$$

Using the definition of the marginal sector $T_{\bar{i}_i} \leq T_i$ and then using equations 56 the inequality 54 is derived. So, the contribution from all sectors in the exclusion list is less or equal than the gain that it is obtained from being in the exclusion list ($\overline{C}_{is} \leq (\pi_{is} - \pi_{io})$, $\forall i \in E$). The lobby incentive to be in the list is the following:

$$(\pi_{is} - \overline{C}_{is}) \geq \pi_{io} \tag{57}$$

A graphic ilustration of the profits and welfare changes in each sector induced by the alternatives trade policies is presented in figure 1.

Finally consider which is the government incentive to implement a trade policy reform with exceptions in comparison with the two basic previous outcomes. In first term, the comparison is made between the equilibrium outcomes from the opening trade policy (unpressured equilibrium) and the exception list regime:

$$\begin{aligned}(G^E - G^O) &= \left\{\sum_{i\in E}\overline{C}_{is} + aW_{is} + \sum_{i\notin E}\overline{C}_{io} + aW_{io}\right\} - \sum_i aW_{io} = \quad (58)\\ &= \sum_{i\in E}(\overline{C}_{is} + a(W_{is} - W_{io})) = \sum_{i\in E} J_i > 0 \quad (59)\end{aligned}$$

as $\overline{C}_{io} = 0\ \forall i \notin E$.

In second term, the outcomes from the status quo regime (a coalition proof pressure equilibrium) and the exception list regime are compared:

$$\begin{aligned}G^s &= \sum_i C_{is} + aW_s = \sum_i C_{io} + aW_o =\\ &= \sum_{i\in\mathcal{O}}(\pi_{io} - \pi_{is}) + aW_o \quad (60)\end{aligned}$$

as $C_{io} = 0$, $\forall i \in S$ and $C_{io} = (\pi_{io} - \pi_{is})$, $\forall i \in \mathcal{O}$, see also that in this case it holds that $\mathcal{I}_r = \mathcal{S}$ and $\mathcal{I}_{\bar{r}} = \mathcal{O}$ (where the contribution schedule C_{ik} without an over line is the one defined in the previous sub section). So the incentive to do a trade reform with exception in this case is:

$$\begin{aligned}G^E - G^s &= \left\{\sum_{i\in E}(\overline{C}_{is} + aW_{is}) + \sum_{i\notin E}\overline{C}_{io} + aW_{io}\right\} - \left\{\sum_{i\in\mathcal{O}} C_{io} + aW_o\right\} =\\ &= \sum_{i\in E}\overline{C}_{is} - \sum_{i\in\mathcal{O}}(\pi_{io} - \pi_{is}) + a\sum_{i\in E}(W_{is} - W_{io}) =\\ &= \sum_{i\in E} J_i + \sum_{i\in\mathcal{O}}(\pi_{is} - \pi_{io}) =\\ &= \sum_{i\in E}\left\{(\pi_{\bar{i}_i s} - \pi_{\bar{i}_i o}) + a(W_{\bar{i}_i s} - W_{\bar{i}_i o})\right\} + \sum_{i\in\mathcal{O}}(\pi_{is} - \pi_{io}) \quad (61)\end{aligned}$$

The government will have a greater incentive to play the game with rather than without exception when:

- the aggregated loss for the marginal sector in the government's objective function is greater,

- and the aggregated gain for sectors whose profits increase with the opening trade policy is smaller.

This apparently paradoxical result is related with the opportunity cost that the winner side lobbies must pay in both alternatives regimes, with exception (E) or in the status quo one (s).

The comparison of the results between the contribution games, without and with exceptions, should be made keeping in mind that they are different games with different restrictions; in consequence they may have different equilibrium. In fact, the game with exceptions has a set of sectors out of the reform (exception list) and simultaneously this set is restricted to some amount (the sum over this sub set can not be more than some limit T). If there is not any restriction over the sectors to be excepted then the result will be trivial because it holds that:

$$\sum_{i\in B}(\pi_{is}+aW_{is})+\sum_{i\notin B}(\pi_{io}+aW_{io})\geq\sum_{i\in\mathcal{I}}(\pi_{ik_i}+aW_{ik_i}),\ \forall k_i=s,o. \tag{62}$$

by definition of sector b and equation 39.

