Mutual Protectionism

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When do countries form customs unions rather than free trade areas? Under both agreements, internal tariff barriers are eliminated, but in a customs union countries delegate setting a common external tariff to a supergovernmental organisation while in an FTA each country retains sovereignty over tariffs . In a model of intra-industry trade with imperfect competition and endogenous tariff-setting, we ask when a CU or FTA can be politically supported and assess the impact on tariffs, consumers, producers and social welfare both in member countries and the rest of the world. Our key result is that when production is asymmetric, customs unions facilitate "mutual protectionism" - each member accepts higher tariffs that benefits primarily the partner countries on some goods in return for similar protection benefiting domestic interests for others. The underlying rationale is that the tariff shifts profits from foreign producers to domestic interests. But in a free trade area, due to lack of commitment on tariffs, such a policy is not sustainable. Mutual protectionism may increase welfare in the customs union but reduces third-country and global welfare. Subsequent to an FTA being formed, each partner country lowers external tariffs and further improving global welfare; but a customs union has the opposite effect, precisely due to mutual protectionism. (JEL F55, F15)

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1 Introduction

We propose to develop a model of endogenous trade bloc formation and tariff setting using a new political economy approach. 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. Finally, we consider the possibility that each country unilaterally sets tariffs. We allow for arbitrary weighing of the consumer welfare and producer profits by the government

As in Grossman and Helpman (1995), governments are driven by conflicting influences in which producers may play a disproportionate role. In our framework, we also allow for international tariff negotiation in CU. Krishna (1998), like we, uses the imperfect–competition international trade approach developed in Brander and Krugman (1983), in a setting where producer interests are paramount but considers a model with only a single good. It is then asked under which conditions a package of trade liberalisation can be accepted politically, holding external tariffs fixed; Krishna finds trade–diverting agreements to be the most politically viable. Krueger (1997) argues that rules of origin in FTA lead to more lobbying potential than in CU, and hence FTA "Pareto dominates". In these and related papers, tariff setting is exogenous and it is variously assumed that tariffs remain constant or that any common external tariffs are an average of previous national tariffs.

With endogenous tariff setting, this assumption need not hold. As we show, mutual protectionism is likely to arise in our setting and leads to systematically higher (external) tariff rates in a customs union vis-a-vis FTA or absence of any agreement.

To the best of our knowledge, this effect is not captured in the existing literature on endogenous tariff setting. Panagariya and Findlay (1994) for example consider tariff setting under lobbying in a customs union, but argue that a free–rider effect – as more lobbyists target a single tariff authority in CU – leads to reduced CETs. 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.

2 Research Highlights

- *Key Methodological Contribution*: The political economy literature on preferential trading agreements often does not distinguish customs unions and free trade areas. We see FTA vs. CU as an essential explanatory factor of trade policy.
- When states producing unrelated or complementary goods form a customs union, the potential for *mutual protectionism* arises. External tariffs for all goods produced in the CU are high, and this can be supported politically because each country agrees to grant protection to the (inefficient) producers in the partner countries in return for protection there.
- Because member countries cannot commit to an external tariff in a free trade area, such an agreement leaves no scope for mutual protectionism.
- Mutual protectionism is more likely to arise when producers have disproportionate political influence in the (potential) CU member states
- Mutually protectionist CUs are most likely to form between countries that are inefficient compared to the rest of the world
- The intensity of mutual protectionism depends on the institutions that determine the common external tariff

3 Related Literature

Grossman and Helpman (1995) is the seminal paper on political economy of trade agreements. They use a framework of perfect competition but sector–specific factor inputs required for production; rents accrue to factor owners that are potentially under threat of trade liberalisation. The government maximises a weighed sum of policy–contingent lobby contributions and social welfare, and has as policy variable the possibility of forming an FTA with a partner country. It FTAs providing enhanced protection are more likely to be supported politically, because they create rather than destroy rents for factor owners. Since a constant external tariff is imposed by assumption, the authors cannot distinguish free trade areas and customs unions in their model. Levy (1997) uses a similar framework to assess the impact of "regional" trade agreements on the possibility of further trade liberalisation.

