Mutual Protectionism

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When do countries form Customs Unions (CU) rather than Free Trade Areas (FTA), and what are the consequences for members and non-members? We employ an oligopolistic model of intra-industry trade with political economy considerations to answer these questions. Cruically, we allow for asymmetries in market sizes and number of firms in each country. While it has been shown that an FTA, if its formation from MFN is politically viable, it must also be welfare-improving, this is not the case for CUs formed on top of FTA. Instead, a CU that is improving welfare will always be formed, but a given politically viable CU is likely to be welfare-deteriorating relative to FTA, as it always reduces the consumer surplus and is more likely to be supported if a government is more motivated by firm contributions. We find, the more similar the profiles of the potential CU member, the more likely that it will be formed. In countries are fully symmetric, the CU is always formed. If the countries have sufficiently asymmetric market sizes, the CU tariff is prohibitive for firms from non-member countries to export to the CU country with smaller market size, while the CU tariff is the most exclusionary and fully determined by the larger market size. Thus CU can serve as a bargaining device for a country with smaller market size for multilateral cooperation through commitment to exclusionary policy. We find that any CU formed from an FTA is necessarily trade diverting, reducing the welfare of the rest of the world, increasing profits of CU firms and reducing total consumption, and diverting trade compared to MFN regime. (JEL F55, F15)

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1 Introduction

The preferential trade agreements (PTAs) constitute an exception from the Most-Favoured Nation Clause of the GATT and, later, WTO. However the requirement is that the internal tariffs between the members of the agreement should be brought down to zero for "essentially all goods". The two distinct types of PTAs are Free Trade Area (FTA) and Customs Union (CU), the main formal difference between the being that after elimination of the internal tariff, the members of an FTA are free to set independently their external tariffs, while in a CU they are to coordinate to set a common external tariff. It is known that the FTAs are much more widespread than CUs. The larger extend of spread, probably, contributed to the more intensive studies of the FTAs compared to the CUs.

The spread of the preferential trade agreements between pairs of two or more countries under GATT and WTO has led to many studies addressing the question of what incentives drive the countries to form them, how the political bias of a government affects such decision, whether those agreements are trade creating or trade diverting and, ultimately, whether they are to be considered as steps towards multilateral trade liberalisation or they lower the willingness of governments to engage in further multilateral liberalisation.

This paper takes a focus on these questions as well. And though the literature has brought many insights regarding PTAs, this study adds to our understanding of the PTAs by analysing which kind of Customs Unions are politically viable when both tariff setting and regime change are endogenous.Ornelas (005c) has demonstrated the importance of determining endogenously both the tariff and the trade regime for understanding whether welfare-enhancing or welfare-reducing agreements will be supported politically in case of FTAs, other form of a PTA. More specifically, he showed that the central insight of seminal works Grossman and Helpman (1995) and Krishna (1998) that sufficiently divert trade and create rents for lobby groups will be supported politically is reversed, and only trade creating, sufficiently welfare-enhancing trade agreements will be viable once tariff and regime are choice variables. Freund and Ornelas (2010) point that no such work exists for Customs Unions and it is unclear whether results for FTA also hold for Customs Unions.

There are several studies that focus on the tariff outcomes in the Customs Union. Unlike FTA, where countries only commit to zero internal tariff, in CU they also have to coordinate to set the common external tariff (CET). Kennan and Riezman (1990) in a model of endowment economy simulate different endowment structures and show that national welfare maximising tariff is higher in the CU than in the FTA. The effect rises as the countries in-

ternalize the externalities of the individual decision-making on each other and as well as by increased power market of two countries acting together to tax imports. Other works (Ornelas (2007), Bagwell and Staiger (1999) Cadot et al. (1999), Saggi (2006)) also demonstrate the coordination effect of CU - internalising the effect of higher external tariff on increased gains for the partner country[1]. We show that the coordination effect is strong enough that the CU tariff is always higher than the average of the tariffs applied in FTA. However our analysis brings more insight: if the countries are sufficiently asymmetric then the CU tariff becomes prohibitive to export to the CU member with smaller market for firms from the rest of the world and, moreover, in that case the solution is "corner" in the sense that it is not anymore proportional to the average of the market sizes of the members but is fully determined by the larger market size. Our finding is a case where we do not impose any extra bargaining power to the country with larger market size but in equilibrium, whenever the market sizes are sufficiently asymmetric, the tariff is fully determined by the size of the larger market.[2]In other words, the CU is the most exclusionary when the market sizes of the members are sufficiently asymmetric.

It is ambiguous, though, whether the CU is higher than the average of the MFN tariffs for unrestricted profiles of market sizes and number of firms. The intuition is following, on one hand the CU bears the effect of tariff complementarity that is the driving force for FTA tariff being lower than the MFN tariff (Richardson (1993)) - when countries agree to eliminate internal tariffs, the countries left out of such preferential treatment, are disadvantaged and export less relative to status quo leading to negative effect on consumption and tariff revenue; to compensate, the members of preferential agreement want endogenously to lower the external tariff for non-memers. On the other hand, the CU tariff bears the coordination effect described above which has positive effect on the optimal tariff. Thus, which of the effects dominates, depends on the structure of number of firms of members and non-members. Despite the ambiguity of the difference of MFN and CU tariff, irrespective of number of firms in each country and market sizes, we show that the CU is always trade diverting respective

[1]Bandyopadhyay and Wall (1999) consider tariff lobbying in a CU with intergovernmental tariff setting; they argue tariffs may rise in CU because lobbies choose to target the national government most susceptible to their efforts. Other studies have pointed to the arguments of why the CU tariff might be lower than FTA tariff. Panagariya and Findlay (1994) for example consider tariff setting under lobbying in a customs union. Lobbies either target their national government (FTA) or a supranational body (CU); they argue that, since lobbies are more dispersed at the latter level, a free–rider effect restrains their influence and leads to lower external tariffs under CU than FTA.

[2]This theoretical finding is very much in line with the empirical analysis (World Bank, 2012)of the recent CU of Russia, Kazakhstan and Belarus that was suggesting the most of the tariff lines of CET were based on Russian tariffs.

to both FTA and MFN regime.

We further build on what has been referred to as "static" analysis of endogenous CU tariff given the regime in place by adding the "dynamic" component of strategic decision whether to form a CU from an FTA or not. Our results suggest that the incentives to form a CU from an FTA sharply differ from those when a formation of FTA from MFN takes place. We show that any welfare-improving CU will be supported by government but also a welfare-deteriorating CU might be supported by government if it is sufficiently captured by firm lobbies. The intuition for the result is, as we demonstrate, in equlibrium the firm profits necessarily increase while the consumer surplus necessarily decreases relative to the FTA.

Thus we obtain whether integration from an FTA to a CU increases or decreases welfare is ambiguous. The question whether CU or FTA provide higher welfare also got ambiguous answers in the prior literature. Krueger (1997) argues that the potential welfare effects of an FTA are necessarily inferior to a customs union. Her argument is based on distortions arising from rules of origin (ROO) present in FTA but not in a CU. ROO may require a producer to purchase a higher–price input from an FTA member state rather than a foreign producer in order to benefit from the FTA tariff. Moreover, she argues that national ROO policy is highly susceptible to lobbying so that protection may be "exported" within the FTA through this channel. However, the analysis rests on the assumption that the (exogenous) external tariff of the customs union is an average of previous tariff levels. In a different setting (political economy with imperfect competition and strategic delegation) Facchini et alt. come to the opposite conclusion that FTA are likely to increase welfare compared to CUs.

Our work is similar in the scope of questions raised to Ornelas (2005 b,c) for the case of CU instead of a FTA. He incorporates the endogenous tariff setting into study of the incentives to form a FTA. He finds that, if the firms can lobby the national tariff then the government will never embrace welfare reducing FTA. The reason is that the endogenous reduction of tariff in FTA, together with opening up the local market to the firms from partner country, leads to the reduction of profits of local firms in home country. That, in turn reduces the contributions the government receives from the firms. Hence, in order for any FTA to satisfy the participation constraint of the government, the social welfare should increase, and enough to compensate for the contributions reduction. With similar logic, Ornelas (2005b,c) shows that at the same time a welfare-improving FTA might be blocked by the government - if the welfare increase is not sufficient to compensate for the reduction in contribution. And social welfare is higher both for member and non-members. The results

are demonstrated both in perfect competition with specific factor model Ornelas (005b) and in oligopolistic competition modelOrnelas (005c) . Further, in oligopolistic setting even if the firms can lobby for regime change, the results still hold as any FTA increases consumer surplus and, thus, guaranteeing that any FTA that is accepted is also improving welfare. The results for CU are strikingly different, in some ways, opposite to those of FTAs. Not only CUs are trade diverting, the consumer surplus is always lower than in FTA for both members while profits are always higher and the accepted CU can well be harming the social welfare of both the members and the outside countries.