When a restriction over the exceptions it is imposed then it will be a trade off between the flexibility that the exception list introduce in the trade reform implementation and the fact that this exception list is restricted.

What is the rational to have a restriction in the possibility of excluding sectors from the reform?. There are multiple reasons. For one side, it could be related with international commitments and the necessity of legitimise the trade reform process vis a vis the rest of the world (multilateral institutions of credit and trade, etc). Also, the government could have some others objectives associated with the reform (short term macroeconomic policies, industrial policies, employ policies) that are not explicit in the game and that are introduced in an exogenous way through the restriction. In certain way, the parameter T measures the degree of discretion for the government to carried out the trade reform and this its is an exogenous element of the game structure. The second exogenous aspect is the type of trade reform. In our case, by construction the trade reform is such that for all sectors the following inequality holds:

$$W_{io}>W_{is},\ \forall i\in I$$

This last assumption is reasonable but it is not always necessary to mantain this type of reform. It is obvious that in the aggregate the inequality holds so the reform is evaluated as positive from a consumer perspective:

$$\sum_i W_{io}>\sum_i W_{is}$$

In particular, for the import substitutive sectors (IIS) it is natural that a trade reform, with an opening orientation in a small country, affects positivly on welfare for each of them:

$$W_{io}>W_{is},\ \forall i\in IIS$$

It could happen that for some exporter sectors (ES) the use of different type of subsidies would imply an important increment in relative prices and also the associated fiscal cost of the subsidy and then:

$W_{io} < W_{is}$, for some $i \in ES$

If this would be the outcome it could happene that this welfare cost for the government would be compensated by the income contributions of the exporter sectors that pressure for a reform with this orientation. In this case, for a sub set exporter sectors, favoured by the trade reform, it will be true that $\overline{C}_{io} > 0$.

See that, given the structure of the economy, there are not general equilibrium effect over the price of the mobile factor (salary) that influence, through the protection in one sector the outcomes in others sectors. Cadot, de Melo and Olarreaga (1998) suggest how to modify this assumption in a similar model. In future research this could be a relevant innovation to introduce in the structure of the economy to improve the analytical capability of the contribution game in this new framework.

Finally, it is useful to compare the aggregated welfare outcome of lobbies groups and government (strategic players in the game) in both regimens: the status quo with respect to the trade reform with exceptions. The second equilibrium is preferred to the first one if the following condition holds:

$$\begin{aligned} \sum_{i\in E}(\pi_{is} + aW_{is}) + \sum_{i\notin E}(\pi_{io} + aW_{io}) &\geq \sum_{i\in I}(\pi_{is} + aW_{is}) \Leftrightarrow \\ \sum_{i\notin E}(\pi_{io} + aW_{io}) &\geq \sum_{i\notin E}(\pi_{is} + aW_{is}) \Leftrightarrow \\ \sum_{i\notin Z}(\Delta\pi_i + a\Delta W_i) &\geq -\Big(\sum_{i\notin E \text{ and } i\in Z}(\Delta\pi_i + a\Delta W_i)\Big) \quad (63) \end{aligned}$$

Where: $\Delta\pi_i = (\pi_{io} - \pi_{is})$ and $\Delta W_i = (W_{io} - W_{is})$. Note that the gain of the reform must be greater than the loss that it is incurred because some sectors can not be included in the exceptions list.

4 Trade reform in a particular developing country (Uruguay): a political economy approach.

After the theoretical analyses carried out in the previous section is relevant to summarise which is the group of stylised facts that characterise the trade reform in a particular developing country (Uruguay, see Vaillant, 1999 a)). In first place, it is observed that the Uruguay's trade policy in the last decades (from the 1958 until the present) has been fixed by the Executive Power through a wide set of presidential decrees and very few laws elaborated with the Parliament's participation. This fact points out that the trade policy (tariff or administered) has not been too much influenced, in a direct or indirect way, by the democratic mechanisms of parliamentary representation, but rather it has been established by the government in office with discretion. In the decade

of 1990 the parliamentary intervention is observed in the trade policy matters, but exclusively through the ratification of regional (MERCOSUR in 1991) and multilateral agreements (World Trade Organisation, Agreement of Marrakesh in December of 1994). The government is more limited today not due to the parliamentary intervention but fundamentally to the results of the international trade negotiation.