Krishna (1998) uses a model of imperfect competition to study the political feasibility of FTAs. The government is captured by national producer interests, i.e. maximises domestic profits. Initially, trade between all countries is subject to a fixed specific tax. An exogenous proposal then arrives to create an FTA between two countries. Krishna shows that governments are more likely to ratify such an agreement if it is trade–diverting, i.e. producers in each country gain scale in partner's market but face little increased competition in their own market. He shows that further trade liberalisation becomes difficult after an FTA has been established since trade–creation becomes more likely than diversion.

The central insight of this literature is that trade agreements are most likely to be supported precisely when they are welfare–reducing, and a range of complementary mechanisms through which this can occur are established. However, by assuming that tariff rates are exogenous, a central policy variable is effectively excluded from the analysis; thus the literature also does not distinguish between customs unions and free trade areas.

An important exception is Panagariya and Findlay (1994), where 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. But quantitatively, free–rider effects are often small; and, more importantly, the approach ignores the new possibilities for mutual protectionism created by customs unions.

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), which 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. Since ROOs do not apply in a CU, her result is established. However, as in the previous papers we reviewed, the analysis crucially rests on the assumption that the (exogenous) external tariff of the customs union is an average of previous tariff levels so that effective protection levels do not rise. But, in our framework tariff setting is endogenous, and external tariffs rise in many cases when CU is formed.

The main point of contribution of our paper thus lies in a more realistic specification of the government policy process. By recognising that states retain sovereignty over tariff policy, except when joining a customs union, we capture the essential difference between FTA and CU. This has important implications when production is geographically concentrated:

because raising tariffs on goods a country is importing has welfare costs, this is unlikely to occur in an FTA. But in CU, the joint tariff policy makes bargains of mutual protection possible.

4 Methodology

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. As detailed below, governments in each country seek to pursue national producer interests and agreements are feasible only in so far as they do not reduce profits.

In this framework, we consider both "regional" 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, given that a CU has been established, how the design of tariff–setting institutions affects policy. The timing of the model is summarised in figure 4.1.

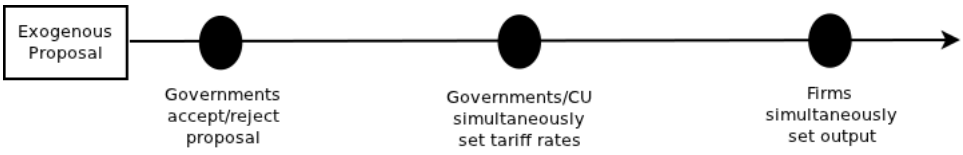

Figure 4.1: Timing of the Model

There are two homogeneous goods, A and B, that are traded in a Cournot market, and a numeraire good C. In each country $i = X, Y, Z$ and sector $k = A, B, C$ there are n_i^k single–product firms. The number of firms is exogenously determined. By assumption, the production of C is competitive, which requires $n_i^C \to \infty$ for all i. Since we are interested in the impact of asymmetric production structures on the formation and development of preferential trade agreements, we leave open the possibility that $n_i^k = 0$ for some countries in the other sectors.

There is no fixed cost but firms incur a constant marginal cost c per unit produced. In the oligopolistic sectors, a country–fixed cost increment $\theta_i \geq 0$ applies. One may loosely interpret A and B as high–tech sectors in which cost depends on national policy (reflected

by θ_i), while sector C is competitive precisely because it is low–tech and costs are more or less equal worldwide.

Firms may separately determine the quantity they supply to each country, so let q_{ij}^k denote the quantity a firm based in country j and producing in sector k sells to country i. The importing country i may levy a per–unit tariff t_{ij}^k on imports of good k 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

$$C_{ij}^k(q_{i,j}^k) = (c + \theta_j + t_{ij}^k)q_{ij}^k \tag{4.1}$$

Consumer preferences are linear–quadratic. The utility of consumption in sectors A and B is scaled by a country parameter Γ_i that reflects the market size:

$$U_i(Q_i^A, Q_i^B, Q_i^C) = Q_i^C + (\Gamma_i Q_i^A - \frac{{Q_i^A}^2}{2}) + (\Gamma_i Q_i^B - \frac{Q_i^{B2}}{2}) \tag{4.2}$$

We moreover assume that the budget constraint does not bind on the demand of A, B, so that income effects can be neglected.