Another important concern for studies of preferential trade agreements is the effect they have on incentives for multilateral liberalistion[3]. Our findings are in line with Saggi (2006)[4] that exclusionary properties of CU can help cause of cooperation when the countries are asymmetric. Specifically, when the non-member country would be the binding constraint for liberalisation in FTA or MFN regime, by facing an exclusionary policy in CU it is more willing to cooperate. Our results suggest further that if a country with small market size that previously would have weak bargaining position creates a CU with a country with much larger market size, the exclusionary tariff that it commits to can serve as a powerful bargaining device.

Krishna (005b) constitutes a review and discussion on how the PTAs affect the incentives to engage in multilateral negotiations. Freund and Ornelas (2010) provide an extensive and very insightful summary and discussion on theoretical and empirical literature on PTAs.

This work builds upon existing results mainly through analysis of CUs. In particular, we

[3]Levy (1997) argues that bilateral trade agreements can diminish the incentive to engage in multilateral liberalization when they deliver disproportionate gains to the decision-influencing agents in the economy. Ornelas (005a)points that, on one hand, the FTA diminishes the role of politics in decision-making of the government and, hence, barriers to efficient liberalisation but, on the other hand, precisely the trade creating effect of FTA also reduces the incentive of the non-meber country to engage in multilateral liberalisation.

Saggi and Yildiz (2010) use coalition formation theory to assess how the option of forming an FTA affects the willingness to have global free trade. Their main result is that FTAs appear to be only a building block to global free trade. Saggi et al. (2011) analyse the presence of the option to form a CU on further multilateral liberalisation in an endowment model. Unlike the FTA, the CU is not always a building block - instead, it can hinder multilateral cooperation by serving as an exclusionary device towards non-members. However in some circumstances of asymmetric endowments the CU can help the cause of global free trade.

[4]Saggi (2006) analyses how the participation in a PTA affects the possibilities for multilateral cooperation in oligopolistic model of infinitely repeated tariff game. He finds a PTAs hinder multilateral cooperation when countries are symmetric as by introducing asymmetry in the policy they necessarily affect downwards the incentive to cooperate of either non-members (FTA) or members (CU). However when there are asymmetries in cost or market size, under some circumstances, precisely the asymmetry of the policy of PTAs relative to MFN may improve the willingness to cooperate of the "constraint" country.

look at the endogenous formation of a CU to analyse whether political bias of the government makes more likely supporting welfare-improving or welfare-decreasing agreements and compare these incentives with those for formation of FTAs. And further, we also look at how the prospects of multilateral liberalisation is affected by the CUs. In the process of that analysis we also highlight the differences that rise from the similarity of the production structure of the member-countries. Allowing the number of firms in countries be different, we are also able to determine the effect of competition on endogenous formation of trade blocs.

The following comes as: Section 2 describes the basic model, Section 3 derives the policy and equilibrium under Most Favoured Nation (MFN) trade regime, Section 4 considers FTAs, Section 5 - Customs Union, Section 6 discusses multilateral cooperation.

2 Model

The model in which these questions are to be addressed is closely related to Krishna (1998) and Brander and Krugman (1983). We consider three countries, two of which – X and Y – are parties to a potential preferential trade agreement, and the rest of the world, represented as country Z.

In this framework, we consider both forms of preferential trade arrangements such as a free trade area or customs union between X and Y and "global" trade liberalisation with respect to Z, the rest of the world. Moreover, we assess the prospects for global free trade after regional CU/FTA were formed. We will give pride of place to two factors: first, how the structure of production differs between the potential partner countries. Second, how the level of the political bias of governments affects policy and welfare consequences. The timing of the model is summarised in figure 2.1. In the first stage, a trade agreement is exogenously proposed. This may be a free–trade agreement, in which the parties commit to setting a zero tariff on some or all products traded between them but retain sovereignty over external tariff rates. Alternatively, a customs union may be proposed, which includes a zero internal tariff for the goods covered by the agreement and a decision mechanism through which the then–common external tariff is to be set. For such agreements to come into effect, they must be accepted unanimously by all parties (with or without transfers). Finally, we consider the possibility that each country unilaterally sets tariffs under the MFN regime.

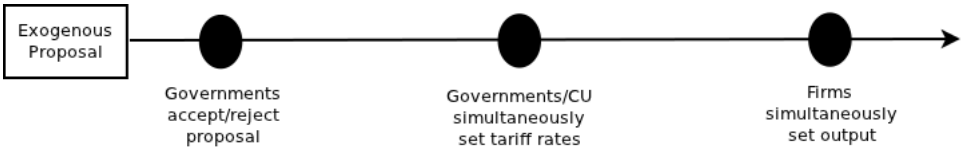

Figure 2.1: Timing of the Model

There are two sectors: a numeraire good C and a tradable good, A, that is produced a Cournot market. In each country $i = X, Y, Z$ there are n_i single–product firms. We denote $N \equiv \sum_{i=X,Y,Z} n_i$ The production of C is competitive.

There is no fixed cost but firms incur a constant marginal cost c per unit produced.

Firms may separately determine the quantity they supply to each country, so let q_{ij} denote the quantity a firm based in country j and producing in sector A sells to country i. The importing country i may levy a per–unit tariff t_{ij} on imports of good A from country j; thus we allow for potentially different tariffs by sector and exclusion of goods from a PTA. The firm's cost function becomes

$$C_{ij}(q_{i,j}) = (c + t_{ij})q_{ij} \tag{2.1}$$

Consumer preferences are linear–quadratic:

$$U_i(Q_i^A, Q_i^C) = Q_i^C + (\Gamma_i Q_i^A - \frac{{Q_i^A}^2}{2}) \tag{2.2}$$

The utility of consumption in sector A is scaled by a country parameter Γ_i that reflects the market size. We assume that the budget constraint does not bind on the demand of A.

That allows us to write the representative consumer indirect utility in i as:

$$CS_i = \Gamma_i Q_i^A - \frac{(Q_i^A)^2}{2} \underbrace{- P_i^A Q_i^A + TR_i^A}_{Q_i^C} \tag{2.3}$$

where TR_i^A is the tariff revenue collected by the government from foreign firms which is distributed among the consumers.

We consider a rather general objective function of the government when setting the tariff and agreements policy:

$$max\, G_i = CS_i + \Pi_i + \alpha\Pi_i$$

where CS_i is the total consumer surplus in the country i, Π_i is the total sum of the profits of the firms from country i, and parameter α represents the political bias of the government.

Helpman (1995) provides an interesting analysis and discussion on the interpretation and consequences of different α values on the government trade policy.

If $\alpha = 0$ the government is maximizing the social welfare, while an $\alpha > 0$ is a case where understand that the government is motivated by rent–seeking to some extent. We do not model explicitly the lobbying process in each country, but capture the essential feature that producers weigh more heavily here than consumers. (footnote of where to look for modelling lobbying). The idea is that the industry lobby groups will optimally decide to give in contributions to the government an amount proportional to their profits. If α is very large, then the government preferences are close to lexicographic and, thus trade reform that benefits consumers can be implemented, but only so long as it does not hurt producers.

If $\alpha < 0$, the government puts higher weight on the consumer surplus. Indeed, such situation would rise when, as is discussed in Helpman (1995), consumers are homogeneous except for their ownership of the firm and, moreover, as it is often the case in reality, the ownership is concentrated. Then, if consumers are ordered by their ownership, the median consumer owns zero shares of the firms. Hence, the government that is maximising of such median voter preferences, would have $\alpha = -1$. For the following part, however, we focus on $\alpha \geq 0$, that is the government is either a benevolent social welfare maximiser or puts extra weight to firm profits (as a result of policy-contingent contributions).