The revision carried out regarding the mechanisms of organisation of the private sector in pressure groups, points out that this is a mature and diffused phenomenon in the Uruguayan society. There are multiple environments of representation of the groups of interests. It is possible to identify basically two types of groups, the ones favourable to trade reform with a liberalisation orientation (exporters) and the ones against it with protective demands (the imports substitute sectors). The corporate organisation seems more kindred to the analytic pattern employed in the specific factors model (Vaillant, 1998) than to the one developed in the standard trade model (Vaillant,1999 b)). It is evident in all of them the existence of permanent channels of communication with the government. It is also observed that in this relationship the trade policy issues have had a prominent place.

In this sense, it seems reasonable to accept the assumption that trade reform just as it tooks place in Uruguay lends itself to be thought of in terms of a political equilibrium in a game between the private sector and the government in office.

When the trade reform began, in the middle of the seventies, one can affirm that the status quo of trade policy was clearly not a desired situation (in terms of the model it was not incentive compatible). Although at some moment there could have been a political equilibrium, clearly by the middle of the 1970s the commercial policy showed signs of generating a hardly bearable level of distortions for a small economy that is faceing a negative shock of the terms of trade. Surely, there was a favoured sector associated to the external trade able to capture some of the rents that the trade policy distortions generated. However, these minimised and concentrate interests didn't end up compensating the distortions to aggregate welfare. Without doubt this statement has a larger dimension in the context of a growth model (which is beyond the proposed pattern of analysis), but it is possible to accept it as an element that reinforced the need for a change in the trade policy.

Another structural and persistent phenomenon of the trade reform process is tariff escalation (bigger protection to the goods of final use, intermediate to the semi manufacture products , very low to raw materials). In the literature there are some articles (Cadot, De Mello y Olarreaga, 1998) that allow through smaller modifications in the structure of the economy to obtain this characteristic of tariff escalation as an endogenous phenomenon in a model of political contribution.

Surely it is also necessary to think of the trade policy political equilibrium in a dynamic context where the reassignments that the new trade policy is going to generate (in consumption as well as in production patterns) will also modify the political equilibrium. This could be a self-sustained path of unilateral com-

mercial liberalisation. In this sense, more than to use the model to endogenise a historical trade policy status quo, it is interesting to show how this status quo could be modified in an incentive compatible way within a trade policy endogenous model. The fact that protective reversions have not taken place in the process of trade reform (those that were verified are basically founded in problems of handling the short term macroeconomic policy, and they all had a very short duration) could be showing that the path adopted in a reform process was a political equilibrium along the studied period.

In summary, the trade reform in Uruguay could be interpreted using the general framework developed in this last section. In a first stage (during the sixties) a pressure equilibrium with protection is sustained as an equilibrium of the game. There is a protection structure (the status quo) that it is not a political equilibrium in the sense of the original Grossman and Helpman (1994) contribution game (as was shown in Vaillant, 1998), that is import tariff and export subsidies could not be controlled each one with no restriction in a contribution game between lobbies and government. In the new framework the situation is different, lobbies groups and government sustain the global structure of protection that it is compared this with an alternative structure for example a more open oriented trade policy. In this new game, it could happen that unpressured equilibrium with an open oriented policy exist (an this could have been the case in Uruguay) but this it is not a coalition proof equilibrium and so the pressure equilibrium prevails. Suddenly, in the early seventies external conditions changed (terms of trade effect and changes in political institutions) and an opening trade reform with exceptions is implemented,.basically because of the new external conditions the equation (63) is fulfilled. See that by construction the trade reform implies that tariff and subsidies rates are more near the optimum rates in the sense Grossman an Helpman's (1994)[4] first article (see figure 2).