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

$$CS_i = \Gamma_i Q_i^A - \frac{(Q_i^A)^2}{2} \underbrace{- P_i^A Q_i^A + TR_i^A + M_i}_{Q_i^C} \tag{4.3}$$

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

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

$$max\, \alpha CS_i + (1 - \alpha)\Pi_i$$

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 $\alpha \in (0, 1)$ and $1 - \alpha$ is the weight that the government puts on the consumer surplus and producer profits, respectively. Helpman (1995) provides an interesting analysis and discussion on the interpretation and consequences of different α values on the government trade policy. Note that the presence of α is relevant for the trade policy only for the good the good produced locally as in the lack of the domestic firms otherwise, the government's goal is to maximize the consumer surplus.

For example, when $\alpha = 0,5$ the government is maximizing the social welfare.

An $\alpha < 0,5$ would follow the new political economy approach, in that case we understand that the government is motivated by rent–seeking rather than purely benevolent. We shall not try to model explicitly the lobbying process in each country, but capture the essential feature that producers weigh more heavily here than consumers. If α is very close to 0, the government preferences could be approximated by are lexicographic preferences of producer profits over consumer surplus. Thus trade reform that benefits consumers can be implemented, but only so long as it does not hurt producers.

If $\alpha > 0,5$ the government puts higher weight on the consumer surplus. To give more interpretation to that case we follow Helpman (1995) in admitting that the consumers are homogeneous except for their ownership of the firm and, moreover, as it is the case in reality, the ownership is concentrated. Hence, if we order the consumers by their ownership, the median consumer owns zero shares of the firms. Hence, the government that is purely maximising the median voters preferences, would have $\alpha = 1$.

We consider two possible institutional arrangements for the determination of the external tariff. Under *unanimity*, a set of external tariff rates must be acceptable to all heads of state; this in turn means that producer profits may not fall in any single state. This captures the essence of tariff determination in RBKCU and e.g. MERCOSUR. In contrast, under *unitarism*, a supra–governmental body is formed that has authority over tariff negotiations; policy changes are then acceptable if producer profits in the CU as a whole do not decline. This is close to the Treaty of Rome CET institutions of the European Union.

4.1 Market Outcomes

We provide a preliminary analysis of a simple case of the model. The key simplifying assumption concerns the structure of production, in that we will assume that the firms from country X produce good A but not good B and the contrary for country Y. The country Z produces both goods. That is, the potential partner countries are not competing in the market for the goods A and B. The simplifying assumption allows to concentrate on the case of asymmetric, or complementary, production profiles and following consequences.

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 4.2 subject to the budget constraint $Q_i^C + p_i^A Q_i^A + p_i^B Q_i^B = M_i$. As discussed above, income is sufficiently large that

the constraint does not bind on demand for goods A and B. We thus have demand functions

$$\begin{aligned} p_i^{*A}(Q_i^A) &= \Gamma_i - Q_i^A \\ p_i^{*B}(Q_i^B) &= \Gamma_i - Q_i^B \end{aligned}$$

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

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

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

$$q_{ij}^{*k} = max(0, \frac{\Gamma_i - c}{(\sum n_j^K + 1)} - \theta_j^K - t_{ij}^K + \frac{\sum(n_j^K \theta_j^K) + \sum(n_j^K t_{ij}^K)}{(\sum n_j^K + 1)}) \tag{4.4}$$

$$\pi_{ij}^{*k} = (q_{ij}^{*k})^2 \tag{4.5}$$

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 k, we find the equilibrium market output Q_i^k in terms of parameters to be

$$Q_i^k = \frac{(\sum n_j^K)(\Gamma_i - c) - \sum(n_j^K \theta_j^K) - \sum(n_j^K t_{ij}^K)}{(\sum n_j^K + 1)} \tag{4.6}$$

5 Government Policy

In this section we consider the trade policy adopted by the countries under different trade regimes. The baseline case considers unilateral decision-making of the countries subject to MFN clause only. Then the trade policy within a FTA and CU is considered and welfare results are discussed.

5.1 Unilateral Trade Policy

We now solve the government's problem under a unilateral trade policy, without any PTA. For illustrative purposes, our focus shall be on countries X and Y only. Because non–discriminatory principles apply, $t_{ij}^k = t_{im}^k$ for all k and $j, m = X, Y, Z \backslash i$ and $m \neq j$.