2.1 Market Outcomes

The model will be solved by backwards induction, since our solution concept is Subgame Perfect Nash Equilibrium.

The consumers' problem in country i is to maximise equation 2.2 subject to the budget constraint $Q_i^C + p_i^A Q_i^A = M_i$. As discussed above, income is sufficiently large that the constraint does not bind on demand for good A. We thus have demand function for good A (we drop the superscript in the following to simplify notation):

$$p_i^*(Q_i) = \Gamma_i - Q_i$$

Firms separately set quantities they sell in each country. A firm producing good A in country j faces tariff t_{ij} when selling to country i, which is added to the marginal cost. Hence the firm's problem is

$$\max \pi_{ij} \quad = \quad q_{ij} p_i^*(Q_i) - C_{ij}(q_{ij})$$

where $Q_i = \sum_{j=\{X,Y,Z\}} n_j q_{ij}$, the total supply of good A in the i market. The firm's best response function and maximised profit as follows:

$$q^*_{ij} = max(0, \frac{\Gamma_i - c + \sum(n_j t_{ij})}{N^k + 1} - t_{ij}) \tag{2.4}$$

$$\pi^*_{ij} = (q^*_{ij})^2 \tag{2.5}$$

where $j = X, Y, Z$.

Remember that the home firms do not pay a tariff while the foreign firms do. That tariff creates competitive advantage for home firms and increases their profits - a source of lobbying incentive for high import tariff at home. At the same time the tariff hurts the foreign firms, both directly and by creating competitive disadvantage, and that is a source for lobbying low import tariff in the foreign country.

Summing over all firms in all countries of the sector A, we find the equilibrium market output Q_i in terms of parameters to be

$$Q_i = \frac{\sum n_j(\Gamma_i - c) - \sum(n_j t_{ij})}{N + 1} \tag{2.6}$$

As the marginal cost is equal among all firms, we can normalize the cost$c = 0$.

3 MFN Trade Policy

In this section we consider the baseline case - unilateral decision-making of the countries subject to MFN clause only.

We now solve the government's problem under a unilateral trade policy, without any PTA. Because non–discriminatory principles apply, $t_{ij} = t_{im}$ for all $j, m = X, Y, Z \backslash i$ and $m \neq j$.

The appropriate version of government policy on the tariff for good A from equation 2.4 and 2.5 is then

$$\max_{t_i} \Gamma_i Q_i - \frac{(Q_i)^2}{2} \underbrace{-P_i Q_i + TR_i}_{Q_i^C} + (1 + \alpha)\Pi_i$$

Further, we denote q_{ii} and q_{ij}- quantity of good A produced by a local and foreign firm, respectively and use the expression for the demand $P_i = \Gamma_i - Q_i$ to rewrite the objective as:

$$\max_{t_i} \frac{(Q_i)^2}{2} + \Sigma n_j q_{ij} t_{ij} + (1 + \alpha) n_i (q_{ii})^2$$

which is a function of the tariff of country$i$ on imports of good A and its production and consumption. The other goods or their tariffs do not enter due to the independence of the sectors.

The government maximises the weighed sum of the consumer surplus (which consists of consumption utility derived from income and tariff revenue) and the home producers' profits.

Remark. For illustrative purposes, hereinafter our focus shall be on country X as the home country and Y, Z - foreign. Further, the country Y is the potential PTA partner of home country X.

Proposition 1. *The optimal external tariff in MFN regime is positive, increasing with the political bias of government, decreasing with the tightness of competition in foreign countries. The effect of home competition is ambiguous: the tariff is decreasing, unless the foreign competition is significantly stronger than home competition. The political bias must be* $\alpha < 1/2n_X$ *for non-zero imports of country* X *from the rest of the world in equilibrium.*

Proof. The FOC of the government's objective is:

$Q_i^k \frac{dQ_i}{dt_i} + \Sigma n_{j\neq i} q_{ij} + \Sigma n_{j\neq i} \frac{dq_{ij}}{dt_i} t_i + (1+\alpha) 2 n_i q_{ii} \frac{dq_{ii}}{dt_i} = 0$

Substitute the derivatives from market outcomes

$Q_i \frac{-\Sigma n_{j\neq i}}{N} + \Sigma n_{j\neq i} q_{ij} + \Sigma n_{j\neq i} \frac{-(1+n_i)}{N} t_i + (1+\alpha) 2 n_i q_{ii} \frac{\Sigma n_{j\neq i}}{N} = 0$

Simplify:

$q_{ij} N + (1+\alpha) 2 n_i q_{ii} - Q_i - (1+n_i) t_i = 0$

Substitute the quantities form market outcomes:

$\Gamma_i - t_i(1+n_i) + (1+\alpha) 2 n_i \frac{\Gamma_i}{N+1} + (1+\alpha) 2 n_i \frac{\Sigma n_{j\neq i} t_i}{N+1} - \frac{\Gamma_i N}{N+1} + \frac{\Sigma n_{j\neq i} t_i}{N+1} - (1+n_i) t_i = 0$

Then notice that the condition guaranteeing interior solution and sufficiency of FOC is that $\alpha < \bar{\alpha}^{MFN} = \frac{1}{2n_X} + \frac{(n_X+1)^2}{n_X(n_Y+n_Z)}$.

And finally solve for t_i^{MFN}

$t_i^{MFN} = \Gamma_i \frac{2(1+\alpha)n_i+1}{(-(1+\alpha)2n_i)\Sigma n_{j\neq i} - \Sigma n_{j\neq i} + 2(1+n_i)(1+n_i+\Sigma n_{j\neq i})} = \Gamma_i \frac{(1+\alpha)2n_i+1}{(1-\alpha 2n_i)\Sigma n_{j\neq i} + 2(1+n_i)^2)}$

Solving the FOC provides the required expression for optimal tariff of good A imported from Z to X is given by:

$$t_X^{MFN} = \frac{\Gamma_X(2(1+\alpha)n_X+1)}{(1-2\alpha n_X)(n_Y+n_Z) + 2(n_X+1)^2}, \alpha < \bar{\alpha}^{MFN}$$

It is easy to see that for an interior t_X^{MFN} is decreasing with the competition in the foreign countries Y and Z iff $\alpha < 1/2n_X$. However the equilibrium production of firms from Y

and Z obtained by plugging in the optimal tariff $\frac{\Gamma_X(1-2\alpha n_X)}{(1-2\alpha n_X^A)(n_Y+n_Z)+2(n_X^A+1)^2}$ is also positive iff $\alpha < 1/2n_X$. Moreover, $\frac{t_X^{MFN}}{dn_Y} = \frac{t_X^{MFN}}{dn_Z} = -\frac{\Gamma_X(2(1+\alpha)n_X+1)(1-2\alpha n_X)}{((1-2\alpha n_X)(n_Y+n_Z)+2(n_X+1)^2)^2}$

To show the last claim we take the derivative and after manipulations get that t_X^{MFN} is decreasing in n_X iff

$$n_Z + n_Y < \frac{2(n_X+1)(n_X(1-\alpha)+\alpha)}{(2\alpha+1)}$$

□

The condition for equilibrium imports to be positive in equilibrium $\alpha < 1/2n_X$ does not depend on the competitiveness of foreign countries but only on home conditions. Moreover, it is very strict and means that for oligopolistic industry with several firms it is pretty close to zero. The intuition behind the result is that in the framework of imperfect competition the foreign firms are in a strong disadvantage even if they face a benevolent government. Hence, the potential for the government to be lobby-driven and receive contributions is limited by the structure of the market. The more competitive is the home market, less scope is available for tariff manipulations. Empirical literature that tried to estimate the bias of the government using Grossman and Helpman (1995) model, consistently found very low bias α. And though these estimates are based on a different model, these estimates give credibility to the imperfect competition model which explains why such results are obtained.

4 Free Trade Agreement

We now consider tariff setting under a free–trade agreement between countries X and Y. Due to the FTA, the tariff rates $t_{XY} = t_{YX} = 0$ for good trades of A. What remains is for each country to set the external tariff unilaterally. We will denote all the variable choices in the FTA with a corresponding superscript. The following proposition summarizes changes in the optimal external tariff set by the members of the FTA.