[4] The political support function is:

$$PSF = \sum_i \pi_i + aW_i$$

In Grossman an Helpman (1994) the problem is reduced to solve the following program:

$$\max_{\tau_i} PSF$$

From the FOC of the previous program comes that:

$$\tau_i^{op} = \frac{x_i}{-\frac{\partial m_i}{\partial p_i}} \frac{1}{a}$$

References

[1] Douglas Bernheim and Michael D. Whinston (1986,a): Menu auctions, resources allocation and economic influence , The quarterly journal of economics, vol. C1, Issue 1.

[2] Olivier Cadot, Jaime de Melo and Marcelo Olarreaga, 1998: "Lobbying and the structure of Protection", march, 1998, unpublished paper.

[3] Avinash Dixit, Gene Grossman and Elhanan Helpman, 1997: "Common Agency and Coordination General Theory and Application to tax policy", Journal of Political Economy, September.

[4] Robert Feenstra, Gene Grossman and Douglas Irwin editors, 1996: "The Political Economy of Trade Policy, Papers in Honor of Jagdish Bhagwati", The MIT Press, Cambridge, Massachusetts.

[5] GATT, 1992: "Examen de Políticas Comerciales, Informe de la Secretaría", GATT, Ginebra.

[6] Gene Grossman, Elhanan Helpman, 1994: "Protection for sale", American Economic Review, 84: 833-850.

[7] Gene Grossman, Elhanan Helpman, 1995: "The politics of Free Trade Agreements", American Economic Review, 85.

[8] Gene Grossman, Elhanan Helpman, 1994b:"Electoral competition and special interest politics". The Foerder Institute for Economic Research, Working Paper No 19-94.

[9] Elhanan Helpman, 1995: "Politics and Trade Policy", National Bureau of Economic Research (NBER) Working Papers Series, WP No 5309, Cambridge, USA, October.

[10] Pinelopi Koujianou Goldberg and Giovanni Maggi: "Protection for Sale:an empirical investigation", NBER Working Paper No 5492, Febraury 1997.

[11] Giovanni Maggi and Andrés Rodríguez-Clare, 1998: "Import Penetration and the politics of trade protection", National Bureau of Economic Research (NBER) Working Papers Series, WP No 6711, Cambridge, USA, August.

[12] Gabriel Sanchez, 1996: "Lobbying, innovation and protectionist cycles", Instituto Torcuato di Tella, Seminario 18.

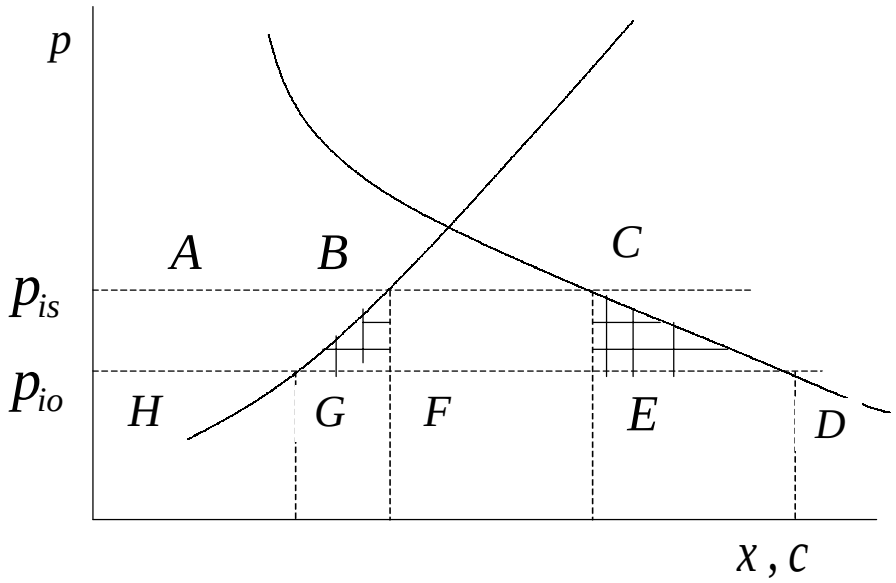
[13] Mathew Tharakan, 1995: "Political economy and contingent protection", The Economic Journal, 105 (Novemeber), 1550-1564.