The appropriate version of government policy on the tariff for good $k = A, B$ from equation 4.4 and 4.5 is then

$$\max_{t^k} \alpha(\Gamma_i Q_i^k - \frac{(Q_i^k)^2}{2} \underbrace{- P_i^k Q_i^k + TR_i^k + M_i)}_{Q_i^C} + (1-\alpha)\pi_i^k$$

Further, we denote q_{ii}^k - quantity of good k produced by a local firm and use price function expression to rewrite the objective as:

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

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

In words, 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.

For illustrative purposes, hereinafter our focus shall be on country X as the home country and Y, Z - foreign.

We first look at the tariff choice of the government for the good A, the good that is produced in X and Z.

Proposition 1. *The objective function of the government is concave and the first order condition is sufficient if* $\alpha > \bar{\alpha}^{UP} = \frac{2n_X n_Z}{(4n_X+1)n_Z+2(n_X+1)^2} < 1/2$*, and the optimal tariff or good* A *imported from* Z *to* X *is given by:*

$$t_{XZ}^{A,UP} = \frac{\Gamma_X((2-\alpha)n_X + \alpha)}{((4\alpha-2)n_X + \alpha)n_Z + 2\alpha(n_X+1)^2}$$

For low levels of $\alpha < \bar{\alpha}$ *derivative is positive as long as higher tariffs reduce foreign imports, so that only the prohibitive tariff, which excludes all importers from the domestic market, is optimal*

$$t_{XZ}^{A,UP} = \frac{\Gamma_X}{1+n_X}, \alpha < \bar{\alpha}_{NP}$$

Proof. The result is obtained by determining the concavity conditions of the government objective and then solving for FOC and by finding the prohibitive tariff level through equating imports to zero for the case where objective of the government is convex.

First, we check whether there is a range of parameters where the solution leads to non-zero production by the firms of both countries. In such case, the government's objective would be:

$$\alpha(\frac{((n_X+n_Z)\Gamma_X - n_Z t_{XZ}^A)^2}{2(n_X+n_Z+1)^2} + n_Z\frac{\Gamma_X-(1+n_X)t_{XZ}^A}{n_X+n_Z+1}t_{XZ}^A) + (1-\alpha)n_X(\frac{\Gamma_X+n_Z t_{XZ}^A}{n_X+n_Z+1})^2$$

The objective is quadratic in t_{XZ}^A, and is concave whenever: $\alpha > \bar{\alpha}^{UP} \equiv \frac{2n_X n_Z}{(4n_X+1)n_Z+2(n_X+1)^2}$

Thus, the FOC provide the global maximum of the function:

$$t_{XZ}^* = \frac{\Gamma_X((2-\alpha)n_X+\alpha)}{((4\alpha-2)n_X+\alpha)n_Z+2\alpha(n_X+1)^2}$$

Note that $0 < t_{XZ}^* < \frac{\Gamma_X}{1+n_X}$ which means that production of firms from both countries is positive for $\bar{\alpha}^{UP} < \alpha$.

Now, we check if there is a range of parameters when only local firms produce in X. In that case, the government's objective is:

$$\alpha\frac{((n_X+n_Z)\Gamma_X - n_Z t_{XZ}^A)^2}{2(n_X+n_Z+1)^2} + (1-\alpha)n_X(\frac{\Gamma_X+n_Z t_{XZ}^A}{n_X+n_Z+1})^2$$

The objective is always convex and is maximised at one of the border cases. This comparison leads to

$$G_X(t_{ZX}^A = \frac{\Gamma_X}{1+n_X}) > G_X(t_{ZX}^A = 0)$$

<=>

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

Or, $\alpha < \frac{2n_X n_Z+4n_X(n_X+1)}{(4n_X+1)n_Z+6n_X(n_X+1)} = \frac{1}{2+\frac{n_Z-2n_X(n_X+1)}{2n_X n_Z+4n_X(n_X+1)}}$. For these values the right border, or

prohibitive tariff, is maximising the objective of the government.

And as we know from above for any $\alpha < \bar{\alpha}^{UP} = \frac{1}{2+\frac{n_Z+2(n_X+1)^2}{2n_X n_Z}}$ the objective of the government is convex, and as $\frac{1}{2+\frac{n_Z+2(n_X+1)^2}{2n_X n_Z}} < \frac{1}{2+\frac{n_Z-2n_X(n_X+1)}{2n_X n_Z+4n_X(n_X+1)}}$,we conclude that for any $\alpha < \frac{1}{2+\frac{n_Z+2(n_X+1)^2}{2n_X n_Z}}$ the objective is maximised at $t^A_{ZX} = \frac{\Gamma_X}{1+n_X}$. □

Properties:

1. Note that the optimal tariff is first strictly and later weakly decreasing in α, that is a very intuitive result that more the government is protecting the home producers compared with the consumer surplus, higher will be the tariff.

2. The optimal tariff is decreasing in the number of firms in the home country

3. The optimal tariff is decreasing in the number of firms of the foreign country

Now, let us look at the tariff set by X on the import of good B. Good be is not produced in X and, hence, it is fully imported and there are no home producers to protect interests of.

Proposition 2. *The X government's objective when setting tariff on good B is concave for all feasible parameter values, and the optimal interior solution is:*

$$t^{B,NP}_{Xj} = \frac{\Gamma_X}{(n_Y + n_Z + 2)}$$

where $j = Y, Z$

Proof. In this case the government's objective coincides with consumer surplus. Note we assume the tariff revenue is returned to consumers. Since it will be spent on the competitive good (lack of income effects on goods A and B), consumer surplus is given by – again considering country X:

$$CW^B = (\Gamma_X Q^B_X - \frac{(Q^B_X)^2}{2}) - (\Gamma_X - Q^B_X)Q^B_X + Q^B_X t_{Xj}$$

$$\frac{((n_Y + n_Z)\Gamma_X - (n_Y + n_Z)t^B_{XZ})^2}{2(n_Y + n_Z + 1)^2} + \frac{(n_Z + n_Y)(\Gamma_X - t^B_{XZ})}{n_Y + n_Z + 1} t^B_{XZ}$$

The function is always concave as the coefficient of the quadratic term is negative:

$$\frac{(n_Y + n_Z)^2 - 2(n_Y + n_Z + 1)(n_Z + n_Y)}{2(n_X + n_Z + 1)^2} < 0$$

Solving then for the FOC leads to the stated optimal tariff. □

5.2 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 $t^k_{XY} = t^k_{YX} = 0$ for all k. What remains is for each country to set the external tariff unilaterally.

First observe that the optimal tariff for the domestically produced good does not change as it is not produced in the FTA partner country. This is easily seen from the fact that the tariff rates between X and Y do not appear in the expression of the government's objective for that good. That also holds on the assumption of Rules of Origin being present.Tariff set by country X on importing goods A and B from country Z maximizing weighed sum of consumer surplus and producer profits is:

Proposition 3. *In the FTA the tariff rate of X for good A(locally produced) for firms from Z is - unchanged $t^{A,NP}_{XZ} = t^{A,FTA}_{XZ}$*

$$t^{A,FTA}_{XZ} = \frac{\Gamma_X((2-2\alpha)n_X+\alpha)}{((4\alpha-2)n_X+\alpha)n_Z+2\alpha(n_X+1)^2}, \alpha \geq \bar{\alpha}_{FTA}$$
$$t^{A,FTA}_{XZ} = \frac{\Gamma_X}{n_X+1}, \alpha < \bar{\alpha}_{FTA}\text{-}prohibitive\ tariff$$

The outcome is different for the good B (not produced locally)

$$t^{B,FTA}_{XZ} = \frac{\Gamma_X}{(2n_Y+1)n_Z+2(n_Y+1)^2}$$

Proof. Notice that as country Y does not produce good A, no firms from Y were entering in the objective of the X government in the unilateral decision making. Clearly, after the tariffs between X and Y are zero after forming the FTA, the situation does not change: Y still does not produce good A and, hence, the objective of government of X is unaltered.

Instead, good B is produced in Y and the firms from Y were entering the objective of the X and paying the import tariff. Now, in FTA they are exempted from tariff. Thus, the objective of the X government changed and now only firm from X and Z enter its objective:

$$G^B_{FTA} = CW^B_{FTA} = \frac{(Q^B_X)^2}{2} + n_Z q^B_{XZ} t_{Xj}$$

$$\frac{((n_Y+n_Z)\Gamma_X - n_Z t^B_{XZ})^2}{2(n_Y+n_Z+1)^2} + \frac{(n_Z+n_Y)\Gamma_X - (1+n_Y)t^B_{XZ})}{n_Y+n_Z+1} t^B_{XZ}$$

It can be verified that this function is concave so first order condition is sufficient. Solving for FOC gives the required result. □

One can see the interesting outcome that forming an FTA leads to a decrease of the import tariff rate the countries set for the good they do not produce compared to the unilateral trade policy. The abolishment of the tariffs between X and Y created a comparative advantage for firms from Y and the supply of a good not produced locally from the partner country, ceteris paribus, has increased while the supply from Z has decreased. As well as tariff revenues, as in FTA they come only from firms from Z, and even they, ceteris paribus, decrease due to lower import from Z. To compensate for these ceteris paribus effects of FTA, the optimal tariff rate for firms from Z is lower than before in order to increase the total output and the tariff revenue. There are also changes in the tariff revenue: now the income from tariffs is coming only from the imports from Z.

The tariff on the good that is produced locally doesn't change under FTA, and the government's objective in the good not produced locally is social welfare and coincides with consumer surplus, hence, whenever FTA satisfies participation constraint of the government, it is improving consumer surplus.

5.3 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:

$$maxG_X + G_Y$$

$$\max_{t^K} \alpha CS_X^K + (1-\alpha)\Pi_X^K + \alpha CS_Y^K + (1-\alpha)\Pi_Y^K$$

Solving the objective separately for the goods A and B as the sectors are independent, the resulting import tariffs are:

Proposition 4. *Tariff set by country X on importing goods A and B from country Z maximizing weighed sum of consumer surplus and producer profits is, $i = X, Y$:*

Good A

$$t_{iZ}^{A,CU} = \frac{\Gamma_X+\Gamma_Y}{2}\frac{(2-2\alpha)n_X+\alpha}{((4\alpha-2)n_X+\alpha)n_Z+2\alpha(n_X+1)^2}, \alpha \geq \bar{\alpha}_{CU}$$
$$t_{iZ}^{A,CU} = \frac{\Gamma_X+\Gamma_Y}{2(n_X^A+1)}, \alpha < \bar{\alpha}_{CU}^A \text{ - } \textit{prohibitive tariff}$$

Good B

$$t_{iZ}^{B,CU} = \frac{\Gamma_X+\Gamma_Y}{2}\frac{(2-2\alpha)n_Y+\alpha}{((4\alpha-2)n_Y+\alpha)n_Z+2\alpha(n_Y+1)^2}, \alpha \geq \bar{\alpha}_{CU}^{B}$$
$$t_{iZ}^{B,CU} = \frac{\Gamma_X+\Gamma_Y}{2(n_Y^A+1)}, \alpha < \bar{\alpha}_{CU} \text{- } \textit{prohibitive tariff}$$

Proof. The common tariff is set to maximise the weighted sum of the welfare in the countries where the weight is the same as the individual governments use. Given the tariff, the price in each country is determined independently, as well as the market outcome. The solution method similar to that of Proposition 1 then leads to the result. □

The main difference from the previous cases is that now profits of the firms from X in Y as well as profits of firms from Y selling 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.

The resulting trade policy of the CU depends on the weights each government attributes to the consumer surplus. Note that in the unilateral and FTA cases the government's objective was coinciding with the consumer surplus and social welfare for the non-produced good. In the CU, however, both goods A and B are being produced. That leads to the main difference of the CU from the FTA: now the total firms profits are considered in both countries of the CU. That is, the profits of the firms from country X from sales in country Y are considered when determining the tariff on good A. Similarly, with the profits of the firms form Y selling the good B in X: the enter the objective function for determining the tariff on good B. That feature of tariff determination is the *mutual protectionism* of the CU vis–a–vis FTA.

Note that social welfare maximizing tariff rates are higher than the ones maximizing consumer surplus. Hence, in the case when the governments are social welfare maximizers or are biased towards producer profits, the associated with forming the CU increase in the tariff rate is detrimental to consumer surplus.

An alternative approach to tariff setting in the CU would be a Nash bargaining solution which we are interested to look at as well. Our conjecture is that the mutual protectionism rises under that tariff setting approach as well.

6 Equilibrium Trade Flows

6.1 Trade Flows in Unilateral Trade Policy

First, we look at the export of the rest of the world Z to X of good A:

$$I^A_{XZ} = n_Z max(0, \frac{\Gamma_X - (1+n_X)t^A_{XZ}}{n_X + n_Z + 1})$$

We plug in the optimal tariff to determine the trade flow:

$$I^A_{XZ} = \frac{\Gamma_X((4\alpha-2)n_X + \alpha)n_Z}{((4\alpha-2)n_X + \alpha)n_Z + 2\alpha(n_X+1)^2}$$

If the government is social welfare maximiser ($\alpha = 0.5$) then the expression becomes:

$$I^A_{XZ} = \frac{n_Z\Gamma_X}{n_Z + 2(n_X+1)^2}$$

The equilibrium production in X of the good A is obtained in similar manner:

$$I^A_{XX} = n_X max(0, \frac{\Gamma_X + n_Z t^A_{XZ}}{n_X + n_Z + 1})$$

Plug in the optimal value of t^A_{XZ}:

$$I^A_{XX} = n_X \frac{\Gamma_X 2\alpha(n_X+1)}{((4\alpha-2)n_X + \alpha)n_Z + 2\alpha(n_X+1)^2}$$

Now we look at trade in good B for country X. The import of good B from country Y is:

$$I_{XY} = n_Y max(0, \frac{\Gamma_X - (1+n_Z)t^B_{XY} + n^B_Z t^B_{ZY}}{n_Y + n_Z + 1})$$

The equilibrium import is:

$$I^B_{XY} = n_Y \frac{\Gamma_X}{n^B_Y + n^B_Z + 2}$$

Similarly we obtain the import of the good B from the rest of the world:

$$I^B_{XZ} = n_Z \frac{\Gamma_X}{n^B_Y + n^B_Z + 2}$$

6.2 Trade flows in Free Trade Area

We again look at the trade flows of country X. Notice, as the tariff level for good A did not change and that good is not produced in partner country, hence, the import from the rest of the world and home production of the good do not change.

Instead, to determine the change in the trade flows of good B we plug in the new tariff level.

The import of the good from partner country is:

$$I_{XY}^{B} = \frac{\Gamma_X 2(n_Y+1)n_Y}{(2n_Y+1)n_Z + 2(n_Y+1)^2}$$

The export of good B of country Y to X is unambiguously larger as it now does not pay the tariff while the rest of the world does. the The export $I_{XY}^{B,FTA}$ increases with the number of firms in Y but decreases with the number of firms in the rest of the world (like the export in the Unilateral policy).

Moreover, the difference between its export in FTA and Unilateral policy increases with the number of firms in Y and in the rest of the world.

The rest of the world exports B to X the following amount:

$$I_{XZ}^{B} = \frac{\Gamma_X (2n_Y+1)n_z}{(2n_Y+1)n_Z + 2(n_Y+1)^2}$$

Very interestingly, also the export of the rest of the world of good B to X is larger in FTA $\frac{\Gamma_X n_z}{n_Z+n_Y+(3n_Y+2)/(2n_Y+1)}$ than under Unilateral policy. As expected, it is increasing in the number of firms in the rest of the world and decreasing in number of firms in country Y.

Thus, the FTA has overall liberaisation effect by boosting trade among all countries.

6.3 Trade flows in Customs Union

Now we look at the trade flows taking place in the a customs union.

First we look at the total export from the rest of the world to the countries of CU of good A:

$$I_{XZ}^{A} + I_{YZ}^{A} = n_Z \frac{\Gamma_X + \Gamma_Y - 2(1+n_X)t_{XZ}^{A,CU}}{n_X + n_Z + 1}$$

$$I_{XZ}^{A} + I_{YZ}^{A} = \frac{(\Gamma_X + \Gamma_Y)((4\alpha-2)n_X + \alpha)n_Z}{((4\alpha-2)n_X + \alpha)n_Z + 2\alpha(n_X+1)^2}$$

Similarly we find the production of the good A within the CU as a sum of home-production and intra-CU trade:

$$I^A_{XX} + I^A_{YX} = n_X \frac{(\Gamma_X + \Gamma_Y)2\alpha(n_X + 1)}{((4\alpha - 2)n_X + \alpha)n_Z + 2\alpha(n_X + 1)^2}$$

Next, let's determine the export of the rest of the world to CU of the good B:

$$I^B_{XZ} + I^B_{YZ} = n_Z \frac{\Gamma_X + \Gamma_Y - (1 + n_Y)t^{A,CU}_{YZ}}{n_X + n_Z + 1})$$

$$I^B_{XZ} + I^B_{YZ} = \frac{(\Gamma_X + \Gamma_Y)((4\alpha - 2)n_Y + \alpha)n_Z}{((4\alpha - 2)n_Y + \alpha)n_Z + 2\alpha(n_Y + 1)^2}$$

The export of both goods of the rest of the world to the partner countries is unambiguously lower in the CU than in the FTA.

And the production of the good B within the CU:

$$I^B_{YY} + I^B_{XY} = n_Y \frac{(\Gamma_X + \Gamma_Y)2\alpha(n_Y + 1)}{((4\alpha - 2)n_Y + \alpha)n_Z + 2\alpha(n_Y + 1)^2}$$

7 Ratification of Trade Agreement[1]

This sections examines when each of the PTAs - satisfies the participation constraints of the participants and assesses the social welfare of politically feasible regimes.

The governments will be able to form either of the PTA whenever the losses due to tariff setting constraints are compensated by the gains through easier access to the partner market.

First we look at the the conditions for feasibility of FTA compared to status quo. A FTA is feasible if the profit gains in the partner country outweigh the loss from not being able to set a non-zero tariff on the partner country imports:

$$(1-\alpha)(\underbrace{\Pi^{A,FTA}_{YX} - \Pi^{A,UP}_{YX}}_{>0}) \geq \alpha(\underbrace{CS^{B,UP}_X - CS^{B,FTA}_X}_{>0 \Leftarrow \Gamma_X < \Gamma_Y})$$

$$\frac{(1-\alpha)\Gamma_Y^2 n_X(n_Z+2n_X+2)(2(2n_X+1)n_Z+4(n_X^2+1)^2+n_Z+2(n_X+1))}{(n_Z+n_X+2)^2((2n_X+1)n_Z+2(n_X+1)^2)} \geq \frac{\alpha\Gamma_X^2 n_y}{(n_Z+n_y+2)((2n_Y+1)n_Z+2(n_Y+1)^2))}$$

Proposition 5. *Let $\Gamma_X = \Gamma_Y$ and $n_X = n_Y$ then the FTA is feasible*

Proof. If $\Gamma_X = \Gamma_Y$ and $n_X = n_Y$ then the condition above reduces to the following inequality:

[1] Preliminary

$(1-\alpha)(n_Z+2n_X+2)(2(2n_X+1)n_Z+4(n_X^2+1)^2+n_Z+2(n_X+1)) \geq \alpha(n_Z+n_X+2)((2n_X+1)n_Z+2(n_X+1)^2)$

which leads to $\frac{1-\alpha}{\alpha} \geq \frac{(n_Z+n_X+2)((2n_X+1)n_Z+2(n_X+1)^2)}{(n_Z+2n_X+2)(2(2n_X+1)n_Z+4(n_X^2+1)^2+n_Z+2(n_X+1))}$

$\alpha < \frac{(4n_X+3)n_Z^2+4(3n_Z+2n_X+3)(n_X+1)^2}{(6n_X+4)n_Z^2+n_Xn_Z+4(2.5n_X+4n_Z+4)(n_X+1)^2} > 0.5$ □

8 Conclusions

The paper demonstrates an effect that can endogenously lead to higher external tariffs in a customs union vis-a-vis free trade areas or unilateral policy when production structures are asymmetric. We investigate trade policy in a customs union through the lens of strategic delegation. Our main contribution here is the mutual protectionism effect: each member country receives protection for its own industries in the partner countries in return for accepting tariffs that also protect the partners' key industries in its own market; a customs union thus leads to higher external tariffs than a free-trade area and, if the weight on the firm profits is sufficiently high, unilateral policy. Mutual protectionism is most likely to arise when the production structure of the member countries is asymmetric and imperfectly competitive.

As we allow for arbitrary weighing of the consumer surplus and producer profits in the government's objective, it is clear that tariff outcomes depend on the weight. In particular, when median voter concerns determine policy, FTAs are more protectionist than either unilateral policy or CU; when the government maximises producer profits (influence-driven case), the result is reversed and customs unions are more protectionist than FTA or unilateral policy. Under a social-welfare maximising government, FTA tariffs are lower than under national policy, with CU tariffs exceeding FTA level.

9 References

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