Proposition 2. *The optimal external tariff in the FTA is lower than the unilateral tariff for all member-countries. The more competitive is the rest of the world, the stronger is the reduction. The threshold for political bias is higher than in MFN: $\alpha < \frac{1+2n_Y}{2n_X}$ for non-zero imports of country X from the rest of the world in equilibrium .*

Proof. We first notice that the condition guaranteeing interior solution and sufficiency of FOC is that $\bar{\alpha}^{FTA} < \frac{1+2n_Y}{2n_X} + \frac{(n_X+n_Y+1)^2}{n_X n_Z}$. Note that the condition for interior solution in

MFN setting is tighter than in case of a FTA.

The FOC of government's objective is:

$Q_i\frac{dQ_i}{dt_i} + n_Z q_{ij} + n_Z\frac{dq_{ij}}{dt_i}t_i + (1+\alpha)2n_i q_{ii}\frac{dq_{ii}}{dt_i} = 0$

Substitute the derivatives:

$\frac{-Q_i}{N} + q_{ij} + \frac{-(1+n_i)}{N}t_i + \frac{(1+\alpha)2n_i q_{ii}}{N^K} = 0$

Rearrange:

$-Q_i + q_{ij}N - (1+n_i)t_i + (1+\alpha)2n_i q_{ii} = 0$ - Note that this expression is equivalent to the one for the MFN and it is the change in the expressions for the quantities that will make the difference.

Substitute the market outcomes:

$\Gamma_i - \frac{\Gamma_i N}{N+1} + \frac{n_Z t_i}{N+1} + (1+\alpha)2n_i\frac{\Gamma_i}{N+1} + (1+\alpha)2n_i\frac{n_Z t_i}{N+1} - 2(1+n_X+n_Y)t_i = 0$ - Here we see that at $t_i = t_i^{MFN}$ the FOC is not satisfied as the expression is strictly negative. As the function is strictly concave and single-peaked, the derivative is negative on the right from the peak which proves that the t_i^{FTA} that satisfies the FOC is less than the MFN tariff $t_i^{FTA} < t_i^{MFN}$:

$$t_i^{FTA} = \Gamma_i\frac{2(1+\alpha)n_i + 1}{(1-\alpha 2n_X + 2n_Y)n_Z + 2(1+n_X+n_Y)^2)}, \alpha < \bar{\alpha}^{FTA}$$

The second statement can be rewritten as $d(t_i^{MFN} - t_i^{FTA})/dn_Z > 0$, or $1 < -\frac{t_i^{FTA}}{dn_Z}/-\frac{dt_i^{MFN}}{dn_Z}$. Remember that $\frac{dt_i^{MFN}}{dn_Z}$ is negative.

The change in t_X^{FTA} with marginal change in n_Z is:

$\frac{t_X^{FTA}}{dn_Z} = -\frac{\Gamma_X(2(1+\alpha)n_X+1)(1-\alpha 2n_X+2n_Y)}{((1-\alpha 2n_X+2n_Y)n_Z+2(1+n_X+n_Y)^2))^2}$

The change in t_X^{MFN} with marginal change in n_Z is:

$\frac{t_X^{MFN}}{dn_Z} = -\frac{\Gamma_X(2(1+\alpha)n_X+1)(1-2\alpha n_X)}{((1-2\alpha n_X)(n_Y+n_Z)+2(n_X+1)^2)^2}$

Divide the first by second expression to obtain the required result:

$-\frac{t_i^{FTA}}{dn_Z}/-\frac{dt_i^{MFN}}{dn_Z} = \frac{(1-\alpha 2n_X+2n_Y)((1-2\alpha n_X)(n_Y+n_Z)+2(n_X+1)^2)^2}{(1-2\alpha n_X)((1-\alpha 2n_X+2n_Y)n_Z+2(1+n_X+n_Y)^2))^2} > 1$ □

One can see the interesting outcome that forming an FTA leads to a decrease of the import tariff rate. The abolishment of the tariffs between X and Y created a comparative advantage for firms from Y and the supply of a good from the partner country, ceteris paribus, has increased while the supply from Z has decreased. Note that the discrimination effect the firms from Z experience is on top of the direct negative effect of the amount of tariff they have to pay. Now, if the tariff in FTA would stay the same in MFN, the tariff revenue would drop for two reasons: first, in MFN both firms from Y and Z pay the tariff while in FTA only the firms from Z do, and second, as it was mentioned, if the tariff would stay the same, import from Z would decrease. These effects are the driving force behind the fall of external

tariff in FTA - a compensation for firms from Z in order to increase the total output and the tariff revenue.

The number of firms in the rest of the world has following effect on the government's objective: on one hand, if there are more firms, the stronger is the negative impact of the tariff on the total amount consumer in the country, but on the other hand, the more is the gain from tariff for the local firms. Thus, if the government is not captured by lobbies enough to set a prohibitive tariff, the negative effect on the consumption level will dominate and the tariff is decreasing with the number of firms in the rest of the world.

Proposition 3. *Consumer surplus is always higher under FTA than under MFN. As a consequence, a welfare-reducing Free Trade Area will not be politically viable, whether the firms lobby only the tariff setting or also the trade regime change.*

Proof. We start the proof of Lemma that shows how consumer surplus changes in FTA.

Lemma 1.The consumer surplus is increasing in any FTA compared to MFN.

The consumer surplus is written as:

$CS_i = \frac{Q_i^2}{2} + TR_i = \frac{Q_i^2}{2} + \sum_j q_j n_j t_i = \frac{Q_i^2}{2} + \sum_j q_j n_j t_i$

Let us evaluate the difference of the consumer surplus in FTA and in MFN regime for fixed arbitrary t_X:

$CS_i^{FTA}(t_X) - CS_i^{MFN}(t_X) =$

$= (\frac{\Gamma_X N - t_X n_Z}{1+N})^2 \frac{1}{2} + q_j n_Z t_X - (\frac{\Gamma_X N - t_X n_Z}{1+N})^2 \frac{1}{2} - (\frac{-t_X n_Y}{1+N})^2 \frac{1}{2} + \frac{2\Gamma_X N t_X (n_Y+n_Z)}{(1+N)^2} \frac{1}{2} - q_j (n_Y+n_Z) t_X =$
$-(\frac{-t_X n_Y}{1+N})^2 \frac{1}{2} + \frac{2\Gamma_X N t_X (n_Y+n_Z)}{(1+N)^2} \frac{1}{2} - q_j n_Y t_X$

$t_X(-\frac{t_X n_Y^2}{(1+N)^2} \frac{1}{2} + \frac{2\Gamma_X N (n_Y+n_Z)}{(1+N)^2} \frac{1}{2} - \frac{\Gamma_X n_Y - t_X (1+n_X) n_Y}{1+N}) = t_X(-\frac{t_X n_Y^2}{(1+N)^2} \frac{1}{2} + \frac{\Gamma_X N (n_Y+n_Z)}{(1+N)^2} - \frac{\Gamma_X n_Y}{1+N} +$
$\frac{t_X (1+n_X) n_Y}{1+N})$

$t_X(\frac{\Gamma_X (N-1) n_Y}{(1+N)^2} + \frac{2 t_X n_Y (1+n_Z+(N+2) n_X)}{(1+N)^2}) > 0$

Now if we set $t_X = t_X^{MFN}$ the difference in consumer surplus from shifting from MFN to FTA keeping the tariff fixed would be: $t_X^{MFN}(\frac{\Gamma_X (N-1) n_Y}{(1+N)^2} + \frac{2 t_X^{MFN} n_Y (1+n_Z+(N+2) n_X)}{(1+N)^2}) > 0$. However we know that the tariff applied in FTA is lower than $t_X^{FTA} < t_X^{MFN}$ while the tariff that maximises the consumer surplus is lower than the one maximising government objective in FTA: $t_X^{CS} \leq t_X^{FTA}$ as $t_X^{CS} = t_X^{FTA}(\alpha = -1)$ and we know that t_X^{FTA} is increasing in α. Hence, as the consumer surplus function is decreasing on the right from its peak, we have that $CS_i^{MFN}(t_X^{MFN}) < CS_i^{FTA}(t_X^{MFN}) < CS(t_X^{FTA})$

Now, that we have established that the consumer surplus rises in FTA relative to MFN, assume that the government would support the welfare-reducing FTA, that is $CS_X^{\triangle FTA} + (1+\alpha)\Pi_X^{\triangle FTA} > 0$ but the welfare change in negative $CS_X^{\triangle FTA} + \Pi_X^{\triangle FTA} < 0$ where for a

function f: $f^{\triangle FTA} = f^{FTA} - f^{MFN}$. Hence, we must have $\alpha\Pi_X^{\triangle FTA} > 0$ and for any $\alpha > 0$ we have $\Pi_X^{\triangle FTA} > 0$. Together with the finding of the Lemma that $CS_X^{\triangle FTA} > 0$ we reach a contradiction.

Instead, if an FTA is welfare-improving, i.e. $CS_X^{\triangle FTA} + \Pi_X^{\triangle FTA} > 0$ but $\Pi_X^{\triangle FTA} < 0$ then for sufficiently large α the FTA welfare-improving FTA will not be supported by politically motivated government. □

The proposition 3 extends the result of Ornelas (2005c) by having the possibility different market sizes and number of firms. His results are very important for understanding the equilibrium effects of FTAs - when the endogenously set tariff is incorporated into the political economy model of choosing a trade regime, it appears that only welfare-enhancing FTA will are supported politically and that FTAs are actually trade creating. That is in contrast to the intuition of papers like Grossman and Helpman (1995) and Krishna (1998) which suggest that trade diverting FTA are more likely to be accepted by the contribution-driven governments. We apply analysis similar to Ornelas (2005) for CUs and will see that the properties of CU are strikingly different from FTAs.

5 Customs Union

In the customs union, tariff setting becomes a joint policy of the member countries. This of course requires a specification for the tariff–setting process. In this preliminary investigation, we consider a *unitary* body setting the tariff; that is, the objective of the CU Commission is simply to maximise the sum of government utilities of the two countries.

$$\max_t G_X + G_Y$$

More precisely, the objective of the Customs Union tariff setting body is the sum of the government welfare in each country, assuming that the political bias α is the same in member-countries:

$$\max_t CS_X + (1+\alpha)\Pi_X + CS_Y + (1+\alpha)\Pi_Y$$

The main difference from the previous cases is that now profits of the firms from X in operating Y as well as profits of firms from Y operating in X are present in the objective. Instead, when the governments were setting individual tariff rates, only the profits of the firms from the country itself were directly present in the objective. That presence of the

profits of the firms in the partner country in the objective is the source of the mutual protectionism. That protectionism naturally rises when countries have to coordinate, though the coordination itself is not necessary: if the countries could internalize the effects of their tariff setting on each other but still be free to set different tariffs, the protectionism would still be there, even more, they would reach a weakly higher joint government welfare if they would not be constrained to set the same tariff.

The next proposition summarizes the CU tariff properties relative to individual FTA tariffs.

Notation: Let $t^{MFN}(\Gamma, n, n_Z)$ denote the optimal MFN tariff of a country with market size Γ and number of firms n and the number of firms in the rest of the world n_Z.

Proposition 4. *Optimal tariff in a Customs Union is higher than each of individual tariffs of members in FTA.*

The exports of the CU from the rest of the world are positive whenever the political bias $\alpha < \frac{1}{2(n_X+n_Y)}$. *In that case:*

a) If market sizes of members are sufficiently symmetric the CU tariff is $t^{CU} = t^{MFN}(\frac{\Gamma_X+\Gamma_Y}{2}, n_X + n_Y, n_Z)$. *The export of the rest of the world to both members of CU is positive.*

b) If the market sizes of members are sufficiently asymmetric the CU tariff is $t^{CU} = t^{MFN}(\Gamma_i, n_X + n_Y, n_Z)$ *where* $\Gamma_i = max\{\Gamma_X, \Gamma_Y\}$. *The export of the rest of the world to the member of the CU with smaller market size is zero.*

Proof. The proof of this proposition is presented in the Appendix due to its size. □

The result that the CU tariff is always higher than its individual FTA tariff in equilibrium, is not straightforward. Indeed, the basic idea behind the CU tariff is coordination, which then suggests that the common tariff should proportional to the average market size of the member countries, and indeed that is what we get if we just optimize the joint governments' objective. However the FTA tariff is always proportional to the country's own market size. That, in turn, suggests that with sufficient asymmetries we could observe that the CU tariff by being proportional to the average market size is smaller than the FTA tariff of country with larger market size. However we show that it is never possible because whenever the countries are sufficiently asymmetric for such effect to rise, it appears that the CU tariff is prohibitive for firms from the rest of the world in the smaller tariff. And when that happens, the optimal tariff is "corner" - in the sense, that it becomes proportional not to the average market size but to the larger market size only. Intuitively, it means that if we require asymmetries to be strong enough to imply that the CU tariff is lower than FTA

tariff of country with larger market size, then these asymmetries are always strong enough to make the CU tariff prohibitive in the country with smaller market size. Thus, we show that if countries are sufficiently asymmetric, then the rest of the world does not export to one of the CU members at all, and the optimal CU tariff is fully determined by the larger market size.

We can think of the situation with strong market size asymmetries as where the optimal coordination in equilibrium allocates all weight to the country with larger market size.

The next proposition highlights more aspects where the FTA and CU diverge in their properties. While the competitiveness in the rest of the world was causing the FTA member to make deeper cuts in their external tariffs with respect to MFN tariff, it causes the CU members to increase stronger their common external tariff. And exactly the same picture we observe with the political bias of the government: while the more politically biased governments would cut more the FTA tariff compared to their MFN tariff choices, the more politically biased governments want to increase more their common external tariff:

Proposition 5. *The more governments of member countries are politically biased, the larger is the increase of CU tariff from average of the FTA tariffs. The more competitive is the rest of the world, the larger is the increase.*

Proof. We want to show the political bias increases the difference between the CU tariff and the average of FTA tariffs: $\frac{d(t^{CU}-(t_X^{FTA}+t_Y^{FTA})/2)}{d\alpha} > 0$.

We rewrite the previous expression as $\frac{d(\frac{\Gamma_X}{\Gamma_X+\Gamma_Y}t^{CU}-t_X^{FTA}/2)}{d\alpha} + \frac{d(\frac{\Gamma_Y}{\Gamma_X+\Gamma_Y}t^{CU}-t_Y^{FTA}/2)}{d\alpha} > 0$

Now the first term is

$\frac{d(\frac{\Gamma_X}{\Gamma_X+\Gamma_Y}t^{CU}-t_X^{FTA}/2)}{d\alpha} = \Gamma_X \frac{2(n_X+n_Y)(n_X+n_Y+1)(N+1)}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} - \Gamma_X \frac{2n_X(n_X+n_Y+1)(N+1)}{(1-2\alpha n_X+2n_Y)n_Z+2(n_X+n_Y+1)^2} >$

$>> \Gamma_X \frac{2n_Y(n_X+n_Y+1)(N+1)}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} > 0$

Similarly, one can show that $\frac{d(\frac{\Gamma_Y}{\Gamma_X+\Gamma_Y}t^{CU}-t_Y^{FTA}/2)}{d\alpha} > 0$ which then together with the previous result establishes the claim.

The next statement can be rewritten as

$\frac{d(t^{CU}-(t_X^{FTA}+t_Y^{FTA})/2)}{dn_Z} = \frac{d(\frac{\Gamma_X}{\Gamma_X+\Gamma_Y}t^{CU}-t_X^{FTA}/2)}{dn_Z} + \frac{d(\frac{\Gamma_Y}{\Gamma_X+\Gamma_Y}t^{CU}-t_Y^{FTA}/2)}{dn_Z} > 0,$

$\frac{d(\frac{\Gamma_X}{\Gamma_X+\Gamma_Y}t^{k,CU}-t_X^{k,FTA}/2)}{dn_Z} = \frac{-\Gamma_X(1-2\alpha(n_X+n_Y))(2(\alpha+1)(n_X+n_Y)+1)}{2(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} + \frac{\Gamma_X(1-2\alpha n_X+2n_Y)(2(\alpha+1)n_X+1)}{2(1-2\alpha n_X+2n_Y)n_Z+2(n_X+n_Y+1)^2} =$

$= -\Gamma_X \frac{(1-2\alpha n_X+2n_Y)(2(\alpha+1)n_X+1)}{2(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} + \Gamma_X \frac{4(\alpha+1)n_Y(2\alpha n_X+\alpha n_Y+n_x)}{2(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} + \frac{\Gamma_X(1-2\alpha n_X+2n_Y)(2(\alpha+1)n_X+1)}{2(1-2\alpha n_X+2n_Y)n_Z+2(n_X+n_Y+1)^2}$

$= \Gamma_X \frac{4(\alpha+1)n_Y(2\alpha n_X+\alpha n_Y+n_x)}{2(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} +$

$+ \frac{-\Gamma_X(1-2\alpha n_X+2n_Y)(2(\alpha+1)n_X+1)(\alpha+1)n_Y n_Z}{2((1-2\alpha n_X+2n_Y)n_Z+2(n_X+n_Y+1)^2)((1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2)} > 0$ □

The next proposition establishes the main effects of CU, once it is established. The intuition for most those impacts comes from the result of Proposition 4 that in equilibrium the CU tariff must be higher than FTA tariff of each member country. These effects that formation of CU on top of FTA brings are strikingly opposite of those that formation of FTA brings:

Proposition 6. *The formation of CU from a FTA is always:*

a) Diverting trade from the rest of the world

b) Reducing total consumption in CU

c) Reducing consumer surplus of CU-members

d) Increasing profits of firms from CU

e) Reducing welfare of the rest of the world

Proof. a) A trade agreement is trade diverting if the import from the rest of the world is reduced with its formation. In the case of formation of a CU from a FTA it can be written as:

$q_{XZ}^{\triangle CU,FTA} + q_{YZ}^{\triangle CU,FTA} = (\frac{\Gamma_X-(1+n_X+n_Y)t^{,CU}}{N+1} - \frac{\Gamma_X-(1+n_X+n_Y)t_X^{FTA}}{N+1}) + (\frac{\Gamma_Y-(1+n_X+n_Y)t^{CU}}{N+1} - \frac{\Gamma_Y-(1+n_X+n_Y)t_Y^{FTA}}{N+1}) =$

$= \frac{2(1+n_X+n_Y)}{N^k+1}(-t^{CU} + \frac{t_X^{FTA}+t_X^{FTA}}{2}) < 0$ as the CU tariff is higher than the average of the tariffs applied by member countries in FTA.

b) Note that $Q_i^{CU} - Q_i^{FTA} = \frac{\Gamma_i N - t^{CU} n_Z}{1+N} - \frac{\Gamma_i N - t_X^{FTA} n_Z}{1+N} = n_Z \frac{-t^{CU}+t_i^{FTA}}{1+N} < 0$ for $i = X, Y$ as we have shown that $t^{CU} > max\{t_X^{FTA}, t_Y^{FTA}\}$.

c) Let us denote as $CS(t)$ the following function$CS_i(t) = \frac{1}{2}(\frac{\Gamma_i N - n_Z t}{N+1})^2 + n_Z t^{FTA}\frac{\Gamma_i - n_Z t}{N+1}$.

Note that it coincides with the governments objective function in FTA for $\alpha = -1$: $CS_i(t) = G_i^{FTA}(\alpha = -1)$

It is also easy to see that $CS(t)$ is concave, single-peaked and maximised at $t_i = \Gamma_i \frac{2(n_i+n_j)+1}{n_Z+2(n_i+n_j+1)^2} < \Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} = t_i^{FTA} < t^{CU}$

It follows then $CS_i^{CU} = CS(t^{CU}) < CS(t_i^{FTA}) = CS_i^{FTA}$

d) The profits of the firms from CU are affected by formation of CU from FTA through their profits from sales in the CU members. As we have shown, the CU tariff is higher than the tariff of each member-country under FTA. It is then straightforward from market outcomes expressions that the increased protection the CU firms observe in each member relative to FTA increases their sales in each country and, consequently, profits which are a quadratic increasing function of sales.

e) Similar to d), the expressions we have derived for market outcomes imply that the increase in tariff that the firms from rest of the world face in each country of CU affects negatively to their export to the members of the CU. That, in turn negatively affects the profits they make in the CU countries, which causes the reduction in the welfare of the rest of the world. □

Proposition 7. *a) If formation of CU with transfers from FTA is enhancing overall welfare, it is also politically viable. If formation of CU is without transfers from FTA in enhancing welfare in each country, it is also politically viable*

b) The formation of CU with transfers from FTA that is reducing overall welfare may be viable for sufficiently high political bias. The formation of CU without transfers from FTA that is reducing welfare in each member may be viable for sufficiently high political bias.

Proof. a) If a CU with transfers is improving overall welfare relative to FTA then the government welfare, which is formed by social welfare and an additional weight on firm profits, will necessarily increase with formation precisely because firm profits are higher in a CU:

if $CS_X^{\triangle CU,FTA} + CS_Y^{\triangle CU,FTA} + \Pi_X^{\triangle CU,FTA} + \Pi_Y^{\triangle CU,FTA} > 0 \Rightarrow$

$CS_X^{\triangle CU,FTA} + CS_Y^{\triangle CU,FTA} + \Pi_X^{\triangle CU,FTA} + \Pi_Y^{\triangle CU,FTA} + \alpha\Pi_X^{\triangle CU,FTA} + \alpha\Pi_Y^{\triangle CU,FTA} > 0$

as it is shown in the previous proposition that $\Pi_X^{\triangle CU,FTA} > 0$ and $\Pi_Y^{\triangle CU,FTA} > 0$

The same argument would apply to the proof of the claim for the CU without transfers.

b)Now assume that a CU is politically viable:

$CS_X^{\triangle CU,FTA} + CS_Y^{\triangle CU,FTA} + (1+\alpha)\Pi_X^{\triangle CU,FTA} + (1+\alpha)\Pi_X^{\triangle CU,FTA} > 0$

but reducing overall welfare. We can rewrite that condition as

$\alpha(\Pi_X^{\triangle CU,FTA} + \Pi_Y^{\triangle CU,FTA}) > -(CS_X^{\triangle CU,FTA} + CS_Y^{\triangle CU,FTA} + \Pi_X^{\triangle CU,FTA} + \Pi_Y^{\triangle CU,FTA)}) > 0.$

or $\alpha > -\frac{G_X^{\triangle CU,FTA}+G_Y^{\triangle CU,FTA}}{\Pi_X^{\triangle CU,FTA}+\Pi_Y^{\triangle CU,FTA}}$

The proof for CU without transfers is analogous. □

Proposition 8. *The CU is necessarily diverting trade compared to MFN regime*

Proof. A trade agreement is trade diverting if the import from the rest of the world is reduced with its formation. In the case of formation of a CU from a MFN it can be written as: $q_{XZ}^{\triangle CU,MFN} + q_{YZ}^{\triangle CU,MFN} = (\frac{\Gamma_X-(1+n_X^k+n_Y^k)t^{k,CU}}{N^k+1} - \frac{\Gamma_X-(1+n_X^k)t_X^{k,MFN}}{N^k+1}) + (\frac{\Gamma_Y-(1+n_X^k+n_Y^k)t^{k,CU}}{N^k+1} - \frac{\Gamma_Y-(1+n_Y^k)t_Y^{k,MFN}}{N^k+1}) =$

$= \frac{(\Gamma_X+\Gamma_Y)(1-2\alpha n_X-2\alpha n_Y)}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} - \frac{\Gamma_X(1-2\alpha n_X)}{(1-2\alpha n_X)(n_Z+n_Y)+2(n_X+1)^2} - \frac{\Gamma_Y(1-2\alpha n_Y)}{(1-2\alpha n_Y)(n_Z+n_X)+2(n_Y+1)^2} =$

$= \frac{\Gamma_X}{n_Z+2(n_X+n_Y+1)^2/(1-2\alpha n_X-2\alpha n_Y)} - \frac{\Gamma_X}{(n_Z+n_Y)+2(n_X+1)^2/(1-2\alpha n_X)} + \frac{\Gamma_Y}{n_Z+2(n_X+n_Y+1)^2/(1-2\alpha n_X-2\alpha n_Y)} - \frac{\Gamma_Y}{(n_Z+n_X)+2(n_Y+1)^2/(1-2\alpha n_Y)} < 0$

Note that the above proof was implicitly assuming in the CU tariff the expression for the case of not very asymmetric market sizes, if the market sizes are very asymmetric then the proof is straightforward as the exports of Z to the country with smaller market size is zero in CU while the rest of the proof is analogous. □

6 Multilateral Cooperation

There are several ways that we can follow in assessing the influence of being in a CU on further multilateral cooperation. One of them is by looking at the incentives of the members of the trade agreement to engage in the further liberalisation. And from that perspective the CU is unambiguously reducing the willingness of the members to participate in multilateral liberalisation because, as we have shown, the CU creates rents for the local firms and is more likely to be supported if the political bias of the government is strong. Consequently, the lobby of the firms will be directed against further liberalisation as it will destroy their rents. From the position of such considerations, our findings are supporting those ofLevy (1997) who points that exactly because some groups in society gain disproportionately in an agreement, those groups will try to prevent any arrangement that eliminates these advantages.Saggi (2006); Saggi et al. (2011)also highlight the exclusionary effect of the CU on the rest of the world. Our findings intensify these forces through two channels: first, political bias increases the likelihood of a CU being viable but political bias also makes the CU more exclusionary by having positive effect on tariff increase; second, the CU of countries with significant market size asymmetries boosts the protectionism and exclusionary nature of CU.

Another perspective of assessing the impact of CU on multilateral liberalisation is looking at the change in incentives of the rest of the world to engage in multilateral cooperation with the members of CU. And here the CU can offer help for the cause of multilateral cooperation. Specifically, when the non-member country, or rest of the world, would be the binding constraint for liberalisation in FTA or MFN regime, by facing an exclusionary policy in CU it is more willing to cooperate[5]. Our results suggest further that if a country with small market size that previously would have weak bargaining position creates a CU with a country with much larger market size, the exclusionary tariff that it commits to can serve as a powerful bargaining device.

[5]Ornelas (005c); Saggi (2006)mentions that asymmetries in market size or cost are a source for such situations

7 Conclusion

The Customs Unions, though a rather rare type of preferential trade agreements compared to Free Trade Areas, are no less important for world trade system. And this work put as its goal to understand the causes for formation of CU, particularly, from existing Free Trade Area, analyse and compare the consequences. We also stress on the importance of asymmetries of partner countries on the answers that a study of CU brings as the innate property and requirement of a CU is coordination. With those considerations in mind, our analysis concludes that the market outcomes and welfare properties of CUs and their political viability are very different from that of FTAs. We find that CU is necessarily trade diverting, not only compare to an FTA but also compared to MFN regime. But moreover, the CU must reduce total consumption and consumer surplus but increase the firm profits in member countries compared to a FTA. And the effect is at its peak market sizes of partners are sufficiently asymmetric. The overall welfare consequences are ambiguous for the member countries but the welfare of the rest of the world is necessarily reduced relative to FTA.

The political viability of CU is also in contrast to that of an FTA. While it has been shown that an FTA, if it is politically viable, must also be improving welfare over MFN but at the same time an FTA that improves welfare over MFN regime might be blocked by lobby-driven governments. We show that for CU the relationship is different. Instead, being welfare-enhancing is a sufficient cause for a CU to come on force on top of FTA , the governments will never block it. However, as consumer surplus is always lower in CU relative to FTA, the opposite is likely to be true: that a welfare-reducing CU is formed on top of FTA by governments with strong contributions-based interests. Another intuitive conclusion we observe is that the more similar the profiles of the potential CU member, the more likely that it will be formed - as any costs of coordination are reduced but not gains from internalizing the effect that tariff of one country has on another one. In the limit case of full symmetry of market sizes and number of firms, the CU is always formed. On the other hand, if the countries have sufficiently asymmetric market sizes, the CU tariff is prohibitive for firms from the rest of the world in the country with smaller market size and the CU tariff is the most exclusionary. Such CU can serve as a bargaining device for a country with relatively small market size for multilateral cooperation

Appendix A

Proof of Proposition 4

Proof. The objective of the Customs Union tariff setting body is the sum of the government welfare in each country, assuming that the political bias α is the same in member-countries:

$$\max_t CS_X + (1+\alpha)\Pi_X + CS_Y + (1+\alpha)\Pi_Y$$

The FOC of the objective is:

$Q_X \frac{dQ_X}{dt} + Q_Y \frac{dQ_Y}{dt} + n_Z(q_{XZ} + q_{YZ}) + n_Z(\frac{dq_{XZ}}{dt} + \frac{dq_{YZ}}{dt})t + (1+\alpha)2q_{XX}\frac{dq_{XX}}{dt}(n_X + n_Y) + (1+\alpha)2q_{YY}\frac{dq_{YY}}{dt}(n_X + n_Y) = 0$

Substitute the derivatives:

$\frac{-(Q_X+Q_Y)}{N} + (q_{XZ} + q_{YZ}) + 2\frac{-(1+n_X+n_Y)}{N}t + (1+\alpha)2(q_{XX} + q_{YY})\frac{(n_X+n_Y)}{N} = 0$

Substitute the equilibrium quantities given t:

$\frac{-(\Gamma_X+\Gamma_Y)N+2n_Zt}{N} + (\frac{\Gamma_X-(1+n_X+n_Y)t}{N} + \frac{\Gamma_Y-(1+n_X+n_Y)t}{N}) + 2\frac{-(1+n_X+n_Y)}{N}t + (1+\alpha)2(\frac{\Gamma_X+n_Zt}{N} + \frac{\Gamma_Y+n_Zt}{N})\frac{(n_X+n_Y)}{N} = 0$

Rearrange:

$2(\frac{-(\Gamma_X+\Gamma_Y)/2N+n_Zt}{N}+(\frac{(\Gamma_X+\Gamma_Y)/2-(1+n_X+n_Y)t}{N})+\frac{-(1+n_X+n_Y)}{N}t+(\frac{(\Gamma_X+\Gamma_Y)/2+n_Zt}{N})\frac{(1+\alpha)2(n_X+n_Y)}{N}) = 0$

Now notice that the above FOC is equivalent to that of FOC in MFN regime for a country with market size $\frac{\Gamma_X+\Gamma_Y}{2}$ and number of firms $n_X + n_Y$ and the number of firms in the rest of the world n_Z. That allows us to apply the expression for t_i^{MFN} for appropriate parameter adjustments to obtain the Customs Union tariff:

$t^{CU} = \frac{\Gamma_X+\Gamma_Y}{2}\frac{2(1+\alpha)(n_X+n_Y)+1}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2}$

And the SOC is $\alpha < \frac{1}{2(n_X+n_Y)} + \frac{(n_X+n_Y+1)^2}{(n_X+n_Y)n_Z}$

Now let us look at the total export of the rest of the world Z to the CU:

$q_Z^{CU} = q_{XZ}^{CU} + q_{YZ}^{CU} = \frac{\Gamma_X-(1+n_X+n_Y)t^{CU}}{N+1} + \frac{\Gamma_Y-(1+n_X+n_Y)t^{CU}}{N+1} = \frac{\Gamma_X+\Gamma_Y-2(1+n_X+n_Y)t^{CU}}{N+1} =$

$= \frac{(\Gamma_X+\Gamma_Y)(1-2\alpha n_X-2\alpha n_Y)}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2}$.

The total exports to the CU are positive whenever $\alpha < \frac{1}{2(n_X+n_Y)}$ which implies that the export to at least one of the members of the CU is positive. More precisely, if the condition is satisfied, the export to the member of CU with larger market size is always positive as $q_{iZ}^{CU} > q_{jZ}^{CU}$ if member i has larger market size than j. Thus, if $\alpha < \frac{1}{2(n_X+n_Y)}$ then $-(1+n_X+n_Y)\frac{\Gamma_i+\Gamma_j}{2}\frac{2(1+\alpha)(n_X+n_Y)+1}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} > 0$ where i is country with larger market size$\Gamma_i \geq \Gamma_j$.

However for the exports to both members of CU to be positive we need $q_{jZ} = \Gamma_j - (1 + n_X + n_Y)t^{CU} > 0$ to hold.

Rewrite with t^{CU} from the expression for total export of Z:

$q_{jZ} = \Gamma_j - \frac{\Gamma_X+\Gamma_Y}{2} + \frac{\Gamma_X+\Gamma_Y}{2}(1 + n_X + n_Y)\frac{(1-2\alpha n_X-2\alpha n_Y)(N+1)}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} > 0.$

Thus, $q_{jZ} > 0$ if $\Gamma_j > \frac{\Gamma_X+\Gamma_Y}{2}\frac{-(n_x+n_Y)(1-2\alpha n_X-2\alpha n_Y)n_Z+(n_X+n_Y+1)^2(1+2\alpha n_X+2\alpha n_Y))}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} = \frac{\Gamma_X+\Gamma_Y}{2}m$

where $0 < m \equiv \frac{-(n_x+n_Y)(1-2\alpha n_X-2\alpha n_Y)n_Z+(n_X+n_Y+1)^2(1+2\alpha n_X+2\alpha n_Y))}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} <$

$< \frac{-(n_x+n_Y)(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} < 1$

So now we have established that the export from the rest of the world to the country with smaller market size is positive if its market size is close enough to the average of the market sizes of the CU members.

If, instead, the market sizes are asymmetric enough that $\Gamma_j \leq \frac{\Gamma_X+\Gamma_Y}{2}m$ then the obtained solution of $t^{CU}$is prohibitive for firms from Z and, hence, optimization problem above is not appropriate. As long as the tariff is prohibitive, the consumer surplus in j, tariff revenue in j, profits of firms from X and Y in j become independent of t^{CU}:

$CS_j = \frac{Q_j^2}{2} + TR_j = \frac{1}{2}(\frac{(n_X+n_Y)\Gamma_j}{n_X+n_Y+1})^2 + 0$

$\pi_{jj} = \pi_{ji} = (\frac{\Gamma_j}{n_X+n_Y+1})^2$

To solve for optimal t^{CU} we should solve the altered objective and only if the resulting solution is such that the exports from Z to j are zero, we know that it is equilibrium tariff.

The altered objective is

$\max_t CS_i + (1 + \alpha)(\Pi_{ii} + \Pi_{ij})$

$<=>$

$\max_t CS_i + (1 + \alpha)(n_i\pi_{ii} + n_j\pi_{ij})$

$<=>$

$\max_t CS_i + (1 + \alpha)(n_i + n_j)\pi_{ii}$ as $\pi_{ii} = \pi_{ij} = (\frac{\Gamma_i+n_Zt}{N+1})^2$

That is, the objective is equivalent to optimal MFN tariff problem of a country with $n_X + n_Y$ firms and with n_Z firms in the rest of the world and the solution is:

$t^{CU} = \Gamma_i\frac{2(1+\alpha)(n_X+n_Y)+1}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2}$

Now note that $\Gamma_i\frac{2(1+\alpha)(n_X+n_Y)+1}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2} > \frac{\Gamma_i+\Gamma_j}{2}\frac{2(1+\alpha)(n_X+n_Y)+1}{(1-2\alpha n_X-2\alpha n_Y)n_Z+2(n_X+n_Y+1)^2}$ by the very assumption that i has the larger market size. Thus, the solution of the altered problem also implies zero exports from the rest of the world into j and, thus, is the optimal tariff for sufficiently asymmetric in market sizes countries.

Next we want to show that CU is diverting trade from the rest of the world. That is,$t^{CU} > max\{t_X^{FTA}, t_Y^{FTA}\}$.

As above, let i be the member with larger market size and j - with smaller.

Note then that is countries are not too asymmetric

$t^{CU} = \frac{\Gamma_i+\Gamma_j}{2}\frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} \geq$

$\geq \Gamma_j \frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} > \frac{2(1+\alpha)n_j+1}{(1-2\alpha n_j+2n_i)n_Z+2(n_i+n_j+1)^2} = t_j^{FTA}$

If countries are sufficiently asymmetric then $t^{CU} = \Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2}$ while the rest of the argument rests as it is.

We are left to show that $t^{CU} > t_i^{FTA}$

If the market sizes are not too asymmetric then

$t^{CU} = \frac{\Gamma_i+\Gamma_j}{2}\frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2}$ and $\Gamma_j > (1+n_i+n_j)t^{CU}$

Hence $t^{CU} > \frac{\Gamma_i+(1+n_i+n_i)t^{CU}}{2}\frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} =>$

$t^{CU}\frac{2((1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2)-(1+n_X+n_Y)(2(1+\alpha)(n_i+n_j)+1)}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} >$

$> \Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} =>$

$t^{CU} > \Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{2n_Z+2(1-\alpha)(n_i+n_j)^2+3+(5-2\alpha-4\alpha n_Z)(n_i+n_j)}$

$\Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{2n_Z+2(1-\alpha)(n_i+n_j)^2+3+(5-2\alpha-4\alpha n_Z)(n_i+n_j)} - t_i^{FTA} =$

$= \Gamma_i \frac{(4(\alpha+1)(n_j+\alpha n_i)(n_i+n_j)+6\alpha n_j+4n_j-2n_i-1)(N+1)}{((1-2\alpha n_i+2n_j)n_Z+2(n_i+n_j+1)^2)(2n_Z+2(1-\alpha)(n_i+n_j)^2+3+(5-2\alpha-4\alpha n_Z)(n_i+n_j))} > 0$

Thus, the CU tariff is higher than t_i^{FTA}

If the countries are sufficiently asymmetric then it is straightforward that

$t^{CU} = \Gamma_i \frac{2(1+\alpha)(n_i+n_j)+1}{(1-2\alpha n_i-2\alpha n_j)n_Z+2(n_i+n_j+1)^2} > \Gamma_i \frac{2(1+\alpha)n_i+1}{(1-2\alpha n_i+2n_j)n_Z+2(n_i+n_j+1)^2}$

Putting together the relations obtained above provides the result. □

References

Bagwell, K. and Staiger, R. (1999). Regionalism and multilateral tariff cooperation. *International Trade Policy and the Pacific Rim, ed. J Piggott, A Woodland*, 40:157–185.

Bandyopadhyay, S. and Wall, H. (1999). Customs union or free trade area? the role of political asymmetries. *Review of International Economics*, 7(4):665–672.

Brander, J. and Krugman, P. (1983). A reciprocal dumping model of international trade. *Journal of International Economics*, 15(3-4):313–321.

Cadot, O., De Melo, J., and Olarreaga, M. (1999). Regional integration and lobbying for tariffs against nonmembers. *International Economic Review*, 40(3):635–658.

Freund, C. and Ornelas, E. (2010). *Regional trade agreements*. World Bank.

Grossman, G. and Helpman, E. (1995). The politics of free-trade agreements. *The American Economic Review*, 85(4):667–690.

Kennan, J. and Riezman, R. (1990). Optimal tariff equilibria with customs unions. *Canadian Journal of Economics*, 23:70–83.

Krishna, P. (1998). Regionalism and multilateralism: A political economy approach. *Quarterly Journal of Economics*, 113(1):227–250.

Krishna, P. (2005b). Preferential trade agreements and the world trade system: A multilateralist view. *NBER Working Papers 17840,National Bureau of Economic Research, Inc*, 120:1475–506.

Krueger, A. (1997). Free trade agreements versus customs unions. *Journal of Development Economics*, 54(1):169–187.

Levy, P. (1997). A political-economic analysis of free-trade agreements. *The American Economic Review*, pages 506–519.

Ornelas, E. (2005a). Trade creating free trade areas and the undermining of multilateralism. *European Economic Review*, 49:1717–35.

Ornelas, E. (2005b). Rent destruction and the political viability of free trade agreements. *Quarterly Journal of Economics*, 120:1475–506.

Ornelas, E. (2005c). Endogenous free trade agreements and the multilateral trading system. *Journal of International Economics*, 67:471–97.

Ornelas, E. (2007). Exchanging market access at the outsiders' expense: the case of customs unions. *Canadian Journal of Economic*, 40:207–24.

Panagariya, A. and Findlay, R. (1994). A political–economy analysis of free trade areas and customs unions. *World Bank Research Paper WPS 1261.*

Saggi, K. (2006). Preferential trade agreements and multilateral tariff cooperation. *International Economic Review*, 47:29–58.

Saggi, K., Woodland, A., and Yildiz, H. M. (2011). On the relationship between preferential and multilateral trade liberalization: The case of customs unions. *Working Papers 1116, Department of Economics, Vanderbilt University.*

Saggi, K. and Yildiz, H. M. (2010). Bilateralism, multilateralism, and the quest for global free trade. *Journal of International Economics*, 81:26–37.