[14] Marcel Vaillant, 1999 a): "Política Comercial a nivel país y los acuerdos de la Ronda Uruguay: El caso de Uruguay" in press UNCTAD/CEPAL, Chile.

[15] Marcel Vaillant, 1999 b): "Endogenous trade policy and political contributions in a standard-trade model (HOS trade model)", Documento No.8/99, Junio, Departamento de Economía, Universidad de la República, Uruguay.

[16] Marcel Vaillant, 1998: "Endogenous number of lobby group in a specific factor trade model", Documento No.1/98, Setiembre, Departamento de Economía, Universidad de la República, Uruguay.

Figure 2
Welfare and profits changes



$$ABGH = \Delta\pi_i = \pi_{io} - \pi_{is}$$

$$ACDH - BCEF - ABHG = BFG + CDE = \Delta W_i =$$

$$= W_{io} - W_{is}$$

$$If \quad \Delta\pi_i + a\Delta W_i \geq 0, \quad then \quad i \notin Z,$$

$$if \quad \Delta\pi_i + a\Delta W_i < 0, \quad then \quad i \in Z.$$

Figure 1:

Figure 3
Trade reform and optimal tariffs

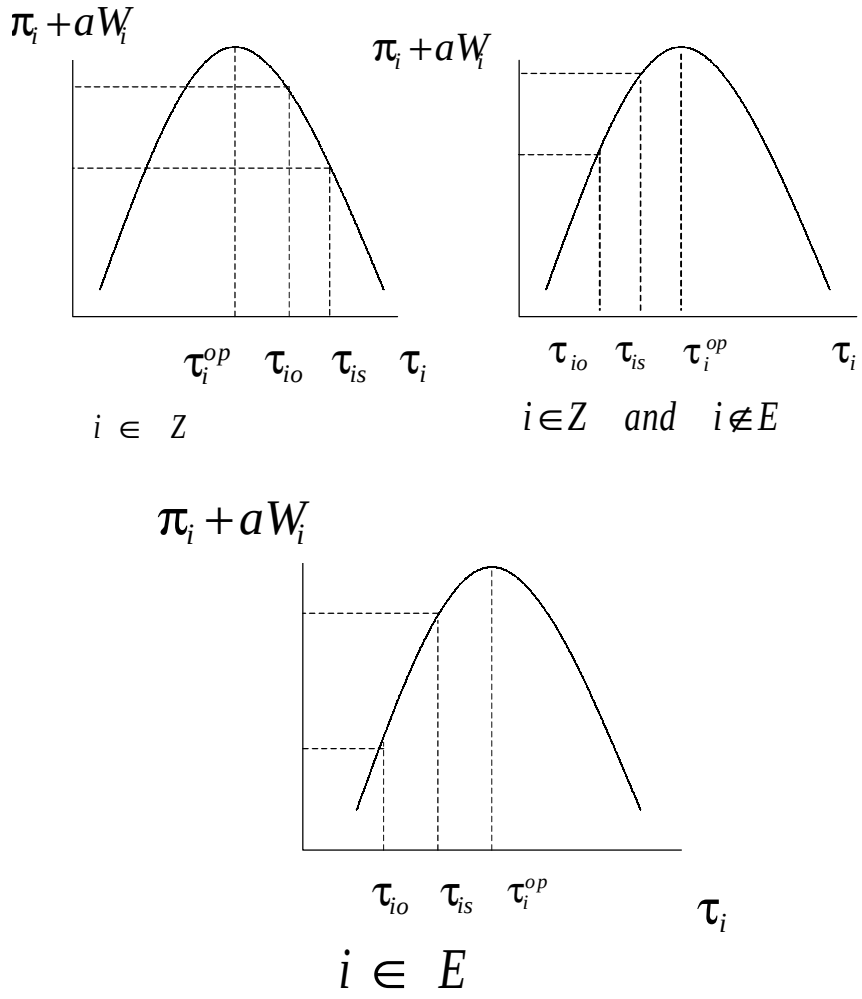


Figure 2: